WEBVTT

NOTE duration:"02:12:04"

NOTE recognizability:0.819

NOTE language:en-us

NOTE Confidence: 0.732107638

00:00:00.000 --> 00:00:01.185 OK. Obviously we're going to,

NOTE Confidence: 0.732107638

00:00:01.185 --> 00:00:02.694 we're going to record the whole

NOTE Confidence: 0.732107638

00:00:02.694 --> 00:00:03.798 session is being recorded.

NOTE Confidence: 0.732107638

00:00:03.800 --> 00:00:05.848 So you'll get a a copy of the

NOTE Confidence: 0.732107638

00:00:05.848 --> 00:00:07.878 recording when we're all done as well.

NOTE Confidence: 0.732107638

00:00:07.878 --> 00:00:09.473 But right now the the

NOTE Confidence: 0.732107638

00:00:09.473 --> 00:00:10.880 microscopes will be muted.

NOTE Confidence: 0.732107638

00:00:10.880 --> 00:00:12.581 So if there is a question we'll

NOTE Confidence: 0.732107638

00:00:12.581 --> 00:00:13.719 have questions towards the end.

NOTE Confidence: 0.732107638

00:00:13.720 --> 00:00:15.200 You can type them in at any time.

NOTE Confidence: 0.732107638

00:00:15.200 --> 00:00:18.160 I'll try to go through the the questions

NOTE Confidence: 0.732107638

00:00:18.160 --> 00:00:19.780 at the end of the at the end of the

NOTE Confidence: 0.732107638

00:00:19.834 --> 00:00:21.423 session and we'll try to address what

NOTE Confidence: 0.732107638

00:00:21.423 --> 00:00:22.792 we can with the questions there.

NOTE Confidence: 0.732107638

00:00:22.792 --> 00:00:24.837 If I can try to unmute some of you

NOTE Confidence: 0.732107638

00:00:24.837 --> 00:00:26.264 to ask a real question, I can,

NOTE Confidence: 0.732107638

00:00:26.264 --> 00:00:27.800 I can try to do that as well.

NOTE Confidence: 0.732107638

00:00:27.800 --> 00:00:30.064 Or at the very end like.

NOTE Confidence: 0.732107638

00:00:30.064 --> 00:00:31.120 And I said I'll,

NOTE Confidence: 0.732107638

00:00:31.120 --> 00:00:32.690 I'm sharing my e-mail address

NOTE Confidence: 0.732107638

00:00:32.690 --> 00:00:34.668 where you can contact the support

NOTE Confidence: 0.732107638

00:00:34.668 --> 00:00:37.104 team and we can answer your your

NOTE Confidence: 0.732107638

00:00:37.104 --> 00:00:38.320 questions one-on-one directly

NOTE Confidence: 0.732107638

00:00:38.320 --> 00:00:40.570 with it with your own private

NOTE Confidence: 0.732107638

00:00:40.570 --> 00:00:41.972 one-on-one session moving forward.

NOTE Confidence: 0.732107638

00:00:41.972 --> 00:00:42.298 OK.

NOTE Confidence: 0.732107638

00:00:42.298 --> 00:00:44.254 So why don't we just go

NOTE Confidence: 0.732107638

00:00:44.254 --> 00:00:45.718 ahead and get started?

NOTE Confidence: 0.949151348

00:00:49.480 --> 00:00:52.120 So thank you for coming.

NOTE Confidence: 0.949151348

00:00:52.120 --> 00:00:54.178 This is a webinar session to get

NOTE Confidence: 0.949151348

00:00:54.178 --> 00:00:56.136 started with the Morris using the

NOTE Confidence: 0.949151348

00:00:56.136 --> 00:00:57.816 latest version of our software

NOTE Confidence: 0.949151348

00:00:57.816 --> 00:01:00.240 which is currently at version 10.1.

NOTE Confidence: 0.949151348

00:01:00.240 --> 00:01:02.880 My goal here today, my name is,

NOTE Confidence: 0.949151348

00:01:02.880 --> 00:01:03.840 my name is Matthew.

NOTE Confidence: 0.949151348

00:01:03.840 --> 00:01:07.179 My goal here today is to give you a

NOTE Confidence: 0.949151348

00:01:07.179 --> 00:01:09.056 general overall introduction tour Amaris.

NOTE Confidence: 0.949151348

00:01:09.056 --> 00:01:11.300 Now, I'm not going to be able to

NOTE Confidence: 0.949151348

00:01:11.300 --> 00:01:13.034 cover everything in the session today.

NOTE Confidence: 0.949151348

00:01:13.040 --> 00:01:15.014 I'm going to try to talk for

NOTE Confidence: 0.949151348

00:01:15.014 --> 00:01:16.738 about 90 minutes or so to kind of

NOTE Confidence: 0.949151348

00:01:16.738 --> 00:01:18.213 give you an overview of a lot of

NOTE Confidence: 0.949151348

00:01:18.213 --> 00:01:19.277 different features in Amaris.

NOTE Confidence: 0.949151348

00:01:19.280 --> 00:01:20.800 I'm going to walk through some of them.

NOTE Confidence: 0.949151348

00:01:20.800 --> 00:01:22.151 I'm going to kind of just show

NOTE Confidence: 0.949151348

00:01:22.151 --> 00:01:23.199 you the results on others.

NOTE Confidence: 0.949151348

00:01:23.200 --> 00:01:24.600 There's going to be a lot of things

NOTE Confidence: 0.949151348

00:01:24.600 --> 00:01:25.777 that we're going to cover just to

NOTE Confidence: 0.949151348

00:01:25.777 --> 00:01:27.115 kind of give you a general overview

NOTE Confidence: 0.949151348

00:01:27.115 --> 00:01:28.395 of all the different features,

NOTE Confidence: 0.949151348

00:01:28.400 --> 00:01:30.158 all the different types of analysis,

NOTE Confidence: 0.949151348

00:01:30.160 --> 00:01:31.595 most of the most common analysis that

NOTE Confidence: 0.949151348

00:01:31.595 --> 00:01:33.240 you can do with with the software.

NOTE Confidence: 0.949151348

00:01:33.240 --> 00:01:34.338 Now, there's a lot of things

NOTE Confidence: 0.949151348

00:01:34.338 --> 00:01:35.600 I'm not going to cover today.

NOTE Confidence: 0.949151348

00:01:35.600 --> 00:01:39.716 And if there's anything that's in our

NOTE Confidence: 0.949151348

00:01:39.720 --> 00:01:42.114 in our pocketbook of features and

NOTE Confidence: 0.949151348

00:01:42.114 --> 00:01:44.640 modules that we didn't cover today,

NOTE Confidence: 0.949151348

00:01:44.640 --> 00:01:46.520 please reach out to the US support team.

NOTE Confidence: 0.949151348

00:01:46.520 --> 00:01:48.011 The e-mail down here is in the

NOTE Confidence: 0.949151348

00:01:48.011 --> 00:01:49.200 bottom of my signature.

NOTE Confidence: 0.949151348

00:01:49.200 --> 00:01:51.160 This will come to our general support inbox.

NOTE Confidence: 0.949151348

00:01:51.160 --> 00:01:52.470 Depending on where you are

NOTE Confidence: 0.949151348

00:01:52.470 --> 00:01:53.518 and where you're located.

NOTE Confidence: 0.949151348

00:01:53.520 --> 00:01:56.130 I'm your typical primary support support

NOTE Confidence: 0.949151348

00:01:56.130 --> 00:01:58.674 person in the East Coast so I'll

NOTE Confidence: 0.949151348

00:01:58.674 --> 00:01:59.913 probably be the person that'll reach out,

NOTE Confidence: 0.949151348

00:01:59.920 --> 00:02:01.549 but if I'm not around it will go to

NOTE Confidence: 0.949151348

00:02:01.549 --> 00:02:03.141 one of our team members that will

NOTE Confidence: 0.949151348

00:02:03.141 --> 00:02:04.741 assist you and give you the training

NOTE Confidence: 0.949151348

00:02:04.741 --> 00:02:06.490 on your data and and help you with

NOTE Confidence: 0.949151348

00:02:06.490 --> 00:02:08.240 the software as best that we can.

NOTE Confidence: 0.949151348

00:02:08.240 --> 00:02:09.776 Now the format of today is I'm not

NOTE Confidence: 0.949151348

00:02:09.776 --> 00:02:11.558 going to present a whole lot of slides.

NOTE Confidence: 0.949151348

00:02:11.560 --> 00:02:14.365 This is my only slide to just

NOTE Confidence: 0.949151348

00:02:14.365 --> 00:02:16.075 kind of present the title here.

NOTE Confidence: 0.949151348

00:02:16.080 --> 00:02:17.864 What I'm basically going to do is I'm

NOTE Confidence: 0.949151348

00:02:17.864 --> 00:02:19.731 going to walk you through it from start

NOTE Confidence: 0.949151348

00:02:19.731 --> 00:02:21.519 to finish how to use the software.

NOTE Confidence: 0.949151348

00:02:21.520 --> 00:02:24.080 So this is going to be a hands going to

NOTE Confidence: 0.949151348

00:02:24.149 --> 00:02:27.280 be a real time live demo of the software.

NOTE Confidence: 0.949151348

00:02:27.280 --> 00:02:30.230 So I'm going to try to present as best I

NOTE Confidence: 0.949151348

00:02:30.230 --> 00:02:32.280 can as slowly as I can the general features.

NOTE Confidence: 0.949151348

00:02:32.280 --> 00:02:34.512 Not only kind of how to get the data

NOTE Confidence: 0.949151348

00:02:34.512 --> 00:02:36.304 from your raw microscope file into

NOTE Confidence: 0.949151348

00:02:36.304 --> 00:02:38.520 a Mars but then how to analyze,

NOTE Confidence: 0.949151348

00:02:38.520 --> 00:02:38.833 process,

NOTE Confidence: 0.949151348

00:02:38.833 --> 00:02:40.398 create surfaces and export your

NOTE Confidence: 0.949151348

00:02:40.398 --> 00:02:42.160 data as a final product.

NOTE Confidence: 0.949151348

00:02:42.160 --> 00:02:43.520 So it's all going to be kind of hands on.

NOTE Confidence: 0.949151348

00:02:43.520 --> 00:02:45.048 So like I said I'm going to try

NOTE Confidence: 0.949151348

00:02:45.048 --> 00:02:46.974 to go as slow as I can to kind of

NOTE Confidence: 0.949151348

00:02:46.974 --> 00:02:48.279 show you all the features.

NOTE Confidence: 0.949151348

00:02:48.280 --> 00:02:49.757 But again a lot of the stuff

NOTE Confidence: 0.949151348

00:02:49.757 --> 00:02:51.239 is going to be pre created,

NOTE Confidence: 0.949151348

00:02:51.240 --> 00:02:53.958 some of it is going to be brand new.

NOTE Confidence: 0.949151348

00:02:53.960 --> 00:02:55.038 So let me start up a Mars.

NOTE Confidence: 0.949151348

00:02:55.040 --> 00:02:56.876 So when you launch a Mars,

NOTE Confidence: 0.949151348

00:02:56.880 --> 00:02:58.386 the first thing that you're going

NOTE Confidence: 0.949151348

00:02:58.386 --> 00:03:00.325 to see when you launch a Morris

NOTE Confidence: 0.949151348

00:03:00.325 --> 00:03:01.795 is this particular arena view.

NOTE Confidence: 0.949151348

00:03:01.800 --> 00:03:02.934 Now the reason I wanted to kind

NOTE Confidence: 0.949151348

00:03:02.934 --> 00:03:03.420 of start with

NOTE Confidence: 0.818900231666667

00:03:03.464 --> 00:03:04.549 this is because this is

NOTE Confidence: 0.818900231666667

00:03:04.549 --> 00:03:05.200 where everything starts.

NOTE Confidence: 0.818900231666667

00:03:05.200 --> 00:03:07.640 Your data is either in a TIF image,

NOTE Confidence: 0.818900231666667

00:03:07.640 --> 00:03:09.480 it's a Zeiss image, Leica,

NOTE Confidence: 0.818900231666667

00:03:09.480 --> 00:03:11.220 Nikon, some sort of microscope

NOTE Confidence: 0.818900231666667

00:03:11.220 --> 00:03:12.960 format that has some metadata,

NOTE Confidence: 0.818900231666667

00:03:12.960 --> 00:03:14.706 or it's a TIF series that has no metadata

NOTE Confidence: 0.818900231666667

00:03:14.706 --> 00:03:16.278 and you acquired it somewhere else,

NOTE Confidence: 0.818900231666667

00:03:16.280 --> 00:03:17.756 so you converted it from somewhere

NOTE Confidence: 0.818900231666667

00:03:17.756 --> 00:03:19.732 else and it's some sort of TIF series.

NOTE Confidence: 0.818900231666667

00:03:19.732 --> 00:03:21.874 We can handle all of these data

NOTE Confidence: 0.818900231666667

00:03:21.874 --> 00:03:24.040 formats and import them into a Morris.

NOTE Confidence: 0.818900231666667

00:03:24.040 --> 00:03:26.560 A lot of these file formats are

NOTE Confidence: 0.818900231666667

00:03:26.560 --> 00:03:28.033 directly are directly compatible

NOTE Confidence: 0.818900231666667

00:03:28.033 --> 00:03:29.517 with our file converter.

NOTE Confidence: 0.818900231666667

00:03:29.520 --> 00:03:31.518 So when you open up in Morris and you

NOTE Confidence: 0.818900231666667

00:03:31.518 --> 00:03:33.279 have a view that looks like this.

NOTE Confidence: 0.818900231666667

00:03:33.280 --> 00:03:35.254 This Arena view is just a

NOTE Confidence: 0.818900231666667

00:03:35.254 --> 00:03:37.290 visualization tool to find out and

NOTE Confidence: 0.818900231666667

00:03:37.290 --> 00:03:39.558 list folders that you want to analyse.

NOTE Confidence: 0.818900231666667

00:03:39.560 --> 00:03:41.513 Now I already have a bunch of

NOTE Confidence: 0.818900231666667

00:03:41.513 --> 00:03:43.092 folders listed here on the left

NOTE Confidence: 0.818900231666667

00:03:43.092 --> 00:03:45.126 here and then inside this folder for

NOTE Confidence: 0.818900231666667

00:03:45.126 --> 00:03:46.662 example data sharing for courses

NOTE Confidence: 0.818900231666667

00:03:46.662 --> 00:03:48.276 has a bunch of image files.

NOTE Confidence: 0.818900231666667

00:03:48.280 --> 00:03:49.965 These image files are just

NOTE Confidence: 0.818900231666667

00:03:49.965 --> 00:03:51.313 files that I've processed.

NOTE Confidence: 0.818900231666667

00:03:51.320 --> 00:03:52.656 I'm going to show you what it looks

NOTE Confidence: 0.818900231666667

00:03:52.656 --> 00:03:54.116 like in an explorer here real quick.

NOTE Confidence: 0.818900231666667

00:03:54.120 --> 00:03:55.275 It's going to look something like this,

NOTE Confidence: 0.818900231666667

00:03:55.280 --> 00:03:56.792 where you're going to have a bunch

NOTE Confidence: 0.818900231666667

00:03:56.792 --> 00:03:58.280 of files in here that are just

NOTE Confidence: 0.818900231666667

00:03:58.280 --> 00:03:59.680 going to show you the image files.

NOTE Confidence: 0.818900231666667

00:03:59.680 --> 00:04:00.718 You're not going to see all

NOTE Confidence: 0.818900231666667

00:04:00.718 --> 00:04:01.237 the different files.

NOTE Confidence: 0.818900231666667

00:04:01.240 --> 00:04:02.720 So if you had text files in here,

NOTE Confidence: 0.818900231666667

00:04:02.720 --> 00:04:03.587 PDFs in here,

NOTE Confidence: 0.818900231666667

00:04:03.587 --> 00:04:05.321 you're not going to see that

NOTE Confidence: 0.818900231666667

00:04:05.321 --> 00:04:06.639 in the Arena view.

NOTE Confidence: 0.818900231666667

00:04:06.640 --> 00:04:09.000 You're only going to see the image files.

NOTE Confidence: 0.818900231666667

00:04:09.000 --> 00:04:11.224 Now most people are going to share a

NOTE Confidence: 0.818900231666667

00:04:11.224 --> 00:04:13.848 file or folder that has data that has

NOTE Confidence: 0.818900231666667

00:04:13.848 --> 00:04:16.520 not been converted into the Mars format yet,

NOTE Confidence: 0.818900231666667

00:04:16.520 --> 00:04:17.960 and so one way to convert that file.

NOTE Confidence: 0.818900231666667

00:04:17.960 --> 00:04:19.556 There's two ways to convert those files.

NOTE Confidence: 0.818900231666667

00:04:19.560 --> 00:04:21.024 One way way to convert those

NOTE Confidence: 0.818900231666667

00:04:21.024 --> 00:04:22.800 files is to share a file folder.

NOTE Confidence: 0.818900231666667

00:04:22.800 --> 00:04:24.304 Share your folder and you're going to get

NOTE Confidence: 0.818900231666667

00:04:24.304 --> 00:04:26.359 a a look of some data that looks like this.

NOTE Confidence: 0.818900231666667

00:04:26.360 --> 00:04:28.516 If you have a a native Mrs.

NOTE Confidence: 0.818900231666667

00:04:28.520 --> 00:04:28.760 file,

NOTE Confidence: 0.818900231666667

00:04:28.760 --> 00:04:30.200 it's going to look like this.

NOTE Confidence: 0.818900231666667

00:04:30.200 --> 00:04:32.181 You can see that there's no little

NOTE Confidence: 0.818900231666667

00:04:32.181 --> 00:04:33.918 arrow next to the icon here.

NOTE Confidence: 0.818900231666667

00:04:33.920 --> 00:04:36.120 That means that file has not been converted.

NOTE Confidence: 0.818900231666667

00:04:36.120 --> 00:04:38.200 That file has already been converted to Mrs.

NOTE Confidence: 0.818900231666667

00:04:38.200 --> 00:04:38.455 file.

NOTE Confidence: 0.818900231666667

00:04:38.455 --> 00:04:40.240 And so you can take that file,

NOTE Confidence: 0.818900231666667

00:04:40.240 --> 00:04:41.028 double click on it,

NOTE Confidence: 0.818900231666667

00:04:41.028 --> 00:04:42.210 and it'll open up and you'll

NOTE Confidence: 0.818900231666667

00:04:42.253 --> 00:04:43.278 you'll look at that file.

NOTE Confidence: 0.852489073

00:04:45.440 --> 00:04:46.448 The icon here identifies

NOTE Confidence: 0.852489073

00:04:46.448 --> 00:04:47.960 that that's a 3D data set.

NOTE Confidence: 0.852489073

00:04:47.960 --> 00:04:49.118 If it's a 2D data set,

NOTE Confidence: 0.852489073

00:04:49.120 --> 00:04:50.800 it'll look like a little square.

NOTE Confidence: 0.852489073

00:04:50.800 --> 00:04:51.800 If it's a time lapse,

NOTE Confidence: 0.852489073

00:04:51.800 --> 00:04:52.740 it'll have another icon that'll

NOTE Confidence: 0.852489073

00:04:52.740 --> 00:04:54.119 show you that it's a time lapse.

NOTE Confidence: 0.852489073

00:04:54.120 --> 00:04:55.394 It is. So there's a little bit

NOTE Confidence: 0.852489073

00:04:55.394 --> 00:04:56.319 of information on the file,

NOTE Confidence: 0.852489073

00:04:56.320 --> 00:04:58.160 as well as the size of the file,

NOTE Confidence: 0.852489073

00:04:58.160 --> 00:04:59.504 and the pixel size of the file

NOTE Confidence: 0.852489073

00:04:59.504 --> 00:05:00.672 is listed there in this kind

NOTE Confidence: 0.852489073

00:05:00.672 --> 00:05:01.953 of view that we have right now,

NOTE Confidence: 0.852489073

00:05:01.960 --> 00:05:05.080 which is our detailed view of the file.

NOTE Confidence: 0.852489073

00:05:05.080 --> 00:05:06.130 Now, if it does have a little

NOTE Confidence: 0.852489073

00:05:06.130 --> 00:05:06.720 arrow next to it,

NOTE Confidence: 0.852489073

00:05:06.720 --> 00:05:08.456 that means you need to convert this file

NOTE Confidence: 0.852489073

00:05:08.456 --> 00:05:10.037 before you can go into the next step,

NOTE Confidence: 0.852489073

00:05:10.040 --> 00:05:11.600 which is to open up the

NOTE Confidence: 0.852489073

00:05:11.600 --> 00:05:12.640 file inside of Remars.

NOTE Confidence: 0.852489073

00:05:12.640 --> 00:05:13.444 Now, like I said,

NOTE Confidence: 0.852489073

00:05:13.444 --> 00:05:14.996 a lot of the file formats are

NOTE Confidence: 0.852489073

00:05:14.996 --> 00:05:16.160 directly supported by Mars.

NOTE Confidence: 0.852489073

00:05:16.160 --> 00:05:17.196 Not all of them,

NOTE Confidence: 0.852489073

00:05:17.196 --> 00:05:19.040 but most of the major formats are.

NOTE Confidence: 0.852489073

00:05:19.040 --> 00:05:20.120 So I'm listening a bunch of

NOTE Confidence: 0.852489073

00:05:20.120 --> 00:05:20.840 the major ones here.

NOTE Confidence: 0.852489073

00:05:20.840 --> 00:05:22.440 There's a Nikon file,

NOTE Confidence: 0.852489073

00:05:22.440 --> 00:05:24.040 there's a CZI file,

NOTE Confidence: 0.852489073

00:05:24.040 --> 00:05:26.200 and I think I have a lift file,

NOTE Confidence: 0.852489073

00:05:26.200 --> 00:05:27.474 and I don't have a LIF file,

NOTE Confidence: 0.852489073

00:05:27.480 --> 00:05:28.938 but the LIF files look the

NOTE Confidence: 0.852489073

00:05:28.938 --> 00:05:30.320 same as the CZI files.

NOTE Confidence: 0.852489073

00:05:30.320 --> 00:05:33.058 There's an OIB file that's Metamorphile.

NOTE Confidence: 0.852489073

00:05:33.058 --> 00:05:35.144 There's a lot of different types of

NOTE Confidence: 0.852489073

00:05:35.144 --> 00:05:36.760 file formats that we support Now.

NOTE Confidence: 0.852489073

00:05:36.760 --> 00:05:38.266 The easy solution to convert these

NOTE Confidence: 0.852489073

00:05:38.266 --> 00:05:39.959 files is just to come in here.

NOTE Confidence: 0.852489073

00:05:39.960 --> 00:05:41.542 Right click on the file and it

NOTE Confidence: 0.852489073

00:05:41.542 --> 00:05:42.959 says convert to native format.

NOTE Confidence: 0.852489073

00:05:42.960 --> 00:05:44.878 Now again if it's supported by our

NOTE Confidence: 0.852489073

00:05:44.878 --> 00:05:46.640 file format and you hit convert,

NOTE Confidence: 0.852489073

00:05:46.640 --> 00:05:47.972 you're going to see a little

NOTE Confidence: 0.852489073

00:05:47.972 --> 00:05:48.638 conversion down here.

NOTE Confidence: 0.852489073

00:05:48.640 --> 00:05:49.840 Process depending on the size of

NOTE Confidence: 0.852489073

00:05:49.840 --> 00:05:51.200 the file might be really quick.

NOTE Confidence: 0.852489073

00:05:51.200 --> 00:05:52.424 If it's a really large file

NOTE Confidence: 0.852489073

00:05:52.424 --> 00:05:53.759 it makes it take some time.

NOTE Confidence: 0.852489073

00:05:53.760 --> 00:05:55.069 But now that that file has been

NOTE Confidence: 0.852489073

00:05:55.069 --> 00:05:56.479 converted you see the error disappears.

NOTE Confidence: 0.852489073

00:05:56.480 --> 00:05:58.416 Now you can click on that file and

NOTE Confidence: 0.852489073

00:05:58.416 --> 00:06:00.518 it'll open up that inside of the Morris.

NOTE Confidence: 0.852489073

00:06:00.520 --> 00:06:01.892 Now the other thing I wanted to

NOTE Confidence: 0.852489073

00:06:01.892 --> 00:06:02.897 mention here because it's really

NOTE Confidence: 0.852489073

00:06:02.897 --> 00:06:04.025 important I just spend a little

NOTE Confidence: 0.852489073

00:06:04.025 --> 00:06:05.712 bit of time on this is that some

NOTE Confidence: 0.852489073

00:06:05.712 --> 00:06:06.920 files have multiple components where

NOTE Confidence: 0.852489073

00:06:06.920 --> 00:06:09.440 you save aczi file like a files.

NOTE Confidence: 0.852489073

00:06:09.440 --> 00:06:11.239 Nikon files I think do this as

NOTE Confidence: 0.852489073

00:06:11.239 --> 00:06:13.118 well if you have that option.

NOTE Confidence: 0.852489073

00:06:13.120 --> 00:06:15.245 There's multiple images inside of

NOTE Confidence: 0.852489073

00:06:15.245 --> 00:06:18.088 that file format and so the idea

NOTE Confidence: 0.852489073

00:06:18.088 --> 00:06:21.202 here is if you click on if you share,

NOTE Confidence: 0.852489073

00:06:21.202 --> 00:06:22.980 open up that file like this CZI

NOTE Confidence: 0.852489073

00:06:23.041 --> 00:06:24.677 file has multiple components,

NOTE Confidence: 0.852489073

00:06:24.680 --> 00:06:25.960 so there's actually 3 images

NOTE Confidence: 0.852489073

00:06:25.960 --> 00:06:27.240 in that one CZI file.

NOTE Confidence: 0.852489073

00:06:27.240 --> 00:06:28.878 So if we come over here and look at

NOTE Confidence: 0.852489073

00:06:28.878 --> 00:06:32.528 that CZI file, that CZI file is.

NOTE Confidence: 0.852489073

00:06:32.528 --> 00:06:33.520 Where is he

NOTE Confidence: 0.70461653

00:06:35.920 --> 00:06:36.640 wrong? Folder

NOTE Confidence: 0.58273555

00:06:39.520 --> 00:06:42.160 is this guy. Multi image, right?

NOTE Confidence: 0.58273555

00:06:42.160 --> 00:06:43.960 And so there's three images

NOTE Confidence: 0.58273555

00:06:43.960 --> 00:06:45.628 in that CDI file, right?

NOTE Confidence: 0.58273555

00:06:45.628 --> 00:06:46.540 And you're seeing three

NOTE Confidence: 0.58273555

00:06:46.540 --> 00:06:47.680 different images in the file.

NOTE Confidence: 0.58273555

00:06:47.680 --> 00:06:48.810 Now you don't have to

NOTE Confidence: 0.58273555

00:06:48.810 --> 00:06:49.714 convert every single image.

NOTE Confidence: 0.58273555

00:06:49.720 --> 00:06:51.160 So the nice thing about this,

NOTE Confidence: 0.58273555

00:06:51.160 --> 00:06:52.582 importing the data into an arena

NOTE Confidence: 0.58273555

00:06:52.582 --> 00:06:54.280 that has a data set like this.

NOTE Confidence: 0.58273555

00:06:54.280 --> 00:06:56.170 I can right click just on image

NOTE Confidence: 0.58273555

00:06:56.170 --> 00:06:58.118 #2 and just convert image #2.

NOTE Confidence: 0.58273555

00:06:58.120 --> 00:06:59.872 I don't have to convert image #3 and

NOTE Confidence: 0.58273555

00:06:59.872 --> 00:07:01.915 image #1 because maybe I don't want them.

NOTE Confidence: 0.58273555

00:07:01.920 --> 00:07:03.200 Maybe there were bad images,

NOTE Confidence: 0.58273555

00:07:03.200 --> 00:07:04.677 maybe there was something wrong with them.

NOTE Confidence: 0.58273555

00:07:04.680 --> 00:07:05.990 Maybe you don't really want

NOTE Confidence: 0.58273555

00:07:05.990 --> 00:07:07.038 to convert those files.

NOTE Confidence: 0.58273555

00:07:07.040 --> 00:07:08.396 You can just convert this file.

NOTE Confidence: 0.58273555

00:07:08.400 --> 00:07:10.200 If you want to convert multiple files here,

NOTE Confidence: 0.58273555

00:07:10.200 --> 00:07:11.915 you can select all three of them,

NOTE Confidence: 0.58273555

00:07:11.920 --> 00:07:13.864 hit right click and convert those

NOTE Confidence: 0.58273555

00:07:13.864 --> 00:07:15.640 files into the native format.

NOTE Confidence: 0.58273555

00:07:15.640 --> 00:07:17.278 So that's the main idea and

NOTE Confidence: 0.58273555

00:07:17.278 --> 00:07:19.409 the idea of doing it this way

NOTE Confidence: 0.58273555

00:07:19.409 --> 00:07:21.039 with the raw microscope format.

NOTE Confidence: 0.58273555

00:07:21.040 --> 00:07:22.990 It's the ideal way of doing it is that not

NOTE Confidence: 0.58273555

00:07:23.043 --> 00:07:24.995 only are you converting it inside the Mrs.

NOTE Confidence: 0.58273555

00:07:25.000 --> 00:07:25.776 software itself,

NOTE Confidence: 0.58273555

00:07:25.776 --> 00:07:28.880 but it's also converting for the most part,

NOTE Confidence: 0.58273555

00:07:28.880 --> 00:07:30.528 usually converts the metadata.

NOTE Confidence: 0.58273555

00:07:30.528 --> 00:07:33.000 The metadata contains the channel colors,

NOTE Confidence: 0.58273555

00:07:33.000 --> 00:07:35.440 it contains the voxel sizes.

NOTE Confidence: 0.58273555

00:07:35.440 --> 00:07:37.505 And it makes sure that when you

NOTE Confidence: 0.58273555

00:07:37.505 --> 00:07:39.360 open this file inside of Mrs.

NOTE Confidence: 0.58273555

00:07:39.360 --> 00:07:41.133 and you come in here and you want to

NOTE Confidence: 0.58273555

00:07:41.133 --> 00:07:42.917 make a measurement from here to here.

NOTE Confidence: 0.58273555

00:07:42.920 --> 00:07:44.590 Say I come in here and I want to make

NOTE Confidence: 0.58273555

00:07:44.635 --> 00:07:46.075 a measurement from here to here,

NOTE Confidence: 0.58273555

00:07:46.080 --> 00:07:47.120 there's a measurement tool over.

NOTE Confidence: 0.58273555

00:07:47.120 --> 00:07:48.478 It's just a quick little measurement tool.

NOTE Confidence: 0.58273555

00:07:48.480 --> 00:07:49.880 That measurement tool is going to make sense.

NOTE Confidence: 0.58273555

00:07:49.880 --> 00:07:51.710 So if I come up here and I try to

NOTE Confidence: 0.58273555

00:07:51.769 --> 00:07:53.768 measure one of these little nuclei here,

NOTE Confidence: 0.58273555

00:07:53.768 --> 00:07:55.248 it's telling me that that's

NOTE Confidence: 0.58273555

00:07:55.248 --> 00:07:56.240 five microns across.

NOTE Confidence: 0.58273555

00:07:56.240 --> 00:07:58.081 So that means the voxel sizes are

NOTE Confidence: 0.58273555

00:07:58.081 --> 00:07:59.807 are properly imported in in the

NOTE Confidence: 0.58273555

00:07:59.807 --> 00:08:01.287 measurements and all the measurements

NOTE Confidence: 0.58273555

00:08:01.287 --> 00:08:03.077 and statistics that you end up getting,

NOTE Confidence: 0.58273555

00:08:03.080 --> 00:08:04.616 whether it's volume,

NOTE Confidence: 0.58273555

00:08:04.616 --> 00:08:05.640 surface area,

NOTE Confidence: 0.58273555

00:08:05.640 --> 00:08:07.596 any other parameters that involve the

NOTE Confidence: 0.58273555

00:08:07.596 --> 00:08:10.503 the length or the shape or the size are

NOTE Confidence: 0.58273555

00:08:10.503 --> 00:08:12.464 going to be properly converted into

NOTE Confidence: 0.58273555

00:08:12.464 --> 00:08:14.600 the right format for Mars processing.

NOTE Confidence: 0.58273555

00:08:14.600 --> 00:08:14.988 So anyway,

NOTE Confidence: 0.58273555

00:08:14.988 --> 00:08:15.958 I'm going to stop there.

NOTE Confidence: 0.58273555

00:08:15.960 --> 00:08:17.262 That's just kind of the general

NOTE Confidence: 0.58273555

00:08:17.262 --> 00:08:19.011 idea of kind of making sure that

NOTE Confidence: 0.58273555

00:08:19.011 --> 00:08:20.396 your files are converted right.

NOTE Confidence: 0.58273555

00:08:20.400 --> 00:08:22.875 Now there is a second way of converting data.

NOTE Confidence: 0.58273555

00:08:22.880 --> 00:08:25.477 There is a stand alone file converter

NOTE Confidence: 0.58273555

00:08:25.480 --> 00:08:26.716 and I'll launch it over here.

NOTE Confidence: 0.58273555

00:08:26.720 --> 00:08:28.078 It's going to look something like this.

NOTE Confidence: 0.58273555

00:08:28.080 --> 00:08:28.238 Now,

NOTE Confidence: 0.58273555

00:08:28.238 --> 00:08:29.344 I'm not going to go into a

NOTE Confidence: 0.58273555

00:08:29.344 --> 00:08:30.320 whole lot of details here.

NOTE Confidence: 0.58273555

00:08:30.320 --> 00:08:31.766 If you have some problems importing

NOTE Confidence: 0.58273555

00:08:31.766 --> 00:08:33.203 your files or you're not sure

NOTE Confidence: 0.58273555

00:08:33.203 --> 00:08:34.278 if it's not working right,

NOTE Confidence: 0.58273555

00:08:34.280 --> 00:08:35.988 or if you've converted it and it

NOTE Confidence: 0.58273555

00:08:35.988 --> 00:08:37.638 doesn't convert right, let us know.

NOTE Confidence: 0.58273555

00:08:37.638 --> 00:08:38.556 Sometimes there's bugs,

NOTE Confidence: 0.58273555

00:08:38.560 --> 00:08:39.600 sometimes there's file formats

NOTE Confidence: 0.58273555

00:08:39.600 --> 00:08:40.640 that we don't support.

NOTE Confidence: 0.58273555

00:08:40.640 --> 00:08:41.792 Sometimes there's issues with

NOTE Confidence: 0.58273555

00:08:41.792 --> 00:08:43.232 different types of file formats

NOTE Confidence: 0.58273555

00:08:43.232 --> 00:08:44.918 or the way you acquire your data.

NOTE Confidence: 0.58273555

00:08:44.920 --> 00:08:46.078 Just let us let us know.

NOTE Confidence: 0.58273555

00:08:46.080 --> 00:08:47.280 Contact the support team,

NOTE Confidence: 0.58273555

00:08:47.280 --> 00:08:49.080 we can help you do that.

NOTE Confidence: 0.58273555

00:08:49.080 --> 00:08:50.564 But the file converter is nice because

NOTE Confidence: 0.58273555

00:08:50.564 --> 00:08:52.480 you can put this file converter anywhere.

NOTE Confidence: 0.58273555

00:08:52.480 --> 00:08:53.920 It doesn't have to be on the Mrs.

NOTE Confidence: 0.80408076125

00:08:53.920 --> 00:08:55.400 workstation. You can put it on your laptop,

NOTE Confidence: 0.80408076125

00:08:55.400 --> 00:08:56.720 You can put it on your office machine,

NOTE Confidence: 0.80408076125

00:08:56.720 --> 00:08:58.214 you can put it on your

NOTE Confidence: 0.80408076125

00:08:58.214 --> 00:08:59.520 acquisition machine if you wish.

NOTE Confidence: 0.80408076125

00:08:59.520 --> 00:09:00.600 You put it anywhere you want.

NOTE Confidence: 0.80408076125

00:09:00.600 --> 00:09:01.880 So as soon as you require your data,

NOTE Confidence: 0.80408076125

00:09:01.880 --> 00:09:03.755 you can actually start the

NOTE Confidence: 0.80408076125

00:09:03.755 --> 00:09:05.082 conversion process Here, however,

NOTE Confidence: 0.80408076125

00:09:05.082 --> 00:09:06.294 you're just going to drag your

NOTE Confidence: 0.80408076125

00:09:06.294 --> 00:09:07.836 files in or add your files and

NOTE Confidence: 0.80408076125

00:09:07.836 --> 00:09:08.956 you'll have the parameters here.

NOTE Confidence: 0.80408076125

00:09:08.960 --> 00:09:10.703 And then you'll be there's a start

NOTE Confidence: 0.80408076125

00:09:10.703 --> 00:09:12.717 button and you can convert those files.

NOTE Confidence: 0.80408076125

00:09:12.720 --> 00:09:13.910 Now this is a little bit different

NOTE Confidence: 0.80408076125

00:09:13.910 --> 00:09:15.278 than the Arena view in the sense that

NOTE Confidence: 0.80408076125

00:09:15.278 --> 00:09:16.520 this is going to convert everything.

NOTE Confidence: 0.80408076125

00:09:16.520 --> 00:09:18.081 You don't have an option of just

NOTE Confidence: 0.80408076125

00:09:18.081 --> 00:09:19.484 converting one out of those three

NOTE Confidence: 0.80408076125

00:09:19.484 --> 00:09:21.080 size files that I showed you earlier.

NOTE Confidence: 0.80408076125

00:09:21.080 --> 00:09:23.480 It's going to either do all or not.

NOTE Confidence: 0.80408076125

00:09:23.480 --> 00:09:25.232 But to make sure that this

NOTE Confidence: 0.80408076125

00:09:25.232 --> 00:09:26.400 works at all times,

NOTE Confidence: 0.80408076125

00:09:26.400 --> 00:09:27.800 you have to set a voxel size.

NOTE Confidence: 0.80408076125

00:09:27.800 --> 00:09:30.192 So if for whatever reason the files that

NOTE Confidence: 0.80408076125

00:09:30.192 --> 00:09:32.236 you require don't have a voxel size,

NOTE Confidence: 0.80408076125

00:09:32.240 --> 00:09:34.360 it will ask you for that voxel size.

NOTE Confidence: 0.80408076125

00:09:34.360 --> 00:09:35.680 Now if you don't know the boxel size

NOTE Confidence: 0.80408076125

00:09:35.680 --> 00:09:37.120 at the time, you can still convert it.

NOTE Confidence: 0.80408076125

00:09:37.120 --> 00:09:38.814 You can put a dummy value in

NOTE Confidence: 0.80408076125

00:09:38.814 --> 00:09:40.080 there and change it later,

NOTE Confidence: 0.80408076125

00:09:40.080 --> 00:09:41.680 but the idea is that you have to.

NOTE Confidence: 0.80408076125

00:09:41.680 --> 00:09:43.516 The idea is that you know the voxel size,

NOTE Confidence: 0.80408076125

00:09:43.520 --> 00:09:45.758 the voxel parameters XY and Z,

NOTE Confidence: 0.80408076125

00:09:45.760 --> 00:09:47.461 so they input them in there and

NOTE Confidence: 0.80408076125

00:09:47.461 --> 00:09:49.163 then when you convert the file

NOTE Confidence: 0.80408076125

00:09:49.163 --> 00:09:50.999 it's ready to be used immediately.

NOTE Confidence: 0.80408076125

00:09:51.000 --> 00:09:52.120 And As for TIF files,

NOTE Confidence: 0.80408076125

00:09:52.120 --> 00:09:53.212 I'm not going to get into the

NOTE Confidence: 0.80408076125

00:09:53.212 --> 00:09:54.080 TIF files very much here,

NOTE Confidence: 0.80408076125

00:09:54.080 --> 00:09:55.795 but at the TIF files we have

NOTE Confidence: 0.80408076125

00:09:55.795 --> 00:09:57.000 a TIF reading series.

NOTE Confidence: 0.80408076125

00:09:57.000 --> 00:09:58.918 So whenever you have a TIF stack,

NOTE Confidence: 0.80408076125

00:09:58.920 --> 00:10:00.756 they're named in a particular convention.

NOTE Confidence: 0.80408076125

00:10:00.760 --> 00:10:02.794 There is an option here under

NOTE Confidence: 0.80408076125

00:10:02.794 --> 00:10:04.574 settings to really modify those

NOTE Confidence: 0.80408076125

00:10:04.574 --> 00:10:06.279 TIF parameters to make sure you

NOTE Confidence: 0.80408076125

00:10:06.279 --> 00:10:07.344 have the proper reading frame

NOTE Confidence: 0.80408076125

00:10:07.344 --> 00:10:08.760 that how many channels you have,

NOTE Confidence: 0.80408076125

00:10:08.760 --> 00:10:12.120 how many, how many sections you have,

NOTE Confidence: 0.80408076125

00:10:12.120 --> 00:10:13.028 and things like that.

NOTE Confidence: 0.80408076125

00:10:13.028 --> 00:10:14.630 You can kind of manipulate it a

NOTE Confidence: 0.80408076125

00:10:14.630 --> 00:10:15.967 little bit to make sure that it's

NOTE Confidence: 0.80408076125

00:10:15.967 --> 00:10:17.556 kind of compiled in the right way.

NOTE Confidence: 0.80408076125

00:10:17.560 --> 00:10:19.114 Now, if you name your files properly,

NOTE Confidence: 0.80408076125

00:10:19.120 --> 00:10:21.316 this works like a dream and it's really nice.

NOTE Confidence: 0.80408076125

00:10:21.320 --> 00:10:22.650 So if you have any questions on

NOTE Confidence: 0.80408076125

00:10:22.650 --> 00:10:24.049 saving files that's TIFF and make sure

NOTE Confidence: 0.80408076125

00:10:24.049 --> 00:10:25.231 you input them into Mars properly,

NOTE Confidence: 0.80408076125

00:10:25.240 --> 00:10:26.050 let us know.

NOTE Confidence: 0.80408076125

00:10:26.050 --> 00:10:27.670 I have a separate video tutorial

NOTE Confidence: 0.80408076125

00:10:27.670 --> 00:10:29.627 that I can I can share with you

NOTE Confidence: 0.80408076125

00:10:29.627 --> 00:10:31.562 later that talks about how to import

NOTE Confidence: 0.80408076125

00:10:31.562 --> 00:10:33.032 TIFF files into the software.

NOTE Confidence: 0.80408076125

00:10:33.040 --> 00:10:35.435 OK, so let's close that up. OK.

NOTE Confidence: 0.80408076125

00:10:35.435 --> 00:10:37.080 So let's jump right into Amaris here.

NOTE Confidence: 0.80408076125

00:10:37.080 --> 00:10:38.361 So this is not the file I'm

NOTE Confidence: 0.80408076125

00:10:38.361 --> 00:10:39.240 going to use today.

NOTE Confidence: 0.80408076125

00:10:39.240 --> 00:10:40.591 So today I'm going to focus on

NOTE Confidence: 0.80408076125

00:10:40.591 --> 00:10:41.690 maybe two or three different

NOTE Confidence: 0.80408076125

00:10:41.690 --> 00:10:43.349 files that I'm going to show you

NOTE Confidence: 0.80408076125

00:10:43.349 --> 00:10:45.180 that can kind of cover a lot of

NOTE Confidence: 0.80408076125

00:10:45.180 --> 00:10:47.600 the different features in Amaris.

NOTE Confidence: 0.80408076125

00:10:47.600 --> 00:10:49.360 This file here is one of my favorites.

NOTE Confidence: 0.80408076125

00:10:49.360 --> 00:10:52.800 This is a Microglia data set that has

NOTE Confidence: 0.80408076125

00:10:52.800 --> 00:10:55.862 a really nice red stain and it also

NOTE Confidence: 0.80408076125

00:10:55.862 --> 00:10:58.448 has a secondary marker that's called CD 86,

NOTE Confidence: 0.80408076125

00:10:58.448 --> 00:11:00.200 which is an activation protein for

NOTE Confidence: 0.813332530833333

00:11:00.256 --> 00:11:02.260 the Microglia. And so there's a lot

NOTE Confidence: 0.813332530833333

00:11:02.260 --> 00:11:03.520 of cool localization between this

NOTE Confidence: 0.813332530833333

00:11:03.567 --> 00:11:05.199 red channel and this green channel.

NOTE Confidence: 0.813332530833333

00:11:05.200 --> 00:11:07.824 So the red channel looks like this, right?

NOTE Confidence: 0.813332530833333

00:11:07.824 --> 00:11:09.392 You can see a little bit of

NOTE Confidence: 0.813332530833333

00:11:09.392 --> 00:11:10.639 background in the sample here.

NOTE Confidence: 0.813332530833333

00:11:10.640 --> 00:11:11.540 It's not perfectly clean,

NOTE Confidence: 0.813332530833333

00:11:11.540 --> 00:11:12.440 which is really nice.

NOTE Confidence: 0.813332530833333

00:11:12.440 --> 00:11:14.925 Kind of gives us a lot of places

NOTE Confidence: 0.813332530833333

00:11:14.925 --> 00:11:16.919 to work with in terms of making

NOTE Confidence: 0.813332530833333

00:11:16.919 --> 00:11:18.593 sure that we can render objects

NOTE Confidence: 0.813332530833333

00:11:18.593 --> 00:11:20.359 that are not perfectly clean.

NOTE Confidence: 0.813332530833333

00:11:20.360 --> 00:11:22.264 Where there's a little bit of auto

NOTE Confidence: 0.813332530833333

00:11:22.264 --> 00:11:23.669 fluorescence or background or tissue

NOTE Confidence: 0.813332530833333

00:11:23.669 --> 00:11:25.277 auto fluorescence or any kind of

NOTE Confidence: 0.813332530833333

00:11:25.277 --> 00:11:26.537 tissue background or junk or dirt

NOTE Confidence: 0.813332530833333

00:11:26.537 --> 00:11:27.790 in the data set in the channel.

NOTE Confidence: 0.813332530833333

00:11:27.790 --> 00:11:28.940 And then there's this green

NOTE Confidence: 0.813332530833333

00:11:28.940 --> 00:11:30.538 channel that has a bunch of little

NOTE Confidence: 0.813332530833333

00:11:30.538 --> 00:11:31.792 punked up and we're going to,

NOTE Confidence: 0.813332530833333

00:11:31.800 --> 00:11:34.312 we're going to kind of do some rendering

NOTE Confidence: 0.813332530833333

00:11:34.312 --> 00:11:35.960 and quantification of this function

NOTE Confidence: 0.813332530833333

00:11:35.960 --> 00:11:37.560 in that various different ways.

NOTE Confidence: 0.813332530833333

00:11:37.560 --> 00:11:38.785 Now the first thing we're going to

NOTE Confidence: 0.813332530833333

00:11:38.785 --> 00:11:40.258 talk about a little bit about is

NOTE Confidence: 0.813332530833333

00:11:40.258 --> 00:11:41.393 the navigation inside the software.

NOTE Confidence: 0.813332530833333

00:11:41.400 --> 00:11:41.613 Again,

NOTE Confidence: 0.813332530833333

00:11:41.613 --> 00:11:43.840 I'm going to be doing this as we go here.

NOTE Confidence: 0.813332530833333

00:11:43.840 --> 00:11:45.160 And so the idea is that,

NOTE Confidence: 0.813332530833333

00:11:45.160 --> 00:11:46.231 you know a lot of this is

NOTE Confidence: 0.813332530833333

00:11:46.231 --> 00:11:47.319 kind of going to be the same.

NOTE Confidence: 0.813332530833333

00:11:47.320 --> 00:11:48.839 So let's look at this image here.

NOTE Confidence: 0.813332530833333

00:11:48.840 --> 00:11:50.460 So the basic manipulations

NOTE Confidence: 0.813332530833333

00:11:50.460 --> 00:11:51.675 inside the software,

NOTE Confidence: 0.813332530833333

00:11:51.680 --> 00:11:53.520 when you're looking at just the volume view,

NOTE Confidence: 0.813332530833333

00:11:53.520 --> 00:11:54.318 you have this,

NOTE Confidence: 0.813332530833333

00:11:54.318 --> 00:11:55.914 if you left click and rotate,

NOTE Confidence: 0.813332530833333

00:11:55.920 --> 00:11:58.000 you can turn your image around in 3D.

NOTE Confidence: 0.813332530833333

00:11:58.000 --> 00:11:59.775 This reset button straightens it

NOTE Confidence: 0.813332530833333

00:11:59.775 --> 00:12:02.148 back to the primary default position

NOTE Confidence: 0.813332530833333

00:12:02.148 --> 00:12:05.200 in the way that it was acquired.

NOTE Confidence: 0.813332530833333

00:12:05.200 --> 00:12:06.304 If you hit the mouse wheel

NOTE Confidence: 0.813332530833333

00:12:06.304 --> 00:12:07.040 in the middle here,

NOTE Confidence: 0.813332530833333

00:12:07.040 --> 00:12:09.119 you can zoom in anywhere where your mouse is.

NOTE Confidence: 0.813332530833333

00:12:09.120 --> 00:12:10.448 If I'm in the center there, it'll zoom there.

NOTE Confidence: 0.813332530833333

00:12:10.448 --> 00:12:11.680 If I have my mouse over here,

NOTE Confidence: 0.813332530833333

00:12:11.680 --> 00:12:14.322 it'll zoom into my mouse over here as well.

NOTE Confidence: 0.813332530833333

00:12:14.322 --> 00:12:16.090 And then you can right click and you

NOTE Confidence: 0.813332530833333

00:12:16.143 --> 00:12:17.900 can pan your image around to kind

NOTE Confidence: 0.813332530833333

00:12:17.900 --> 00:12:19.440 of identify where that sample is.

NOTE Confidence: 0.813332530833333

00:12:19.440 --> 00:12:21.400 This is our 3D view.

NOTE Confidence: 0.813332530833333

00:12:21.400 --> 00:12:22.912 This is the kind of the primary

NOTE Confidence: 0.813332530833333

00:12:22.912 --> 00:12:24.460 view where you're going to do the

NOTE Confidence: 0.813332530833333

00:12:24.460 --> 00:12:26.000 majority of your work instead of Mars.

NOTE Confidence: 0.813332530833333

00:12:26.000 --> 00:12:27.170 Sometimes people like to look at

NOTE Confidence: 0.813332530833333

00:12:27.170 --> 00:12:28.799 it in a slice view just to kind

NOTE Confidence: 0.813332530833333

00:12:28.799 --> 00:12:29.999 of navigate and look at their

NOTE Confidence: 0.813332530833333

00:12:30.041 --> 00:12:31.355 data a little bit more closely.

NOTE Confidence: 0.813332530833333

00:12:31.360 --> 00:12:33.264 I use this very often to try

NOTE Confidence: 0.813332530833333

00:12:33.264 --> 00:12:34.679 to make sure and see,

NOTE Confidence: 0.813332530833333

00:12:34.680 --> 00:12:36.682 make sure we have the proper resolution

NOTE Confidence: 0.813332530833333

00:12:36.682 --> 00:12:38.639 to quantify the objects of interest.

NOTE Confidence: 0.813332530833333

00:12:38.640 --> 00:12:40.098 Sometimes the biggest problem I have

NOTE Confidence: 0.813332530833333

00:12:40.098 --> 00:12:41.757 in the support team is that people

NOTE Confidence: 0.813332530833333

00:12:41.757 --> 00:12:43.035 send me data and they're trying

NOTE Confidence: 0.813332530833333

00:12:43.035 --> 00:12:44.640 to render something that's really,

NOTE Confidence: 0.813332530833333

00:12:44.640 --> 00:12:46.677 really small, but they've taken a really,

NOTE Confidence: 0.813332530833333

00:12:46.680 --> 00:12:47.668 really large step size.

NOTE Confidence: 0.813332530833333

00:12:47.668 --> 00:12:49.150 And that makes it really difficult

NOTE Confidence: 0.813332530833333

00:12:49.192 --> 00:12:50.592 to render something in 3D if you

NOTE Confidence: 0.813332530833333

00:12:50.592 --> 00:12:51.746 don't have the proper resolution

NOTE Confidence: 0.813332530833333

00:12:51.746 --> 00:12:53.276 to kind of render that object.

NOTE Confidence: 0.813332530833333

00:12:53.280 --> 00:12:54.372 And we'll talk a little bit about

NOTE Confidence: 0.813332530833333

00:12:54.372 --> 00:12:55.797 that as we move a little bit forward.

NOTE Confidence: 0.813332530833333

00:12:55.800 --> 00:12:56.985 But that's really an important

NOTE Confidence: 0.813332530833333

00:12:56.985 --> 00:12:58.674 thing to keep in mind before you

NOTE Confidence: 0.813332530833333

00:12:58.674 --> 00:13:00.042 bring your data into a Morris

NOTE Confidence: 0.813332530833333

00:13:00.042 --> 00:13:01.637 know what you're trying to render.

NOTE Confidence: 0.813332530833333

00:13:01.640 --> 00:13:03.170 If you're trying to render something

NOTE Confidence: 0.813332530833333

00:13:03.170 --> 00:13:05.095 that's about 1/2 a Micron in diameter

NOTE Confidence: 0.813332530833333

00:13:05.095 --> 00:13:06.515 like these little fibers here,

NOTE Confidence: 0.753779826666667

00:13:06.520 --> 00:13:08.476 these little processes of this microglia,

NOTE Confidence: 0.753779826666667

00:13:08.480 --> 00:13:09.680 that's about 1/2 a Micron,

NOTE Confidence: 0.753779826666667

00:13:09.680 --> 00:13:12.128 1 Micron in diameter and you're taking A2

NOTE Confidence: 0.753779826666667

00:13:12.128 --> 00:13:14.596 Micron step size or something really large,

NOTE Confidence: 0.753779826666667

00:13:14.600 --> 00:13:16.200 you're not going to get a really good

NOTE Confidence: 0.753779826666667

00:13:16.200 --> 00:13:17.424 3D rendering of that object because

NOTE Confidence: 0.753779826666667

00:13:17.424 --> 00:13:18.880 your step size is it's not really

NOTE Confidence: 0.842605511538461

00:13:21.480 --> 00:13:22.698 conducive to kind of rendering this

NOTE Confidence: 0.842605511538461

00:13:22.698 --> 00:13:24.200 guy in 3D because you're taking it.

NOTE Confidence: 0.842605511538461

00:13:24.200 --> 00:13:25.520 You're taking too big of a step size.

NOTE Confidence: 0.842605511538461

00:13:25.520 --> 00:13:27.319 So always keep that in mind when

NOTE Confidence: 0.842605511538461

00:13:27.319 --> 00:13:29.290 you're before you kind of go into

NOTE Confidence: 0.842605511538461

00:13:29.290 --> 00:13:30.720 the microscope and acquire images,

NOTE Confidence: 0.842605511538461

00:13:30.720 --> 00:13:31.994 Do you have the right step size,

NOTE Confidence: 0.842605511538461

00:13:32.000 --> 00:13:33.320 how good can you go?

NOTE Confidence: 0.842605511538461

00:13:33.320 --> 00:13:35.280 Can you make it the proper step size.

NOTE Confidence: 0.842605511538461

00:13:35.280 --> 00:13:37.848 Most microscope have a button on the system

NOTE Confidence: 0.842605511538461

00:13:37.848 --> 00:13:40.317 where you can say optimize your Z step,

NOTE Confidence: 0.842605511538461

00:13:40.320 --> 00:13:41.850 C step is really important

NOTE Confidence: 0.842605511538461

00:13:41.850 --> 00:13:43.074 especially in 3D rendering.

NOTE Confidence: 0.842605511538461

00:13:43.080 --> 00:13:45.082 And that optimize these steps gives you

NOTE Confidence: 0.842605511538461

00:13:45.082 --> 00:13:46.483 what's called Nyquist level sampling

NOTE Confidence: 0.842605511538461

00:13:46.483 --> 00:13:48.435 and that's going to give you the best

NOTE Confidence: 0.842605511538461

00:13:48.440 --> 00:13:50.252 that your acquisition system can achieve

NOTE Confidence: 0.842605511538461

00:13:50.252 --> 00:13:52.210 with the objective and the optics that

NOTE Confidence: 0.842605511538461

00:13:52.210 --> 00:13:54.240 you have currently set up on that system.

NOTE Confidence: 0.842605511538461

00:13:54.240 --> 00:13:55.608 And so that's something that I

NOTE Confidence: 0.842605511538461

00:13:55.608 --> 00:13:57.118 always try to recommend people to do.

NOTE Confidence: 0.842605511538461

00:13:57.120 --> 00:13:57.960 It's not always feasible.

NOTE Confidence: 0.842605511538461

00:13:57.960 --> 00:13:58.800 Sometimes it's going to

NOTE Confidence: 0.842605511538461

00:13:58.800 --> 00:13:59.800 give you too many steps,

NOTE Confidence: 0.842605511538461

00:13:59.800 --> 00:14:01.354 sometimes it's going to take too long.

NOTE Confidence: 0.842605511538461

00:14:01.360 --> 00:14:01.816 You can,

NOTE Confidence: 0.842605511538461

00:14:01.816 --> 00:14:03.968 you don't have to use that button and set

NOTE Confidence: 0.842605511538461

00:14:03.968 --> 00:14:05.914 that optimal step size every single time.

NOTE Confidence: 0.842605511538461

00:14:05.920 --> 00:14:07.656 But if you're trying to get the

NOTE Confidence: 0.842605511538461

00:14:07.656 --> 00:14:09.091 best possible image with the

NOTE Confidence: 0.842605511538461

00:14:09.091 --> 00:14:10.359 best possible Co localization,

NOTE Confidence: 0.842605511538461

00:14:10.360 --> 00:14:11.920 rendering and that sort of stuff,

NOTE Confidence: 0.842605511538461

00:14:11.920 --> 00:14:13.579 you definitely want to try to kind

NOTE Confidence: 0.842605511538461

00:14:13.579 --> 00:14:15.124 of keep using that that optimal

NOTE Confidence: 0.842605511538461

00:14:15.124 --> 00:14:16.951 step size as best you possibly can.

NOTE Confidence: 0.842605511538461

00:14:16.960 --> 00:14:17.376 And again,

NOTE Confidence: 0.842605511538461

00:14:17.376 --> 00:14:18.832 there's times where you don't have to.

NOTE Confidence: 0.842605511538461

00:14:18.840 --> 00:14:19.412 But again,

NOTE Confidence: 0.842605511538461

00:14:19.412 --> 00:14:20.842 if you're rendering something that's

NOTE Confidence: 0.842605511538461

00:14:20.842 --> 00:14:22.919 small and a lot of times people are,

NOTE Confidence: 0.842605511538461

00:14:22.920 --> 00:14:24.960 you want to try to keep it as

NOTE Confidence: 0.842605511538461

00:14:24.960 --> 00:14:27.200 optimal as you can and to to render

NOTE Confidence: 0.842605511538461

00:14:27.200 --> 00:14:29.080 those objects as best you can.

NOTE Confidence: 0.842605511538461

00:14:29.080 --> 00:14:31.600 So again, that's our slice review.

NOTE Confidence: 0.842605511538461

00:14:31.600 --> 00:14:33.222 You can look at 1 channel, 2 channels.

NOTE Confidence: 0.842605511538461

00:14:33.222 --> 00:14:34.477 This is our display adjustment.

NOTE Confidence: 0.842605511538461

00:14:34.480 --> 00:14:35.518 You can adjust the levels here.

NOTE Confidence: 0.842605511538461

00:14:35.520 --> 00:14:38.319 I did that already. This is just a display.

NOTE Confidence: 0.842605511538461

00:14:38.320 --> 00:14:39.600 You're not removing the channels.

NOTE Confidence: 0.842605511538461

00:14:39.600 --> 00:14:41.196 It's just a display adjustment to kind

NOTE Confidence: 0.842605511538461

00:14:41.196 --> 00:14:42.879 of remove some of those lower pixels.

NOTE Confidence: 0.842605511538461

00:14:42.880 --> 00:14:44.680 So your signal looks a little bit blacker.

NOTE Confidence: 0.842605511538461

00:14:44.680 --> 00:14:45.760 So you can see your structure

NOTE Confidence: 0.842605511538461

00:14:45.760 --> 00:14:46.480 a little bit better.

NOTE Confidence: 0.842605511538461

00:14:46.480 --> 00:14:48.160 And you can do this at any point.

NOTE Confidence: 0.842605511538461

00:14:48.160 --> 00:14:50.392 And you can take a snapshot of these

NOTE Confidence: 0.842605511538461

00:14:50.392 --> 00:14:53.079 images at any point you adjust your display.

NOTE Confidence: 0.842605511538461

00:14:53.080 --> 00:14:54.520 There's a snapshot button up here.

NOTE Confidence: 0.842605511538461

00:14:54.520 --> 00:14:55.480 So if you like this image,

NOTE Confidence: 0.842605511538461

00:14:55.480 --> 00:14:57.073 you want to take a snapshot of this image.

NOTE Confidence: 0.842605511538461

00:14:57.080 --> 00:14:58.800 You can move this scale bar over here,

NOTE Confidence: 0.842605511538461

00:14:58.800 --> 00:15:00.144 put it in your image and you

NOTE Confidence: 0.842605511538461

00:15:00.144 --> 00:15:01.200 can hit take snapshot.

NOTE Confidence: 0.842605511538461

00:15:01.200 --> 00:15:02.700 Now now usually I set this

NOTE Confidence: 0.842605511538461

00:15:02.700 --> 00:15:04.359 snapshot to save to my desktop.

NOTE Confidence: 0.842605511538461

00:15:04.360 --> 00:15:06.673 You can choose wherever you wish to save it.

NOTE Confidence: 0.842605511538461

00:15:06.680 --> 00:15:08.520 Usually I save it as a TIFF image.

NOTE Confidence: 0.842605511538461

00:15:08.520 --> 00:15:09.920 We do have a couple other options here,

NOTE Confidence: 0.842605511538461

00:15:09.920 --> 00:15:12.080 but I never save my tips

NOTE Confidence: 0.842605511538461

00:15:12.080 --> 00:15:13.520 my screenshots as those.

NOTE Confidence: 0.842605511538461

00:15:13.520 --> 00:15:15.032 They're usually a little bit smaller

NOTE Confidence: 0.842605511538461

00:15:15.032 --> 00:15:16.040 and they're somewhere compressed.

NOTE Confidence: 0.842605511538461

00:15:16.040 --> 00:15:17.279 TIFF images are a little bit better.

NOTE Confidence: 0.842605511538461

00:15:17.280 --> 00:15:18.894 It maintains that the true resolution

NOTE Confidence: 0.842605511538461

00:15:18.894 --> 00:15:21.080 of the of the image on the screen.

NOTE Confidence: 0.842605511538461

00:15:21.080 --> 00:15:23.040 And so if you click this and take a snapshot,

NOTE Confidence: 0.842605511538461

00:15:23.040 --> 00:15:24.430 it'll automatically take a snapshot

NOTE Confidence: 0.842605511538461

00:15:24.430 --> 00:15:26.582 and you have a nice high resolution

NOTE Confidence: 0.842605511538461

00:15:26.582 --> 00:15:27.998 snapshot of that structure

NOTE Confidence: 0.923971223333333

00:15:28.000 --> 00:15:29.116 of exactly what we're looking at.

NOTE Confidence: 0.923971223333333

00:15:29.120 --> 00:15:30.720 Again, I have those little lines in there.

NOTE Confidence: 0.923971223333333

00:15:30.720 --> 00:15:32.092 So whatever you see on the screen

NOTE Confidence: 0.923971223333333

00:15:32.092 --> 00:15:33.637 that is going to be in the snapshot.

NOTE Confidence: 0.923971223333333

00:15:33.640 --> 00:15:35.800 So that snapshot just so you know has

NOTE Confidence: 0.923971223333333

00:15:35.800 --> 00:15:37.637 those little 2 little squares in it.

NOTE Confidence: 0.923971223333333

00:15:37.640 --> 00:15:38.792 So if you don't want those

NOTE Confidence: 0.923971223333333

00:15:38.792 --> 00:15:39.560 little squares over here,

NOTE Confidence: 0.923971223333333

00:15:39.560 --> 00:15:40.660 obviously delete those structures

NOTE Confidence: 0.923971223333333

00:15:40.660 --> 00:15:42.760 over here and then take that snapshot.

NOTE Confidence: 0.923971223333333

00:15:42.760 --> 00:15:44.648 So whatever you see on the screen is

NOTE Confidence: 0.923971223333333

00:15:44.648 --> 00:15:46.759 what you get in terms of your snapshot.

NOTE Confidence: 0.923971223333333

00:15:46.760 --> 00:15:47.896 So always remember that.

NOTE Confidence: 0.923971223333333

00:15:47.896 --> 00:15:49.316 Same thing goes when we,

NOTE Confidence: 0.923971223333333

00:15:49.320 --> 00:15:50.376 when we talk a little bit

NOTE Confidence: 0.923971223333333

00:15:50.376 --> 00:15:51.080 about the animation later.

NOTE Confidence: 0.923971223333333

00:15:51.080 --> 00:15:52.118 Whatever you see on the screen,

NOTE Confidence: 0.923971223333333

00:15:52.120 --> 00:15:53.320 when you're setting your animation up,

NOTE Confidence: 0.923971223333333

00:15:53.320 --> 00:15:54.472 that's what's going to be recorded

NOTE Confidence: 0.923971223333333

00:15:54.472 --> 00:15:55.871 and we'll do a quick animation towards

NOTE Confidence: 0.923971223333333

00:15:55.871 --> 00:15:57.600 the end of the end of this session.

NOTE Confidence: 0.923971223333333

00:15:57.600 --> 00:15:59.480 Just to give you an idea of how that works.

NOTE Confidence: 0.923971223333333

00:15:59.480 --> 00:16:01.184 Because that's a really cool little

NOTE Confidence: 0.923971223333333

00:16:01.184 --> 00:16:02.320 feature for lab presentations,

NOTE Confidence: 0.923971223333333

00:16:02.320 --> 00:16:03.588 making quick little movies,

NOTE Confidence: 0.923971223333333

00:16:03.588 --> 00:16:05.833 being able to kind of identify and

NOTE Confidence: 0.923971223333333

00:16:05.833 --> 00:16:07.793 show something to a colleague to say,

NOTE Confidence: 0.923971223333333

00:16:07.800 --> 00:16:10.058 hey, this looks really cool and make

NOTE Confidence: 0.923971223333333

00:16:10.058 --> 00:16:12.050 a nice little 3D movie of that makes

NOTE Confidence: 0.923971223333333

00:16:12.108 --> 00:16:13.879 it really simple and easy to do.

NOTE Confidence: 0.923971223333333

00:16:13.880 --> 00:16:14.525 So another view.

NOTE Confidence: 0.923971223333333

00:16:14.525 --> 00:16:15.600 Here is our section view.

NOTE Confidence: 0.923971223333333

00:16:15.600 --> 00:16:15.985 Again,

NOTE Confidence: 0.923971223333333

00:16:15.985 --> 00:16:18.680 this is mostly just a visualization tool.

NOTE Confidence: 0.923971223333333

00:16:18.680 --> 00:16:21.065 If we look at this guy here you have

NOTE Confidence: 0.923971223333333

00:16:21.065 --> 00:16:23.080 your XY view, You have your two X,

NOTE Confidence: 0.923971223333333

00:16:23.080 --> 00:16:25.080 you have your XZ and your XY views.

NOTE Confidence: 0.923971223333333

00:16:25.080 --> 00:16:27.040 You can move this look I can

NOTE Confidence: 0.923971223333333

00:16:27.040 --> 00:16:29.880 click on where where is that?

NOTE Confidence: 0.635175851428571

00:16:35.800 --> 00:16:37.998 There it is. Oops, there it is.

NOTE Confidence: 0.635175851428571

00:16:38.000 --> 00:16:40.072 It's bigger and you can zoom in here

NOTE Confidence: 0.635175851428571

00:16:40.072 --> 00:16:42.240 and you can adjust the slicer here.

NOTE Confidence: 0.635175851428571

00:16:42.240 --> 00:16:43.486 You can click your thing here and

NOTE Confidence: 0.635175851428571

00:16:43.486 --> 00:16:44.997 you can kind of move exactly in here.

NOTE Confidence: 0.635175851428571

00:16:45.000 --> 00:16:46.330 So if you were kind of interested

NOTE Confidence: 0.635175851428571

00:16:46.330 --> 00:16:47.838 in what was going on right there,

NOTE Confidence: 0.635175851428571

00:16:47.840 --> 00:16:49.100 I can click my cursor right

NOTE Confidence: 0.635175851428571

00:16:49.100 --> 00:16:50.740 there and you can see it's right

NOTE Confidence: 0.635175851428571

00:16:50.740 --> 00:16:52.234 smack dab on the structure there.

NOTE Confidence: 0.635175851428571

00:16:52.240 --> 00:16:53.752 If you want to get rid of those crosshairs,

NOTE Confidence: 0.635175851428571

00:16:53.760 --> 00:16:57.600 you can get rid of those crosshairs as well.

NOTE Confidence: 0.635175851428571

00:16:57.600 --> 00:16:59.560 Come up here and you can turn those

NOTE Confidence: 0.635175851428571

00:16:59.560 --> 00:17:01.239 crosshairs off and you can see exactly

NOTE Confidence: 0.635175851428571

00:17:01.240 --> 00:17:02.878 exactly where you're going in those sections.

NOTE Confidence: 0.635175851428571

00:17:02.880 --> 00:17:04.920 So just another visualization again,

NOTE Confidence: 0.635175851428571

00:17:04.920 --> 00:17:06.480 you can take a snapshot of

NOTE Confidence: 0.635175851428571

00:17:06.480 --> 00:17:08.040 any of these views as well.

NOTE Confidence: 0.635175851428571

00:17:08.040 --> 00:17:09.516 And there's an extended section here.

NOTE Confidence: 0.635175851428571

00:17:09.520 --> 00:17:12.796 So you can that that crosshair here.

NOTE Confidence: 0.635175851428571

00:17:12.800 --> 00:17:15.311 You can make it a little bit wider and

NOTE Confidence: 0.635175851428571

00:17:15.311 --> 00:17:17.705 show more of your data in this way,

NOTE Confidence: 0.635175851428571

00:17:17.705 --> 00:17:19.280 in this way as well.

NOTE Confidence: 0.635175851428571

00:17:19.280 --> 00:17:20.837 And you can show a little bit more of

NOTE Confidence: 0.635175851428571

00:17:20.837 --> 00:17:22.564 the data if you want to take a snapshot

NOTE Confidence: 0.635175851428571

00:17:22.564 --> 00:17:23.969 that's in showing the data inside

NOTE Confidence: 0.635175851428571

00:17:23.969 --> 00:17:25.433 of that little region of interest.

NOTE Confidence: 0.635175851428571

00:17:25.440 --> 00:17:26.637 There's a lot of different options here.

NOTE Confidence: 0.635175851428571

00:17:26.640 --> 00:17:27.336 For visualization,

NOTE Confidence: 0.635175851428571

00:17:27.336 --> 00:17:30.120 let's go back to our 3D view here.

NOTE Confidence: 0.635175851428571

00:17:30.120 --> 00:17:32.760 So let me adjust my levels here a little bit.

NOTE Confidence: 0.852501971666667

00:17:35.600 --> 00:17:38.200 So we're going to focus today on the

NOTE Confidence: 0.852501971666667

00:17:38.200 --> 00:17:39.880 green and the red channel and we're

NOTE Confidence: 0.852501971666667

00:17:39.880 --> 00:17:41.724 going to focus on making surface

NOTE Confidence: 0.852501971666667

00:17:41.724 --> 00:17:43.274 renderings first of the structures.

NOTE Confidence: 0.852501971666667

00:17:43.280 --> 00:17:45.140 Now there's a lot of different

NOTE Confidence: 0.852501971666667

00:17:45.140 --> 00:17:47.040 ways to make surfaces in a Mars.

NOTE Confidence: 0.852501971666667

00:17:47.040 --> 00:17:48.545 I've I've done a bunch of them

NOTE Confidence: 0.852501971666667

00:17:48.545 --> 00:17:50.086 already here and I'm going to talk

NOTE Confidence: 0.852501971666667

00:17:50.086 --> 00:17:51.559 a little bit about all three of

NOTE Confidence: 0.852501971666667

00:17:51.559 --> 00:17:53.638 them and I'm going to just talk very

NOTE Confidence: 0.852501971666667

00:17:53.638 --> 00:17:55.286 briefly about what are why one,

NOTE Confidence: 0.852501971666667

00:17:55.286 --> 00:17:57.407 why we, why would you choose one

NOTE Confidence: 0.852501971666667

00:17:57.407 --> 00:17:59.168 over the other, excuse me,

NOTE Confidence: 0.852501971666667

00:17:59.168 --> 00:18:02.080 why you would choose one over the other.

NOTE Confidence: 0.852501971666667

00:18:02.080 --> 00:18:04.411 And the way we've done surfaces for

NOTE Confidence: 0.852501971666667

00:18:04.411 --> 00:18:07.405 a long time in a Mars for the last 30

NOTE Confidence: 0.852501971666667

00:18:07.405 --> 00:18:09.700 odd years we've done what's called

NOTE Confidence: 0.852501971666667

00:18:09.700 --> 00:18:11.875 an intensity based surface creation.

NOTE Confidence: 0.852501971666667

00:18:11.880 --> 00:18:14.000 Basically what that means is we do a

NOTE Confidence: 0.852501971666667

00:18:14.000 --> 00:18:16.280 little bit of pre processing of our data.

NOTE Confidence: 0.852501971666667

00:18:16.280 --> 00:18:18.635 We identify that the structures

NOTE Confidence: 0.852501971666667

00:18:18.635 --> 00:18:20.519 are a particular size.

NOTE Confidence: 0.852501971666667

00:18:20.520 --> 00:18:21.288 There's some background.

NOTE Confidence: 0.852501971666667

00:18:21.288 --> 00:18:23.080 We do a little bit of smoothing,

NOTE Confidence: 0.852501971666667

00:18:23.080 --> 00:18:24.452 do a Gaussian blur,

NOTE Confidence: 0.852501971666667

00:18:24.452 --> 00:18:26.167 which is very traditional way

NOTE Confidence: 0.852501971666667

00:18:26.167 --> 00:18:27.560 people do segmentation,

NOTE Confidence: 0.852501971666667

00:18:27.560 --> 00:18:28.910 whether it's in Fiji or

NOTE Confidence: 0.852501971666667

00:18:28.910 --> 00:18:29.720 other software applications,

NOTE Confidence: 0.852501971666667

00:18:29.720 --> 00:18:31.922 they're very typical first step to

NOTE Confidence: 0.852501971666667

00:18:31.922 --> 00:18:34.825 kind of clean up your data is to do

NOTE Confidence: 0.852501971666667

00:18:34.825 --> 00:18:36.000 these kind of smoothing activities.

NOTE Confidence: 0.852501971666667

00:18:36.000 --> 00:18:38.800 Now recently, over the last 5-6 years,

NOTE Confidence: 0.852501971666667

00:18:38.800 --> 00:18:39.916 microscope companies have done

NOTE Confidence: 0.852501971666667

00:18:39.916 --> 00:18:41.590 their own smoothing and they do

NOTE Confidence: 0.852501971666667

00:18:41.635 --> 00:18:43.119 their own background subtraction.

NOTE Confidence: 0.852501971666667

00:18:43.120 --> 00:18:45.316 They, you know, Leica has Thunder,

NOTE Confidence: 0.852501971666667

00:18:45.320 --> 00:18:49.114 Zeiss has Airy scan, Nikon has denoising.

NOTE Confidence: 0.852501971666667

00:18:49.120 --> 00:18:51.352 There's all these really fancy tools

NOTE Confidence: 0.852501971666667

00:18:51.352 --> 00:18:53.760 that are doing these preprocessing

NOTE Confidence: 0.852501971666667

00:18:53.760 --> 00:18:55.360 already in the acquisition system.

NOTE Confidence: 0.852501971666667

00:18:55.360 --> 00:18:56.332 It's all post processing,

NOTE Confidence: 0.852501971666667

00:18:56.332 --> 00:18:57.790 but it's all after they acquire

NOTE Confidence: 0.852501971666667

00:18:57.835 --> 00:18:59.207 the data and it's all based on

NOTE Confidence: 0.852501971666667

00:18:59.207 --> 00:19:00.480 their optics of the microscope.

NOTE Confidence: 0.852501971666667

00:19:00.480 --> 00:19:02.130 And they're trying to optimize the

NOTE Confidence: 0.852501971666667

00:19:02.130 --> 00:19:03.600 visualization to show the signal,

NOTE Confidence: 0.852501971666667

00:19:03.600 --> 00:19:04.965 what is signal and what is noise

NOTE Confidence: 0.852501971666667

00:19:04.965 --> 00:19:06.438 and kind of get rid of as much

NOTE Confidence: 0.852501971666667

00:19:06.438 --> 00:19:07.975 of that noise as we can using a

NOTE Confidence: 0.852501971666667

00:19:07.975 --> 00:19:08.835 lot of those features.

NOTE Confidence: 0.852501971666667

00:19:08.840 --> 00:19:11.760 They actually do a lot of smoothing already.

NOTE Confidence: 0.852501971666667

00:19:11.760 --> 00:19:13.400 And so sometimes you don't have to do

NOTE Confidence: 0.852501971666667

00:19:13.400 --> 00:19:14.880 any blurring in the Morris to do that.

NOTE Confidence: 0.852501971666667

00:19:14.880 --> 00:19:16.242 And again it's something that you

NOTE Confidence: 0.852501971666667

00:19:16.242 --> 00:19:18.146 need to be made aware of because a

NOTE Confidence: 0.852501971666667

00:19:18.146 --> 00:19:19.562 lot of times the biggest pitfall

NOTE Confidence: 0.852501971666667

00:19:19.617 --> 00:19:20.925 people run into with the Morris

NOTE Confidence: 0.852501971666667

00:19:20.925 --> 00:19:22.106 is they come in here,

NOTE Confidence: 0.852501971666667

00:19:22.106 --> 00:19:24.554 I'm going to just rebuild this surface here,

NOTE Confidence: 0.852501971666667

00:19:24.560 --> 00:19:24.910 right.

NOTE Confidence: 0.852501971666667

00:19:24.910 --> 00:19:27.010 The the most common problem that

NOTE Confidence: 0.852501971666667

00:19:27.010 --> 00:19:29.349 people run into is that they run

NOTE Confidence: 0.852501971666667

00:19:29.349 --> 00:19:31.505 through a Mars and we're wizard based

NOTE Confidence: 0.852501971666667

00:19:31.505 --> 00:19:33.791 as we're going to see a lot of the

NOTE Confidence: 0.852501971666667

00:19:33.800 --> 00:19:35.304 tools we're going to come in here to

NOTE Confidence: 0.852501971666667

00:19:35.304 --> 00:19:36.712 make these surfaces and make these

NOTE Confidence: 0.852501971666667

00:19:36.712 --> 00:19:37.952 renderings are all wizard based.

NOTE Confidence: 0.852501971666667

00:19:37.960 --> 00:19:40.256 We're going to kind of step through

NOTE Confidence: 0.852501971666667

00:19:40.256 --> 00:19:41.928 the process within the wizard.

NOTE Confidence: 0.852501971666667

00:19:41.928 --> 00:19:42.960 Inside the wizard,

NOTE Confidence: 0.852501971666667

00:19:42.960 --> 00:19:43.956 you're going to make some choices,

NOTE Confidence: 0.852501971666667

00:19:43.960 --> 00:19:44.902 whether it's smoothing,

NOTE Confidence: 0.852501971666667

00:19:44.902 --> 00:19:46.158 whether it's background subtraction,

NOTE Confidence: 0.852501971666667

00:19:46.160 --> 00:19:48.280 whether it's a threshold splitting,

NOTE Confidence: 0.852501971666667

00:19:48.280 --> 00:19:49.480 a couple of different features.

NOTE Confidence: 0.852501971666667

00:19:49.480 --> 00:19:51.160 There's not a lot of options here.

NOTE Confidence: 0.852501971666667

00:19:51.160 --> 00:19:52.624 We try to limit it to make it

NOTE Confidence: 0.852501971666667

00:19:52.624 --> 00:19:53.599 as simple as possible,

NOTE Confidence: 0.852501971666667

00:19:53.600 --> 00:19:55.135 but the biggest pitfall people

NOTE Confidence: 0.852501971666667

00:19:55.135 --> 00:19:57.427 run into is they just use the

NOTE Confidence: 0.852501971666667

00:19:57.427 --> 00:19:59.157 default parameters and that's it.

NOTE Confidence: 0.852501971666667

00:19:59.160 --> 00:20:00.640 They come in through here,

NOTE Confidence: 0.852501971666667

00:20:00.640 --> 00:20:02.800 they'll create this little blue BLOB up here.

NOTE Confidence: 0.780854506

00:20:02.800 --> 00:20:03.800 Right. And you'll see surfaces,

NOTE Confidence: 0.780854506

00:20:03.800 --> 00:20:04.770 one get created and they're

NOTE Confidence: 0.780854506

00:20:04.770 --> 00:20:06.040 going to walk through the wizard.

NOTE Confidence: 0.780854506

00:20:06.040 --> 00:20:07.520 You'll see a couple things that are checked.

NOTE Confidence: 0.780854506

00:20:07.520 --> 00:20:08.770 Sometimes you don't need these

NOTE Confidence: 0.780854506

00:20:08.770 --> 00:20:10.415 features and you turn them off, right.

NOTE Confidence: 0.780854506

00:20:10.415 --> 00:20:11.640 I'll talk a little bit about what

NOTE Confidence: 0.780854506

00:20:11.640 --> 00:20:12.756 these features are a little bit later,

NOTE Confidence: 0.780854506

00:20:12.760 --> 00:20:14.146 but usually I turn them off until

NOTE Confidence: 0.780854506

00:20:14.146 --> 00:20:15.759 I know that I'm going to use them.

NOTE Confidence: 0.780854506

00:20:15.760 --> 00:20:18.640 Always turn them on later within the process.

NOTE Confidence: 0.780854506

00:20:18.640 --> 00:20:21.195 But the idea is that the biggest part

NOTE Confidence: 0.780854506

00:20:21.195 --> 00:20:22.950 of a Mars is you have to be able

NOTE Confidence: 0.780854506

00:20:23.006 --> 00:20:24.800 to render the objects of interest.

NOTE Confidence: 0.780854506

00:20:24.800 --> 00:20:25.800 If you can't do that,

NOTE Confidence: 0.780854506

00:20:25.800 --> 00:20:27.198 whether it's with a spot object,

NOTE Confidence: 0.780854506

00:20:27.200 --> 00:20:29.480 surface object or filament object,

NOTE Confidence: 0.780854506

00:20:29.480 --> 00:20:31.470 you have to kind of find maybe

NOTE Confidence: 0.780854506

00:20:31.470 --> 00:20:32.880 another way to label the structures.

NOTE Confidence: 0.780854506

00:20:32.880 --> 00:20:34.200 Maybe they're not labeled well enough.

NOTE Confidence: 0.780854506

00:20:34.200 --> 00:20:35.670 Maybe you have to improve the antibody

NOTE Confidence: 0.780854506

00:20:35.670 --> 00:20:37.240 stain and get rid of the background.

NOTE Confidence: 0.780854506

00:20:37.240 --> 00:20:38.744 There's a lot of different things you can

NOTE Confidence: 0.780854506

00:20:38.744 --> 00:20:40.679 do to kind of make the software work better.

NOTE Confidence: 0.780854506

00:20:40.680 --> 00:20:42.300 But the idea is that we need to be able

NOTE Confidence: 0.780854506

00:20:42.344 --> 00:20:43.796 to segment the objects of interest.

NOTE Confidence: 0.780854506

00:20:43.800 --> 00:20:45.697 Now when you get into this particular

NOTE Confidence: 0.780854506

00:20:45.697 --> 00:20:47.240 step here, we're at step number two,

NOTE Confidence: 0.780854506

00:20:47.240 --> 00:20:48.360 first step, there's some,

NOTE Confidence: 0.780854506

00:20:48.360 --> 00:20:50.599 there is a region of interest tool here.

NOTE Confidence: 0.780854506

00:20:50.600 --> 00:20:51.699 Not going to get into a whole

NOTE Confidence: 0.780854506

00:20:51.699 --> 00:20:52.400 lot of ideas here,

NOTE Confidence: 0.780854506

00:20:52.400 --> 00:20:53.680 but this region of interest,

NOTE Confidence: 0.780854506

00:20:53.680 --> 00:20:55.000 basically if you did this,

NOTE Confidence: 0.780854506

00:20:55.000 --> 00:20:57.072 you would be able to kind of choose

NOTE Confidence: 0.780854506

00:20:57.072 --> 00:20:58.598 a little box region here.

NOTE Confidence: 0.780854506

00:20:58.600 --> 00:21:00.280 You can adjust the size here and

NOTE Confidence: 0.780854506

00:21:00.280 --> 00:21:01.000 you can analyze.

NOTE Confidence: 0.780854506

00:21:01.000 --> 00:21:04.342 It's just a little box the the limitation

NOTE Confidence: 0.780854506

00:21:04.342 --> 00:21:06.760 here is that it has to be a cube.

NOTE Confidence: 0.780854506

00:21:06.760 --> 00:21:08.328 There are there are options to do

NOTE Confidence: 0.780854506

00:21:08.328 --> 00:21:10.250 kind of non cubed region of interests

NOTE Confidence: 0.780854506

00:21:10.250 --> 00:21:12.044 and again if that's something that

NOTE Confidence: 0.780854506

00:21:12.095 --> 00:21:13.840 your data requires contact support,

NOTE Confidence: 0.780854506

00:21:13.840 --> 00:21:15.648 we can walk you through some some ways

NOTE Confidence: 0.780854506

00:21:15.648 --> 00:21:17.477 to kind of analyze bits and pieces.

NOTE Confidence: 0.780854506

00:21:17.480 --> 00:21:18.628 That's not a square,

NOTE Confidence: 0.780854506

00:21:18.628 --> 00:21:20.735 but for today we're going to process

NOTE Confidence: 0.780854506

00:21:20.735 --> 00:21:22.989 the entire image here because we have

NOTE Confidence: 0.780854506

00:21:22.989 --> 00:21:24.908 all these little microglia that we

NOTE Confidence: 0.780854506

00:21:24.908 --> 00:21:27.280 want to render as a structural object.

NOTE Confidence: 0.780854506

00:21:27.280 --> 00:21:29.350 So a lot of the things that we're going

NOTE Confidence: 0.780854506

00:21:29.350 --> 00:21:31.719 to do here require that smoothing factor,

NOTE Confidence: 0.780854506

00:21:31.720 --> 00:21:33.016 background subtraction or the

NOTE Confidence: 0.780854506

00:21:33.016 --> 00:21:34.960 new feature in a Mars 10,

NOTE Confidence: 0.780854506

00:21:34.960 --> 00:21:36.717 which I'm going to 10.1 rather is

NOTE Confidence: 0.780854506

00:21:36.717 --> 00:21:38.120 this machine learning segmentation,

NOTE Confidence: 0.780854506

00:21:38.120 --> 00:21:39.499 which is I'm going to walk through

NOTE Confidence: 0.780854506

00:21:39.499 --> 00:21:40.838 that with the most detail here.

NOTE Confidence: 0.780854506

00:21:40.840 --> 00:21:42.512 But what I wanted to just kind of

NOTE Confidence: 0.780854506

00:21:42.512 --> 00:21:44.455 set the stage for is that the the

NOTE Confidence: 0.780854506

00:21:44.455 --> 00:21:46.252 most common thing that people end up

NOTE Confidence: 0.780854506

00:21:46.252 --> 00:21:48.037 doing is they keep this the default,

NOTE Confidence: 0.780854506

00:21:48.040 --> 00:21:49.690 which this value here is double

NOTE Confidence: 0.780854506

00:21:49.690 --> 00:21:50.515 the voxel size,

NOTE Confidence: 0.780854506

00:21:50.520 --> 00:21:52.480 that that is just a default value.

NOTE Confidence: 0.780854506

00:21:52.480 --> 00:21:54.209 Don't get stuck by using that value

NOTE Confidence: 0.780854506

00:21:54.209 --> 00:21:56.318 because that is not always the right value.

NOTE Confidence: 0.780854506

00:21:56.320 --> 00:21:58.360 Sometimes it's too much smoothing

NOTE Confidence: 0.780854506

00:21:58.360 --> 00:22:00.520 and it blurs the data and you lose

NOTE Confidence: 0.780854506

00:22:00.520 --> 00:22:01.800 detail on your spine,

NOTE Confidence: 0.780854506

00:22:01.800 --> 00:22:02.643 small little structures.

NOTE Confidence: 0.780854506

00:22:02.643 --> 00:22:04.329 Now if you're doing cell bodies

NOTE Confidence: 0.780854506

00:22:04.329 --> 00:22:05.359 and big structures,

NOTE Confidence: 0.780854506

00:22:05.360 --> 00:22:06.290 the smoothing factor is going

NOTE Confidence: 0.780854506

00:22:06.290 --> 00:22:07.034 to be perfectly fine,

NOTE Confidence: 0.780854506

00:22:07.040 --> 00:22:08.936 but you start looking at small

NOTE Confidence: 0.780854506

00:22:08.936 --> 00:22:10.200 fine structures of dendrites,

NOTE Confidence: 0.780854506

00:22:10.200 --> 00:22:11.820 processes, little fibers,

NOTE Confidence: 0.780854506

00:22:11.820 --> 00:22:13.440 fibers like structures.

NOTE Confidence: 0.949460202

00:22:13.440 --> 00:22:14.800 You're not going to want

NOTE Confidence: 0.949460202

00:22:14.800 --> 00:22:16.160 to have too much smoothing.

NOTE Confidence: 0.949460202

00:22:16.160 --> 00:22:18.056 You should have some smoothing whether

NOTE Confidence: 0.949460202

00:22:18.056 --> 00:22:20.524 you do it on your acquisition side

NOTE Confidence: 0.949460202

00:22:20.524 --> 00:22:22.798 using denoising or what have you.

NOTE Confidence: 0.949460202

00:22:22.800 --> 00:22:23.646 You want to kind of improve

NOTE Confidence: 0.949460202

00:22:23.646 --> 00:22:24.400 that a little bit here.

NOTE Confidence: 0.949460202

00:22:24.400 --> 00:22:25.744 And usually I go to about

NOTE Confidence: 0.949460202

00:22:25.744 --> 00:22:26.640 a single pixel width,

NOTE Confidence: 0.949460202

00:22:26.640 --> 00:22:27.896 especially when I'm doing

NOTE Confidence: 0.949460202

00:22:27.896 --> 00:22:29.152 something that's really fine

NOTE Confidence: 0.949460202

00:22:29.152 --> 00:22:30.559 structure like these dendrites,

NOTE Confidence: 0.949460202

00:22:30.560 --> 00:22:32.440 like there's a lot of fine structures here.

NOTE Confidence: 0.949460202

00:22:32.440 --> 00:22:33.718 These guys are not very big,

NOTE Confidence: 0.949460202

00:22:33.720 --> 00:22:35.274 they're only maybe at some points

NOTE Confidence: 0.949460202

00:22:35.274 --> 00:22:37.398 only like two or three pixels across.

NOTE Confidence: 0.949460202

00:22:37.400 --> 00:22:38.765 So we want to keep that relatively

NOTE Confidence: 0.949460202

00:22:38.765 --> 00:22:40.322 low and this is a common practice

NOTE Confidence: 0.949460202

00:22:40.322 --> 00:22:41.714 no matter which method we're using,

NOTE Confidence: 0.949460202

00:22:41.720 --> 00:22:43.244 whether you're going to use machine

NOTE Confidence: 0.949460202

00:22:43.244 --> 00:22:45.254 learning or you're going to use the kind

NOTE Confidence: 0.949460202

00:22:45.254 --> 00:22:46.676 of the general intensity based creation.

NOTE Confidence: 0.949460202

00:22:46.680 --> 00:22:48.568 Both of them are really important to make

NOTE Confidence: 0.949460202

00:22:48.568 --> 00:22:50.342 sure that we're getting the detail that

NOTE Confidence: 0.949460202

00:22:50.342 --> 00:22:52.199 we want to render within our objects.

NOTE Confidence: 0.949460202

00:22:52.200 --> 00:22:54.076 Because if I that is too high,

NOTE Confidence: 0.949460202

00:22:54.080 --> 00:22:55.844 what's going to happen is we're

NOTE Confidence: 0.949460202

00:22:55.844 --> 00:22:57.637 going to start blurring this data

NOTE Confidence: 0.949460202

00:22:57.637 --> 00:22:59.583 and our surface is going to include

NOTE Confidence: 0.949460202

00:22:59.583 --> 00:23:01.256 spaces in between fibers like this

NOTE Confidence: 0.949460202

00:23:01.256 --> 00:23:02.976 where this data in the middle of

NOTE Confidence: 0.949460202

00:23:02.976 --> 00:23:04.104 this little structure here is going

NOTE Confidence: 0.949460202

00:23:04.104 --> 00:23:05.783 to be created as part of the surface

NOTE Confidence: 0.949460202

00:23:05.783 --> 00:23:06.999 structure where in reality it's not.

NOTE Confidence: 0.949460202

00:23:07.000 --> 00:23:08.442 It's a branch that comes up here

NOTE Confidence: 0.949460202

00:23:08.442 --> 00:23:10.060 and goes this way as we want to make

NOTE Confidence: 0.949460202

00:23:10.060 --> 00:23:11.436 sure that we can render as much as

NOTE Confidence: 0.949460202

00:23:11.436 --> 00:23:12.640 we can and visualize what we can.

NOTE Confidence: 0.949460202

00:23:12.640 --> 00:23:14.439 Again, always goes back to the acquisition.

NOTE Confidence: 0.949460202

00:23:14.440 --> 00:23:15.428 The better your acquisition,

NOTE Confidence: 0.949460202

00:23:15.428 --> 00:23:17.167 the better we're going to be able

NOTE Confidence: 0.949460202

00:23:17.167 --> 00:23:18.439 to kind of determine where that

NOTE Confidence: 0.949460202

00:23:18.439 --> 00:23:20.119 fiber is and where that fiber isn't,

NOTE Confidence: 0.949460202

00:23:20.120 --> 00:23:22.217 whether it's in 3D and in two D as

NOTE Confidence: 0.949460202

00:23:22.217 --> 00:23:24.311 well along the XY axis to make sure

NOTE Confidence: 0.949460202

00:23:24.311 --> 00:23:26.398 that we have the resolution there.

NOTE Confidence: 0.949460202

00:23:26.400 --> 00:23:27.755 And X&Y because sometimes people

NOTE Confidence: 0.949460202

00:23:27.755 --> 00:23:30.010 take an image at 512 by 512 and

NOTE Confidence: 0.949460202

00:23:30.010 --> 00:23:31.415 they're trying to render small

NOTE Confidence: 0.949460202

00:23:31.415 --> 00:23:33.061 little puncta and it's only defined

NOTE Confidence: 0.949460202

00:23:33.061 --> 00:23:34.597 by one or two pixels across.

NOTE Confidence: 0.949460202

00:23:34.600 --> 00:23:35.520 We can render it,

NOTE Confidence: 0.949460202

00:23:35.520 --> 00:23:36.440 we can identify it,

NOTE Confidence: 0.949460202

00:23:36.440 --> 00:23:37.372 we can render it,

NOTE Confidence: 0.949460202

00:23:37.372 --> 00:23:39.232 but we can render it better if it

NOTE Confidence: 0.949460202

00:23:39.232 --> 00:23:40.438 was 6 or 8 pixels across.

NOTE Confidence: 0.949460202

00:23:40.440 --> 00:23:41.400 And the higher resolution,

NOTE Confidence: 0.949460202

00:23:41.400 --> 00:23:43.174 we can really get a really fine

NOTE Confidence: 0.949460202

00:23:43.174 --> 00:23:44.860 control and measurement of the volume

NOTE Confidence: 0.949460202

00:23:44.860 --> 00:23:46.572 of those structures if we have more

NOTE Confidence: 0.949460202

00:23:46.572 --> 00:23:48.050 pixels to kind of render that object.

NOTE Confidence: 0.949460202

00:23:48.050 --> 00:23:49.550 And so that's all we're doing

NOTE Confidence: 0.949460202

00:23:49.550 --> 00:23:51.143 here with these smoothing factors

NOTE Confidence: 0.949460202

00:23:51.143 --> 00:23:52.719 and this background subtraction.

NOTE Confidence: 0.949460202

00:23:52.720 --> 00:23:55.213 These are tools we can use to kind of

NOTE Confidence: 0.949460202

00:23:55.213 --> 00:23:57.357 identify the labeling of the structure.

NOTE Confidence: 0.949460202

00:23:57.360 --> 00:23:58.104 And like I said,

NOTE Confidence: 0.949460202

00:23:58.104 --> 00:23:59.492 I'm not going to walk through a

NOTE Confidence: 0.949460202

00:23:59.492 --> 00:24:00.637 lot of the details specifically,

NOTE Confidence: 0.949460202

00:24:00.640 --> 00:24:02.159 but I do have these guys already

NOTE Confidence: 0.949460202

00:24:02.159 --> 00:24:02.593 created here.

NOTE Confidence: 0.949460202

00:24:02.600 --> 00:24:05.848 So this here is the basic intensity

NOTE Confidence: 0.949460202

00:24:05.848 --> 00:24:07.240 based surface structure.

NOTE Confidence: 0.949460202

00:24:07.240 --> 00:24:08.599 I'm going to zoom out a little bit here.

NOTE Confidence: 0.722404239

00:24:10.640 --> 00:24:11.120 Oh, you know what?

NOTE Confidence: 0.722404239

00:24:11.120 --> 00:24:11.840 I think I redid it here.

NOTE Confidence: 0.722404239

00:24:11.840 --> 00:24:13.433 Let me just let me just go through the

NOTE Confidence: 0.722404239

00:24:13.433 --> 00:24:15.036 wizard here just to show the final result.

NOTE Confidence: 0.722404239

00:24:15.040 --> 00:24:16.240 You can see how fast it is here.

NOTE Confidence: 0.722404239

00:24:16.240 --> 00:24:17.675 It's going to take this image here.

NOTE Confidence: 0.722404239

00:24:17.680 --> 00:24:18.996 It's not a super small data set,

NOTE Confidence: 0.722404239

00:24:19.000 --> 00:24:20.476 but it's also not super big.

NOTE Confidence: 0.722404239

00:24:20.480 --> 00:24:21.944 I'm going to change the color here so

NOTE Confidence: 0.722404239

00:24:21.944 --> 00:24:23.477 we can see it a little bit better.

NOTE Confidence: 0.722404239

00:24:23.480 --> 00:24:24.785 And so the visualization here

NOTE Confidence: 0.722404239

00:24:24.785 --> 00:24:26.400 in the surface was two ways.

NOTE Confidence: 0.722404239

00:24:26.400 --> 00:24:28.288 We talked about the 3D view and the

NOTE Confidence: 0.722404239

00:24:28.288 --> 00:24:30.320 slice view, kind of in a general sense,

NOTE Confidence: 0.722404239

00:24:30.320 --> 00:24:31.360 but in the 3D view,

NOTE Confidence: 0.722404239

00:24:31.360 --> 00:24:33.358 we can switch it to this.

NOTE Confidence: 0.722404239

00:24:33.360 --> 00:24:34.907 This is our 3D view and you

NOTE Confidence: 0.722404239

00:24:34.907 --> 00:24:36.675 can see the structure of these

NOTE Confidence: 0.722404239

00:24:36.675 --> 00:24:38.757 Microglia that we have created here.

NOTE Confidence: 0.722404239

00:24:38.760 --> 00:24:40.335 But we also have this little box

NOTE Confidence: 0.722404239

00:24:40.335 --> 00:24:41.679 here that switches to our slicer.

NOTE Confidence: 0.722404239

00:24:41.680 --> 00:24:44.560 It's a really powerful little tool in Mars.

NOTE Confidence: 0.722404239

00:24:44.560 --> 00:24:46.429 As you zoom into your data set

NOTE Confidence: 0.722404239

00:24:46.429 --> 00:24:47.720 during the creation process,

NOTE Confidence: 0.722404239

00:24:47.720 --> 00:24:49.015 where you're creating the border

NOTE Confidence: 0.722404239

00:24:49.015 --> 00:24:50.310 and selecting the pixels that

NOTE Confidence: 0.722404239

00:24:50.360 --> 00:24:51.240 make up your surface,

NOTE Confidence: 0.722404239

00:24:51.240 --> 00:24:52.720 you can visualize this outline.

NOTE Confidence: 0.722404239

00:24:52.720 --> 00:24:55.384 And this outline has a little

NOTE Confidence: 0.722404239

00:24:55.384 --> 00:24:57.668 there's a little ball chain here,

NOTE Confidence: 0.722404239

00:24:57.668 --> 00:24:59.880 Let's see if I can move it.

NOTE Confidence: 0.722404239

00:24:59.880 --> 00:25:00.852 If I click on this and

NOTE Confidence: 0.722404239

00:25:00.852 --> 00:25:01.800 move it left and right,

NOTE Confidence: 0.722404239

00:25:01.800 --> 00:25:03.228 I can go up and down through

NOTE Confidence: 0.722404239

00:25:03.228 --> 00:25:04.288 the Z stack and I can say,

NOTE Confidence: 0.722404239

00:25:04.288 --> 00:25:04.400 hey,

NOTE Confidence: 0.722404239

00:25:04.400 --> 00:25:06.234 those are the surfaces that were created.

NOTE Confidence: 0.722404239

00:25:06.240 --> 00:25:07.836 You can see the surface that

NOTE Confidence: 0.722404239

00:25:07.836 --> 00:25:09.219 we're rendering as based on

NOTE Confidence: 0.722404239

00:25:09.219 --> 00:25:10.519 the border of the structure.

NOTE Confidence: 0.722404239

00:25:10.520 --> 00:25:11.717 And so as we kind of go up and

NOTE Confidence: 0.722404239

00:25:11.717 --> 00:25:12.998 down and look at the surface here,

NOTE Confidence: 0.722404239

00:25:13.000 --> 00:25:15.450 you can see how it's rendering this

NOTE Confidence: 0.722404239

00:25:15.450 --> 00:25:17.390 structure and you can see exactly what's

NOTE Confidence: 0.722404239

00:25:17.390 --> 00:25:19.400 being included and what's not being included.

NOTE Confidence: 0.722404239

00:25:19.400 --> 00:25:20.096 Like for example,

NOTE Confidence: 0.722404239

00:25:20.096 --> 00:25:21.488 you can look at this structure

NOTE Confidence: 0.722404239

00:25:21.488 --> 00:25:22.879 right here and you can see it's,

NOTE Confidence: 0.722404239

00:25:22.880 --> 00:25:26.016 it's not and it's including this little

NOTE Confidence: 0.722404239

00:25:26.016 --> 00:25:29.636 area in between there as one big structure,

NOTE Confidence: 0.722404239

00:25:29.640 --> 00:25:29.818 right.

NOTE Confidence: 0.722404239

00:25:29.818 --> 00:25:30.886 It's not seeing this as a

NOTE Confidence: 0.722404239

00:25:30.886 --> 00:25:31.958 fiber here and a fiber here.

NOTE Confidence: 0.722404239

00:25:31.960 --> 00:25:33.418 Now that's partly based on the

NOTE Confidence: 0.722404239

00:25:33.418 --> 00:25:35.066 fact that the way I'm making

NOTE Confidence: 0.722404239

00:25:35.066 --> 00:25:36.611 this particular surface is using

NOTE Confidence: 0.722404239

00:25:36.611 --> 00:25:38.355 a broad intensity based surface

NOTE Confidence: 0.722404239

00:25:38.355 --> 00:25:39.875 with no background subtraction,

NOTE Confidence: 0.722404239

00:25:39.880 --> 00:25:41.494 just using a smoothing factor kind

NOTE Confidence: 0.722404239

00:25:41.494 --> 00:25:43.279 of create this surface and that's OK.

NOTE Confidence: 0.722404239

00:25:43.280 --> 00:25:44.200 There's nothing wrong with that.

NOTE Confidence: 0.722404239

00:25:44.200 --> 00:25:44.374 Obviously,

NOTE Confidence: 0.722404239

00:25:44.374 --> 00:25:45.592 you know you're going to get this

NOTE Confidence: 0.722404239

00:25:45.592 --> 00:25:46.520 little bit of an error here,

NOTE Confidence: 0.722404239

00:25:46.520 --> 00:25:47.815 but the rest of it works pretty

NOTE Confidence: 0.722404239

00:25:47.815 --> 00:25:49.279 good and you can get a good

NOTE Confidence: 0.722404239

00:25:49.279 --> 00:25:50.354 rest estimation of your volume.

NOTE Confidence: 0.722404239

00:25:50.360 --> 00:25:52.481 But you can see there's areas here

NOTE Confidence: 0.722404239

00:25:52.481 --> 00:25:54.106 where there's signal where maybe

NOTE Confidence: 0.722404239

00:25:54.106 --> 00:25:55.948 there shouldn't be any signal, right?

NOTE Confidence: 0.722404239

00:25:55.948 --> 00:25:57.076 We should not be selecting that.

NOTE Confidence: 0.722404239

00:25:57.080 --> 00:25:58.358 But because we did the smoothing,

NOTE Confidence: 0.722404239

00:25:58.360 --> 00:26:00.040 we set the threshold relatively low,

NOTE Confidence: 0.722404239

00:26:00.040 --> 00:26:01.640 We want to kind of make this surface,

NOTE Confidence: 0.722404239

00:26:01.640 --> 00:26:03.380 we have these kind of inconsistencies

NOTE Confidence: 0.722404239

00:26:03.380 --> 00:26:05.080 in some of these surfaces.

NOTE Confidence: 0.722404239

00:26:05.080 --> 00:26:06.520 And it just depends on the data set.

NOTE Confidence: 0.722404239

00:26:06.520 --> 00:26:08.077 Sometimes it's a really nice way to do it,

NOTE Confidence: 0.722404239

00:26:08.080 --> 00:26:09.664 especially if you have a nice

NOTE Confidence: 0.722404239

00:26:09.664 --> 00:26:11.205 thick Soma in this particular

NOTE Confidence: 0.722404239

00:26:11.205 --> 00:26:13.315 example that's labeled really well.

NOTE Confidence: 0.722404239

00:26:13.320 --> 00:26:15.196 You know, it's not, there's no gaps,

NOTE Confidence: 0.83456034375

00:26:15.200 --> 00:26:15.905 there's no holes,

NOTE Confidence: 0.83456034375

00:26:15.905 --> 00:26:17.080 there's no anything in there,

NOTE Confidence: 0.83456034375

00:26:17.080 --> 00:26:19.160 and it works really well.

NOTE Confidence: 0.83456034375

00:26:19.160 --> 00:26:21.275 The second method is to do the same sort

NOTE Confidence: 0.83456034375

00:26:21.275 --> 00:26:23.595 of thing with a little bit of smoothing,

NOTE Confidence: 0.83456034375

00:26:23.600 --> 00:26:25.226 but we're going to use what's

NOTE Confidence: 0.83456034375

00:26:25.226 --> 00:26:26.039 called background subtraction,

NOTE Confidence: 0.83456034375

00:26:26.040 --> 00:26:26.880 local background subtraction.

NOTE Confidence: 0.83456034375

00:26:26.880 --> 00:26:28.560 Again, I'm just going to just,

NOTE Confidence: 0.83456034375

00:26:28.560 --> 00:26:29.916 I'm going to zoom in here,

NOTE Confidence: 0.83456034375

00:26:29.920 --> 00:26:32.008 let me make this white so we can

NOTE Confidence: 0.83456034375

00:26:32.008 --> 00:26:34.117 see a little bit better, right?

NOTE Confidence: 0.83456034375

00:26:34.117 --> 00:26:36.610 I'm going to zoom in here and that same

NOTE Confidence: 0.83456034375

00:26:36.671 --> 00:26:39.199 area here where we were looking at before.

NOTE Confidence: 0.83456034375

00:26:39.200 --> 00:26:41.720 Now you can see I'm able to kind of identify

NOTE Confidence: 0.83456034375

00:26:41.786 --> 00:26:44.198 these little structures all by themselves.

NOTE Confidence: 0.83456034375

00:26:44.200 --> 00:26:46.840 Now I'm not including these areas.

NOTE Confidence: 0.83456034375

00:26:46.840 --> 00:26:48.020 So now these little areas

NOTE Confidence: 0.83456034375

00:26:48.020 --> 00:26:49.200 here are not being included.

NOTE Confidence: 0.83456034375

00:26:49.200 --> 00:26:52.880 Whereas if I go into this guy here,

NOTE Confidence: 0.83456034375

00:26:52.880 --> 00:26:55.554 we can look at these guys simultaneously,

NOTE Confidence: 0.83456034375

00:26:55.560 --> 00:26:56.760 see how different they are.

NOTE Confidence: 0.83456034375

00:26:56.760 --> 00:26:58.632 Let me change the color a little bit here.

NOTE Confidence: 0.83456034375

00:26:58.640 --> 00:26:59.720 This is a good example.

NOTE Confidence: 0.83456034375

00:26:59.720 --> 00:27:02.280 Make it pink, purple.

NOTE Confidence: 0.83456034375

00:27:02.280 --> 00:27:02.920 Here.

NOTE Confidence: 0.83456034375

00:27:02.920 --> 00:27:04.264 You can try to see exactly

NOTE Confidence: 0.83456034375

00:27:04.264 --> 00:27:05.160 where your border is.

NOTE Confidence: 0.83456034375

00:27:05.160 --> 00:27:06.879 You can see that they're not quite the same,

NOTE Confidence: 0.83456034375

00:27:06.880 --> 00:27:07.314 right?

NOTE Confidence: 0.83456034375

00:27:07.314 --> 00:27:09.918 Because now with the background subtraction,

NOTE Confidence: 0.83456034375

00:27:09.920 --> 00:27:11.387 we're able to kind of get a little bit

NOTE Confidence: 0.83456034375

00:27:11.387 --> 00:27:12.638 closer to the edge of the structure,

NOTE Confidence: 0.83456034375

00:27:12.640 --> 00:27:14.614 whereas with the smoothing only you can

NOTE Confidence: 0.83456034375

00:27:14.614 --> 00:27:16.520 see it's usually a little bit bigger,

NOTE Confidence: 0.83456034375

00:27:16.520 --> 00:27:17.753 little bit broader.

NOTE Confidence: 0.83456034375

00:27:17.753 --> 00:27:19.397 And the structure here,

NOTE Confidence: 0.83456034375

00:27:19.400 --> 00:27:21.220 it's selecting more of those

NOTE Confidence: 0.83456034375

00:27:21.220 --> 00:27:23.144 pictures on the edge within the

NOTE Confidence: 0.83456034375

00:27:23.144 --> 00:27:24.768 structure and we might not be able

NOTE Confidence: 0.83456034375

00:27:24.768 --> 00:27:26.622 to kind of get those small little

NOTE Confidence: 0.83456034375

00:27:26.622 --> 00:27:28.129 structures like even in here you

NOTE Confidence: 0.83456034375

00:27:28.129 --> 00:27:29.753 can see we're able to kind of get

NOTE Confidence: 0.83456034375

00:27:29.760 --> 00:27:31.278 these structures a little bit finer,

NOTE Confidence: 0.83456034375

00:27:31.280 --> 00:27:33.120 a little bit better control

NOTE Confidence: 0.83456034375

00:27:33.120 --> 00:27:34.592 where those edges are.

NOTE Confidence: 0.83456034375

00:27:34.600 --> 00:27:36.058 And so that's the second method

NOTE Confidence: 0.83456034375

00:27:36.058 --> 00:27:37.450 of making these surfaces using

NOTE Confidence: 0.83456034375

00:27:37.450 --> 00:27:38.560 that background subtraction.

NOTE Confidence: 0.83456034375

00:27:38.560 --> 00:27:39.880 Again, background subtraction.

NOTE Confidence: 0.83456034375

00:27:39.880 --> 00:27:43.020 And if we look at it in the

NOTE Confidence: 0.83456034375

00:27:43.020 --> 00:27:44.520 wizard here is this value here.

NOTE Confidence: 0.83456034375

00:27:44.520 --> 00:27:45.655 And it's just basically the

NOTE Confidence: 0.83456034375

00:27:45.655 --> 00:27:47.280 way I like to think about it,

NOTE Confidence: 0.83456034375

00:27:47.280 --> 00:27:48.757 is it's the size of the object

NOTE Confidence: 0.83456034375

00:27:48.757 --> 00:27:49.760 you're trying to render.

NOTE Confidence: 0.83456034375

00:27:49.760 --> 00:27:51.200 So if your object is about

NOTE Confidence: 0.83456034375

00:27:51.200 --> 00:27:52.720 half a Micron in diameter,

NOTE Confidence: 0.83456034375

00:27:52.720 --> 00:27:54.232 you're going to set this to half a Micron.

NOTE Confidence: 0.83456034375

00:27:54.240 --> 00:27:55.400 If it's about 1 Micron,

NOTE Confidence: 0.83456034375

00:27:55.400 --> 00:27:57.280 you're going to set it to 1 Micron.

NOTE Confidence: 0.83456034375

00:27:57.280 --> 00:27:58.995 And it does a local background subtraction.

NOTE Confidence: 0.83456034375

00:27:59.000 --> 00:28:00.300 So that's why it helps

NOTE Confidence: 0.83456034375

00:28:00.300 --> 00:28:01.080 identify these structures.

NOTE Confidence: 0.83456034375

00:28:01.080 --> 00:28:02.958 Now what I like to do,

NOTE Confidence: 0.83456034375

00:28:02.960 --> 00:28:04.380 and this is a good rule of thumb for a

NOTE Confidence: 0.83456034375

00:28:04.417 --> 00:28:05.796 lot of new users because you're like,

NOTE Confidence: 0.83456034375

00:28:05.800 --> 00:28:07.640 what did these actually do to my data?

NOTE Confidence: 0.83456034375

00:28:07.640 --> 00:28:09.452 Because you can see the image

NOTE Confidence: 0.83456034375

00:28:09.452 --> 00:28:11.034 here hasn't changed when I'm

NOTE Confidence: 0.83456034375

00:28:11.034 --> 00:28:12.719 processing these these values here,

NOTE Confidence: 0.83456034375

00:28:12.720 --> 00:28:14.344 you don't see the image change on

NOTE Confidence: 0.83456034375

00:28:14.344 --> 00:28:16.120 the screen and it's not going to when

NOTE Confidence: 0.83456034375

00:28:16.120 --> 00:28:17.320 you're processing it through the wizard.

NOTE Confidence: 0.83456034375

00:28:17.320 --> 00:28:20.160 But you might ask yourself what does a

NOTE Confidence: 0.83456034375

00:28:20.160 --> 00:28:22.680 smoothing factor of .13 do to my data?

NOTE Confidence: 0.83456034375

00:28:22.680 --> 00:28:23.800 Because that's the image,

NOTE Confidence: 0.83456034375

00:28:23.800 --> 00:28:24.640 that's the threshold.

NOTE Confidence: 0.83456034375

00:28:24.640 --> 00:28:25.949 When we get to this next step

NOTE Confidence: 0.83456034375

00:28:25.949 --> 00:28:26.880 here in the wizard,

NOTE Confidence: 0.83456034375

00:28:26.880 --> 00:28:28.524 this threshold that that's generated here

NOTE Confidence: 0.83456034375

00:28:28.524 --> 00:28:30.760 is based on that background subtraction,

NOTE Confidence: 0.83456034375

00:28:30.760 --> 00:28:32.000 that smoothing whatever values

NOTE Confidence: 0.83456034375

00:28:32.000 --> 00:28:34.392 you put into that, into those,

NOTE Confidence: 0.83456034375

00:28:34.392 --> 00:28:36.120 into those algorithms.

NOTE Confidence: 0.926045786666667

00:28:36.120 --> 00:28:37.944 And so the idea is that what is

NOTE Confidence: 0.926045786666667

00:28:37.944 --> 00:28:39.519 that actually doing to my data set?

NOTE Confidence: 0.926045786666667

00:28:39.520 --> 00:28:41.380 So what I like to show people a lot of

NOTE Confidence: 0.926045786666667

00:28:41.439 --> 00:28:43.383 times is I go to this image proc window

NOTE Confidence: 0.926045786666667

00:28:43.383 --> 00:28:45.240 just for just for a preview, right.

NOTE Confidence: 0.926045786666667

00:28:45.240 --> 00:28:47.714 And the idea is that the top

NOTE Confidence: 0.926045786666667

00:28:47.714 --> 00:28:49.399 view is your original data,

NOTE Confidence: 0.926045786666667

00:28:49.400 --> 00:28:52.200 the bottom view is the processed data.

NOTE Confidence: 0.926045786666667

00:28:52.200 --> 00:28:53.642 So I'm going to switch this to

NOTE Confidence: 0.926045786666667

00:28:53.642 --> 00:28:55.082 slice view kind of like to see

NOTE Confidence: 0.926045786666667

00:28:55.082 --> 00:28:56.240 it in the best possible way.

NOTE Confidence: 0.926045786666667

00:28:56.240 --> 00:28:57.759 I'm going to zoom in here actually.

NOTE Confidence: 0.926045786666667

00:28:57.760 --> 00:28:58.957 Let me do that one more time.

NOTE Confidence: 0.926045786666667

00:28:58.960 --> 00:29:01.640 I did that wrong. Sorry.

NOTE Confidence: 0.926045786666667

00:29:01.640 --> 00:29:05.312 Close that up. Image proc slice view.

NOTE Confidence: 0.926045786666667

00:29:05.312 --> 00:29:07.161 Here we go. Right.

NOTE Confidence: 0.926045786666667

00:29:07.161 --> 00:29:08.607 So you have these two images

NOTE Confidence: 0.926045786666667

00:29:08.607 --> 00:29:09.840 here that they're identical.

NOTE Confidence: 0.926045786666667

00:29:09.840 --> 00:29:11.766 The the the image on the top and the

NOTE Confidence: 0.926045786666667

00:29:11.766 --> 00:29:13.962 image on the bottom are they should be

NOTE Confidence: 0.926045786666667

00:29:13.962 --> 00:29:15.360 identical and they're not identical.

NOTE Confidence: 0.758036673636364

00:29:21.800 --> 00:29:24.272 Here we go. So the top and the

NOTE Confidence: 0.758036673636364

00:29:24.272 --> 00:29:26.069 bottom are identical, right?

NOTE Confidence: 0.758036673636364

00:29:26.069 --> 00:29:28.861 Visually, if I come up here and I

NOTE Confidence: 0.758036673636364

00:29:28.861 --> 00:29:31.303 click on the Gaussian filter and I

NOTE Confidence: 0.758036673636364

00:29:31.303 --> 00:29:33.719 do .13 which is a single pixel width,

NOTE Confidence: 0.758036673636364

00:29:33.720 --> 00:29:35.240 you can see the image at the top,

NOTE Confidence: 0.758036673636364

00:29:35.240 --> 00:29:36.920 which is your original image,

NOTE Confidence: 0.758036673636364

00:29:36.920 --> 00:29:37.736 it starts to look like the

NOTE Confidence: 0.758036673636364

00:29:37.736 --> 00:29:38.280 image at the bottom.

NOTE Confidence: 0.758036673636364

00:29:38.280 --> 00:29:39.792 You can see it gets a little bit blurry,

NOTE Confidence: 0.758036673636364

00:29:39.800 --> 00:29:40.667 all these pixels.

NOTE Confidence: 0.758036673636364

00:29:40.667 --> 00:29:42.690 That basically what a Gaussian blur does

NOTE Confidence: 0.758036673636364

00:29:42.742 --> 00:29:44.574 is it reduces the pixel variation so you

NOTE Confidence: 0.758036673636364

00:29:44.574 --> 00:29:46.879 get a little bit of a smoother transition.

NOTE Confidence: 0.758036673636364

00:29:46.880 --> 00:29:48.700 So again, all those post processing tools

NOTE Confidence: 0.758036673636364

00:29:48.700 --> 00:29:50.598 out there that acquisition systems do,

NOTE Confidence: 0.758036673636364

00:29:50.600 --> 00:29:51.164 that's essentially kind

NOTE Confidence: 0.758036673636364

00:29:51.164 --> 00:29:51.916 of what they're doing,

NOTE Confidence: 0.758036673636364

00:29:51.920 --> 00:29:53.160 a little bit fancier algorithm.

NOTE Confidence: 0.758036673636364

00:29:53.160 --> 00:29:55.379 But Gaussian smoothing blur is kind of

NOTE Confidence: 0.758036673636364

00:29:55.379 --> 00:29:57.654 the default for years to kind of blur

NOTE Confidence: 0.758036673636364

00:29:57.654 --> 00:30:00.038 that image so that we have a little bit,

NOTE Confidence: 0.758036673636364

00:30:00.040 --> 00:30:01.732 way better way of selecting the

NOTE Confidence: 0.758036673636364

00:30:01.732 --> 00:30:03.838 pixels that are part of our structure.

NOTE Confidence: 0.758036673636364

00:30:03.840 --> 00:30:05.718 Now that is the gusting point.

NOTE Confidence: 0.758036673636364

00:30:05.720 --> 00:30:06.872 Now, if I were to take this and say,

NOTE Confidence: 0.758036673636364

00:30:06.880 --> 00:30:09.640 hey, I want to, if I set this to like .3,

NOTE Confidence: 0.758036673636364

00:30:09.640 --> 00:30:11.160 which is closer to double the box slide,

NOTE Confidence: 0.758036673636364

00:30:11.160 --> 00:30:12.448 all of a sudden now things get

NOTE Confidence: 0.758036673636364

00:30:12.448 --> 00:30:13.560 a little bit blurry here.

NOTE Confidence: 0.758036673636364

00:30:13.560 --> 00:30:14.736 Now we don't see this inside

NOTE Confidence: 0.758036673636364

00:30:14.736 --> 00:30:15.520 a little bit much.

NOTE Confidence: 0.758036673636364

00:30:15.520 --> 00:30:17.158 We don't see the edges clear.

NOTE Confidence: 0.758036673636364

00:30:17.160 --> 00:30:18.800 It's kind of blurring that edge a little,

NOTE Confidence: 0.758036673636364

00:30:18.800 --> 00:30:19.721 a little bit.

NOTE Confidence: 0.758036673636364

00:30:19.721 --> 00:30:21.256 Especially when you have another

NOTE Confidence: 0.758036673636364

00:30:21.256 --> 00:30:22.519 fluorescence in your tissue,

NOTE Confidence: 0.758036673636364

00:30:22.520 --> 00:30:24.564 you're going to get a blurrier edge

NOTE Confidence: 0.758036673636364

00:30:24.564 --> 00:30:26.160 around your structure a little bit.

NOTE Confidence: 0.758036673636364

00:30:26.160 --> 00:30:26.736 And so again,

NOTE Confidence: 0.758036673636364

00:30:26.736 --> 00:30:28.080 as you go higher and higher here,

NOTE Confidence: 0.758036673636364

00:30:28.080 --> 00:30:29.230 obviously you're going to get

NOTE Confidence: 0.758036673636364

00:30:29.230 --> 00:30:30.096 blurrier and blurrier, right?

NOTE Confidence: 0.758036673636364

00:30:30.096 --> 00:30:30.800 The more you go,

NOTE Confidence: 0.758036673636364

00:30:30.800 --> 00:30:31.718 the blurrier it's going to get.

NOTE Confidence: 0.758036673636364

00:30:31.720 --> 00:30:31.903 Obviously,

NOTE Confidence: 0.758036673636364

00:30:31.903 --> 00:30:33.184 you're not going to go this side

NOTE Confidence: 0.758036673636364

00:30:33.184 --> 00:30:34.252 because now all of a sudden you

NOTE Confidence: 0.758036673636364

00:30:34.252 --> 00:30:35.339 can kind of see your the structure

NOTE Confidence: 0.758036673636364

00:30:35.339 --> 00:30:36.775 is still there, but again very,

NOTE Confidence: 0.758036673636364

00:30:36.775 --> 00:30:38.200 very little detail is there.

NOTE Confidence: 0.758036673636364

00:30:38.200 --> 00:30:39.159 So you're not going to make a

NOTE Confidence: 0.758036673636364

00:30:39.159 --> 00:30:39.879 surface to something like that.

NOTE Confidence: 0.758036673636364

00:30:39.880 --> 00:30:40.302 But again,

NOTE Confidence: 0.758036673636364

00:30:40.302 --> 00:30:41.568 there are cases where you might

NOTE Confidence: 0.758036673636364

00:30:41.568 --> 00:30:43.036 go high on the smoothing just to

NOTE Confidence: 0.758036673636364

00:30:43.036 --> 00:30:44.368 kind of make a surface rendering

NOTE Confidence: 0.758036673636364

00:30:44.368 --> 00:30:46.120 of something that maybe is not

NOTE Confidence: 0.758036673636364

00:30:46.120 --> 00:30:46.996 labeled perfectly uniformly.

NOTE Confidence: 0.758036673636364

00:30:47.000 --> 00:30:48.335 Sometimes blurring helps kind of

NOTE Confidence: 0.758036673636364

00:30:48.335 --> 00:30:49.992 render that objects as a usually

NOTE Confidence: 0.758036673636364

00:30:49.992 --> 00:30:51.357 for larger object works OK.

NOTE Confidence: 0.758036673636364

00:30:51.360 --> 00:30:52.640 So I'm going to come back down here.

NOTE Confidence: 0.758036673636364

00:30:52.640 --> 00:30:54.550 We're going to set this back to .25,

NOTE Confidence: 0.758036673636364

00:30:54.550 --> 00:30:55.240 something like that.

NOTE Confidence: 0.758036673636364

00:30:55.240 --> 00:30:57.091 And so the idea is that if you

NOTE Confidence: 0.758036673636364

00:30:57.091 --> 00:30:58.357 do a little bit of smoothing,

NOTE Confidence: 0.758036673636364

00:30:58.360 --> 00:31:00.180 the next step that we have is

NOTE Confidence: 0.758036673636364

00:31:00.180 --> 00:31:00.960 that background subtraction.

NOTE Confidence: 0.758036673636364

00:31:00.960 --> 00:31:02.320 So that background subtraction

NOTE Confidence: 0.758036673636364

00:31:02.320 --> 00:31:03.680 is this guy here.

NOTE Confidence: 0.758036673636364

00:31:03.680 --> 00:31:06.368 So this background subtraction,

NOTE Confidence: 0.758036673636364

00:31:06.368 --> 00:31:07.997 again, usually the defaults,

NOTE Confidence: 0.758036673636364

00:31:07.997 --> 00:31:09.592 it comes out to something

NOTE Confidence: 0.758036673636364

00:31:09.592 --> 00:31:10.600 usually pretty small,

NOTE Confidence: 0.758036673636364

00:31:10.600 --> 00:31:11.460 but the software doesn't really

NOTE Confidence: 0.758036673636364

00:31:11.460 --> 00:31:12.560 know what you're trying to render.

NOTE Confidence: 0.758036673636364

00:31:12.560 --> 00:31:13.392 Could be something big.

NOTE Confidence: 0.758036673636364

00:31:13.392 --> 00:31:14.432 It could be something small.

NOTE Confidence: 0.758036673636364

00:31:14.440 --> 00:31:15.304 Doesn't really know.

NOTE Confidence: 0.758036673636364

00:31:15.304 --> 00:31:17.800 So don't use these numbers just by default.

NOTE Confidence: 0.758036673636364

00:31:17.800 --> 00:31:19.438 These guys are about a Micron,

NOTE Confidence: 0.758036673636364

00:31:19.440 --> 00:31:21.120 Micron and 1/2 in diameter.

NOTE Confidence: 0.758036673636364

00:31:21.120 --> 00:31:22.600 So I'm going to set this to like

NOTE Confidence: 0.758036673636364

00:31:22.600 --> 00:31:24.082 1.5 and look what happens when

NOTE Confidence: 0.758036673636364

00:31:24.082 --> 00:31:25.360 you set it to 1.5.

NOTE Confidence: 0.758036673636364

00:31:25.360 --> 00:31:26.760 All of a sudden now your image

NOTE Confidence: 0.758036673636364

00:31:26.760 --> 00:31:27.360 looks like this.

NOTE Confidence: 0.892034344

00:31:27.360 --> 00:31:28.760 Now again, the adjustment is a little

NOTE Confidence: 0.892034344

00:31:28.760 --> 00:31:30.560 bit off here, so we can adjust it.

NOTE Confidence: 0.892034344

00:31:30.560 --> 00:31:31.520 We can look at the adjustment,

NOTE Confidence: 0.892034344

00:31:31.520 --> 00:31:33.552 but now all of a sudden now we've

NOTE Confidence: 0.892034344

00:31:33.552 --> 00:31:35.680 cleaned up all this auto fluorescence,

NOTE Confidence: 0.892034344

00:31:35.680 --> 00:31:37.920 all this little, all these pixels in here,

NOTE Confidence: 0.892034344

00:31:37.920 --> 00:31:39.691 they've been kind of reduced to next

NOTE Confidence: 0.892034344

00:31:39.691 --> 00:31:41.240 to nothing because it's background.

NOTE Confidence: 0.892034344

00:31:41.240 --> 00:31:43.082 It does this local background subtraction

NOTE Confidence: 0.892034344

00:31:43.082 --> 00:31:44.998 pixel by pixel across the data set.

NOTE Confidence: 0.892034344

00:31:45.000 --> 00:31:46.450 What that does, again depending

NOTE Confidence: 0.892034344

00:31:46.450 --> 00:31:48.320 on what you're trying to render,

NOTE Confidence: 0.892034344

00:31:48.320 --> 00:31:49.920 what that does is it allows you to

NOTE Confidence: 0.892034344

00:31:49.920 --> 00:31:51.511 find the edge of this surface and

NOTE Confidence: 0.892034344

00:31:51.511 --> 00:31:53.065 the edge of this surface relative

NOTE Confidence: 0.892034344

00:31:53.065 --> 00:31:54.517 to the surrounding background.

NOTE Confidence: 0.892034344

00:31:54.520 --> 00:31:56.560 And so when you go to make a

NOTE Confidence: 0.892034344

00:31:56.560 --> 00:31:58.497 surface and select the pixels that

NOTE Confidence: 0.892034344

00:31:58.497 --> 00:32:00.197 are part of this surface,

NOTE Confidence: 0.892034344

00:32:00.200 --> 00:32:01.600 this is what it's going to look for.

NOTE Confidence: 0.892034344

00:32:01.600 --> 00:32:02.678 These pixels are going to be really,

NOTE Confidence: 0.892034344

00:32:02.680 --> 00:32:03.044 really dim.

NOTE Confidence: 0.892034344

00:32:03.044 --> 00:32:04.318 These pixels are going to be really,

NOTE Confidence: 0.892034344

00:32:04.320 --> 00:32:04.790 really bright.

NOTE Confidence: 0.892034344

00:32:04.790 --> 00:32:06.435 It's going to be really easy to

NOTE Confidence: 0.892034344

00:32:06.435 --> 00:32:08.039 identify those pixels from these pixels.

NOTE Confidence: 0.892034344

00:32:08.040 --> 00:32:08.900 Same thing with this little

NOTE Confidence: 0.892034344

00:32:08.900 --> 00:32:09.760 thing in the middle here,

NOTE Confidence: 0.892034344

00:32:09.760 --> 00:32:11.227 all of a sudden now we have some pixels

NOTE Confidence: 0.892034344

00:32:11.227 --> 00:32:12.798 in there that are clearly really dark.

NOTE Confidence: 0.892034344

00:32:12.800 --> 00:32:13.095 Here.

NOTE Confidence: 0.892034344

00:32:13.095 --> 00:32:14.570 It's mostly background and there

NOTE Confidence: 0.892034344

00:32:14.570 --> 00:32:16.240 are some bright pixels in there.

NOTE Confidence: 0.892034344

00:32:16.240 --> 00:32:17.528 If I didn't do a whole lot

NOTE Confidence: 0.892034344

00:32:17.528 --> 00:32:18.080 of smoothing there,

NOTE Confidence: 0.892034344

00:32:18.080 --> 00:32:19.520 I'm going to select some of those pixels.

NOTE Confidence: 0.892034344

00:32:19.520 --> 00:32:20.857 It's going to be a little bit

NOTE Confidence: 0.892034344

00:32:20.857 --> 00:32:22.078 broader than what it needs to be.

NOTE Confidence: 0.892034344

00:32:22.080 --> 00:32:25.398 So again, the pixel classification here,

NOTE Confidence: 0.892034344

00:32:25.400 --> 00:32:26.340 the background subtraction depends

NOTE Confidence: 0.892034344

00:32:26.340 --> 00:32:28.480 and you can see as I make that small,

NOTE Confidence: 0.892034344

00:32:28.480 --> 00:32:30.272 you see things get a little bit smaller

NOTE Confidence: 0.892034344

00:32:30.272 --> 00:32:31.680 because it's looking at a smaller,

NOTE Confidence: 0.892034344

00:32:31.680 --> 00:32:33.378 it's doing a smaller background subtraction

NOTE Confidence: 0.892034344

00:32:33.378 --> 00:32:35.399 looking at that what that background is.

NOTE Confidence: 0.892034344

00:32:35.400 --> 00:32:36.720 So it's identifying those structures.

NOTE Confidence: 0.892034344

00:32:36.720 --> 00:32:37.300 And again,

NOTE Confidence: 0.892034344

00:32:37.300 --> 00:32:39.040 it's a single threshold value here.

NOTE Confidence: 0.892034344

00:32:39.040 --> 00:32:39.486 But again,

NOTE Confidence: 0.892034344

00:32:39.486 --> 00:32:41.047 if you know that the fibers are

NOTE Confidence: 0.892034344

00:32:41.047 --> 00:32:42.923 all about the same diameter or

NOTE Confidence: 0.892034344

00:32:42.923 --> 00:32:44.199 approximately the same diameter,

NOTE Confidence: 0.892034344

00:32:44.200 --> 00:32:45.760 so this is a nice way to kind of remove

NOTE Confidence: 0.892034344

00:32:45.800 --> 00:32:47.192 this pixelated noise with all these

NOTE Confidence: 0.892034344

00:32:47.192 --> 00:32:48.760 bright pixels out here that we really,

NOTE Confidence: 0.892034344

00:32:48.760 --> 00:32:49.724 don't really care for.

NOTE Confidence: 0.892034344

00:32:49.724 --> 00:32:51.170 We don't want to render them

NOTE Confidence: 0.892034344

00:32:51.225 --> 00:32:52.597 when we get to the next step.

NOTE Confidence: 0.892034344

00:32:52.600 --> 00:32:53.760 And so those are, that's what it's doing.

NOTE Confidence: 0.892034344

00:32:53.760 --> 00:32:55.240 So I do that and I scan a lot of it.

NOTE Confidence: 0.892034344

00:32:55.240 --> 00:32:55.732 It's like, Oh yeah,

NOTE Confidence: 0.892034344

00:32:55.732 --> 00:32:56.640 I'm going to set this to 1:00,

NOTE Confidence: 0.892034344

00:32:56.640 --> 00:32:58.075 I'm going to set this to whatever,

NOTE Confidence: 0.892034344

00:32:58.080 --> 00:32:59.720 and it gives me an idea of exactly

NOTE Confidence: 0.892034344

00:32:59.720 --> 00:33:01.160 what it's doing to my data set.

NOTE Confidence: 0.892034344

00:33:01.160 --> 00:33:03.095 And so those are the two methods for kind

NOTE Confidence: 0.892034344

00:33:03.095 --> 00:33:04.856 of doing kind of a testy base creation.

NOTE Confidence: 0.892034344

00:33:04.856 --> 00:33:07.027 Now I I want to spend a little bit of

NOTE Confidence: 0.892034344

00:33:07.027 --> 00:33:08.726 time on the new feature of a Morris

NOTE Confidence: 0.892034344

00:33:08.726 --> 00:33:10.480 that is using pixel classification.

NOTE Confidence: 0.892034344

00:33:10.480 --> 00:33:12.838 So the idea of pixel classification,

NOTE Confidence: 0.892034344

00:33:12.840 --> 00:33:16.462 it combines a little bit of both kind

NOTE Confidence: 0.892034344

00:33:16.462 --> 00:33:19.596 of the blurring of the image and the

NOTE Confidence: 0.892034344

00:33:19.596 --> 00:33:21.682 creation of kind of a fine structure

NOTE Confidence: 0.892034344

00:33:21.682 --> 00:33:23.697 around the edge of where your signal

NOTE Confidence: 0.892034344

00:33:23.697 --> 00:33:25.680 is and where your background is.

NOTE Confidence: 0.892034344

00:33:25.680 --> 00:33:27.320 But the difference here is

NOTE Confidence: 0.892034344

00:33:27.320 --> 00:33:28.960 that you're going to train,

NOTE Confidence: 0.892034344

00:33:28.960 --> 00:33:30.340 you're going to identify

NOTE Confidence: 0.892034344

00:33:30.340 --> 00:33:31.720 based on selecting pixels.

NOTE Confidence: 0.804067666666667

00:33:31.720 --> 00:33:32.956 So not based on a blur,

NOTE Confidence: 0.804067666666667

00:33:32.960 --> 00:33:34.440 not based on anything else.

NOTE Confidence: 0.804067666666667

00:33:34.440 --> 00:33:35.710 You're going to go in there and say, hey,

NOTE Confidence: 0.804067666666667

00:33:35.710 --> 00:33:37.600 you know what these pixels are Background,

NOTE Confidence: 0.804067666666667

00:33:37.600 --> 00:33:38.960 these pixels are signal,

NOTE Confidence: 0.804067666666667

00:33:38.960 --> 00:33:41.000 make my surface based on that.

NOTE Confidence: 0.804067666666667

00:33:41.000 --> 00:33:42.337 And so I'm going to walk you

NOTE Confidence: 0.804067666666667

00:33:42.337 --> 00:33:43.596 through that real quick as to what

NOTE Confidence: 0.804067666666667

00:33:43.596 --> 00:33:44.617 I did here within this image.

NOTE Confidence: 0.804067666666667

00:33:44.617 --> 00:33:46.319 I already kind of did it with this image.

NOTE Confidence: 0.804067666666667

00:33:46.320 --> 00:33:47.280 So I'm not going to read,

NOTE Confidence: 0.804067666666667

00:33:47.280 --> 00:33:48.512 I'm not going to reinvent the wheel

NOTE Confidence: 0.804067666666667

00:33:48.512 --> 00:33:49.999 here to kind of show you how it works,

NOTE Confidence: 0.804067666666667

00:33:50.000 --> 00:33:50.600 but I'm going to show you,

NOTE Confidence: 0.804067666666667

00:33:50.600 --> 00:33:52.048 you're going to be able to see exactly

NOTE Confidence: 0.804067666666667

00:33:52.048 --> 00:33:53.439 where I drew within the data set.

NOTE Confidence: 0.804067666666667

00:33:53.440 --> 00:33:54.490 And again, we're going to kind

NOTE Confidence: 0.804067666666667

00:33:54.490 --> 00:33:55.400 of just walk through here.

NOTE Confidence: 0.804067666666667

00:33:55.400 --> 00:33:56.485 We're going to choose our

NOTE Confidence: 0.804067666666667

00:33:56.485 --> 00:33:57.353 green or red channel.

NOTE Confidence: 0.804067666666667

00:33:57.360 --> 00:33:58.560 I didn't do any smoothing here.

NOTE Confidence: 0.804067666666667

00:33:58.560 --> 00:34:00.560 You could do some smoothing.

NOTE Confidence: 0.804067666666667

00:34:00.560 --> 00:34:03.293 The smoothing is a post smoothing

NOTE Confidence: 0.804067666666667

00:34:03.293 --> 00:34:05.358 process of the end result,

NOTE Confidence: 0.804067666666667

00:34:05.360 --> 00:34:05.838 but again,

NOTE Confidence: 0.804067666666667

00:34:05.838 --> 00:34:07.272 when I do fine structures I

NOTE Confidence: 0.804067666666667

00:34:07.272 --> 00:34:08.720 often do turn it off again.

NOTE Confidence: 0.804067666666667

00:34:08.720 --> 00:34:09.987 It just depends on the data set

NOTE Confidence: 0.804067666666667

00:34:09.987 --> 00:34:11.061 whether you're going to have this

NOTE Confidence: 0.804067666666667

00:34:11.061 --> 00:34:12.039 turned on or turned on again.

NOTE Confidence: 0.804067666666667

00:34:12.040 --> 00:34:13.960 When I'm doing nice fine structures,

NOTE Confidence: 0.804067666666667

00:34:13.960 --> 00:34:16.144 punctive processes often,

NOTE Confidence: 0.804067666666667

00:34:16.144 --> 00:34:18.228 especially for the the

NOTE Confidence: 0.804067666666667

00:34:18.228 --> 00:34:19.798 machine learning part of it,

NOTE Confidence: 0.804067666666667

00:34:19.800 --> 00:34:21.318 I do sometimes turn this off.

NOTE Confidence: 0.804067666666667

00:34:21.320 --> 00:34:22.916 Now for the the intensity base,

NOTE Confidence: 0.804067666666667

00:34:22.920 --> 00:34:24.438 I rarely turn the smoothing off.

NOTE Confidence: 0.804067666666667

00:34:24.440 --> 00:34:26.519 It's almost always on in some way,

NOTE Confidence: 0.804067666666667

00:34:26.520 --> 00:34:27.156 shape or form.

NOTE Confidence: 0.804067666666667

00:34:27.156 --> 00:34:28.640 But we're going to come in here.

NOTE Confidence: 0.804067666666667

00:34:28.640 --> 00:34:29.718 We're going to do the machine learning.

NOTE Confidence: 0.804067666666667

00:34:29.720 --> 00:34:31.477 I have two options with machine learning.

NOTE Confidence: 0.804067666666667

00:34:31.480 --> 00:34:33.841 One is you can do it on the red channel by

NOTE Confidence: 0.804067666666667

00:34:33.841 --> 00:34:35.440 itself or you can do it on all channels.

NOTE Confidence: 0.804067666666667

00:34:35.440 --> 00:34:36.388 Now why would you ever want

NOTE Confidence: 0.804067666666667

00:34:36.388 --> 00:34:37.600 to do it on all channels?

NOTE Confidence: 0.804067666666667

00:34:37.600 --> 00:34:39.600 All channels would be a a data set.

NOTE Confidence: 0.804067666666667

00:34:39.600 --> 00:34:40.116 For example,

NOTE Confidence: 0.804067666666667

00:34:40.116 --> 00:34:42.180 if you had a bright field data set

NOTE Confidence: 0.804067666666667

00:34:42.240 --> 00:34:44.585 that was RGB and you had maybe

NOTE Confidence: 0.804067666666667

00:34:44.585 --> 00:34:46.960 H&E stain or something like that,

NOTE Confidence: 0.804067666666667

00:34:46.960 --> 00:34:48.451 you would kind of do the machine

NOTE Confidence: 0.804067666666667

00:34:48.451 --> 00:34:49.800 learning on all three channels.

NOTE Confidence: 0.804067666666667

00:34:49.800 --> 00:34:51.342 And then you would train your

NOTE Confidence: 0.804067666666667

00:34:51.342 --> 00:34:53.039 purple cells or your brown cells,

NOTE Confidence: 0.804067666666667

00:34:53.040 --> 00:34:54.480 whatever is in that sample,

NOTE Confidence: 0.804067666666667

00:34:54.480 --> 00:34:56.040 to be signal and then everything

NOTE Confidence: 0.804067666666667

00:34:56.040 --> 00:34:57.080 else would be background.

NOTE Confidence: 0.804067666666667

00:34:57.080 --> 00:34:58.720 And then you can render cells within it.

NOTE Confidence: 0.804067666666667

00:34:58.720 --> 00:35:01.318 This kind of light microscopy world,

NOTE Confidence: 0.804067666666667

00:35:01.320 --> 00:35:05.344 kind of an H&E or type of Histology type

NOTE Confidence: 0.804067666666667

00:35:05.344 --> 00:35:08.960 slide where you kind of have an RGB channel,

NOTE Confidence: 0.804067666666667

00:35:08.960 --> 00:35:10.648 but you want to use the machine learning

NOTE Confidence: 0.804067666666667

00:35:10.648 --> 00:35:12.234 to kind of make the surfaces and

NOTE Confidence: 0.804067666666667

00:35:12.234 --> 00:35:13.840 count the cells and things like that.

NOTE Confidence: 0.804067666666667

00:35:13.840 --> 00:35:15.064 That would be a case where

NOTE Confidence: 0.804067666666667

00:35:15.064 --> 00:35:15.880 you'd use all channels.

NOTE Confidence: 0.804067666666667

00:35:15.880 --> 00:35:17.992 And there's some cases as well when you're

NOTE Confidence: 0.804067666666667

00:35:17.992 --> 00:35:19.224 doing fluorescent data imaging where

NOTE Confidence: 0.804067666666667

00:35:19.224 --> 00:35:21.160 you want it to use all channels as well.

NOTE Confidence: 0.804067666666667

00:35:21.160 --> 00:35:21.835 In this case,

NOTE Confidence: 0.804067666666667

00:35:21.835 --> 00:35:23.185 we don't because these are two

NOTE Confidence: 0.804067666666667

00:35:23.185 --> 00:35:24.279 totally different channels,

NOTE Confidence: 0.804067666666667

00:35:24.280 --> 00:35:24.958 totally labeled structures.

NOTE Confidence: 0.804067666666667

00:35:24.958 --> 00:35:26.797 We're just going to do it on the

NOTE Confidence: 0.804067666666667

00:35:26.797 --> 00:35:27.637 red channel by itself.

NOTE Confidence: 0.84178308375

00:35:30.960 --> 00:35:32.985 OK, so the main interface

NOTE Confidence: 0.84178308375

00:35:32.985 --> 00:35:34.200 is pretty straightforward.

NOTE Confidence: 0.84178308375

00:35:34.200 --> 00:35:36.264 If you've never done any kind

NOTE Confidence: 0.84178308375

00:35:36.264 --> 00:35:37.640 of pixel classification before,

NOTE Confidence: 0.84178308375

00:35:37.640 --> 00:35:40.360 the concept is pretty simple.

NOTE Confidence: 0.84178308375

00:35:40.360 --> 00:35:42.000 You have a foreground and

NOTE Confidence: 0.84178308375

00:35:42.000 --> 00:35:43.312 you have a background.

NOTE Confidence: 0.84178308375

00:35:43.320 --> 00:35:44.480 You have a draw tool.

NOTE Confidence: 0.84178308375

00:35:44.480 --> 00:35:45.957 In this case it's a little circle.

NOTE Confidence: 0.84178308375

00:35:45.960 --> 00:35:47.668 You can change the size of the

NOTE Confidence: 0.84178308375

00:35:47.668 --> 00:35:49.080 circle using the mouse wheel,

NOTE Confidence: 0.84178308375

00:35:49.080 --> 00:35:50.510 holding down the control key

NOTE Confidence: 0.84178308375

00:35:50.510 --> 00:35:52.350 and using the the mouse wheel

NOTE Confidence: 0.84178308375

00:35:52.350 --> 00:35:53.758 to control that structure.

NOTE Confidence: 0.84178308375

00:35:53.760 --> 00:35:55.452 If you do have a secondary

NOTE Confidence: 0.84178308375

00:35:55.452 --> 00:35:57.080 mouse wheel on your system,

NOTE Confidence: 0.84178308375

00:35:57.080 --> 00:35:58.832 this slicer mode that we have

NOTE Confidence: 0.84178308375

00:35:58.832 --> 00:36:00.519 controls this Z slice as well.

NOTE Confidence: 0.84178308375

00:36:00.520 --> 00:36:01.960 I didn't mention that earlier,

NOTE Confidence: 0.84178308375

00:36:01.960 --> 00:36:03.490 so we do recommend a specific

NOTE Confidence: 0.84178308375

00:36:03.490 --> 00:36:04.800 mouse on a requirements page.

NOTE Confidence: 0.84178308375

00:36:04.800 --> 00:36:07.560 It's AMX Master 3 from Logitech,

NOTE Confidence: 0.84178308375

00:36:07.560 --> 00:36:09.485 but any mouse that essentially

NOTE Confidence: 0.84178308375

00:36:09.485 --> 00:36:11.564 has a a secondary mouse wheel

NOTE Confidence: 0.84178308375

00:36:11.564 --> 00:36:12.796 can control this slicer.

NOTE Confidence: 0.84178308375

00:36:12.800 --> 00:36:14.240 No matter where you are and it's a really,

NOTE Confidence: 0.84178308375

00:36:14.240 --> 00:36:15.520 really nice convenient feature,

NOTE Confidence: 0.84178308375

00:36:15.520 --> 00:36:17.440 you can also do the keyboard

NOTE Confidence: 0.84178308375

00:36:17.440 --> 00:36:18.718 up and down arrows as well.

NOTE Confidence: 0.84178308375

00:36:18.720 --> 00:36:19.734 And you also you can always

NOTE Confidence: 0.84178308375

00:36:19.734 --> 00:36:20.967 click on this guy and move this

NOTE Confidence: 0.84178308375

00:36:20.967 --> 00:36:21.993 guy left and right as well.

NOTE Confidence: 0.84178308375

00:36:22.000 --> 00:36:23.155 There's three ways to kind

NOTE Confidence: 0.84178308375

00:36:23.155 --> 00:36:24.079 of change those size,

NOTE Confidence: 0.84178308375

00:36:24.080 --> 00:36:26.240 but the the mouse wheel is the nicest way.

NOTE Confidence: 0.84178308375

00:36:26.240 --> 00:36:28.112 So the idea here is I'm going to

NOTE Confidence: 0.84178308375

00:36:28.112 --> 00:36:30.200 try to find where I trained here.

NOTE Confidence: 0.84178308375

00:36:30.200 --> 00:36:32.570 So you can see here's some

NOTE Confidence: 0.84178308375

00:36:32.570 --> 00:36:34.372 strokes here you're going to see

NOTE Confidence: 0.84178308375

00:36:34.372 --> 00:36:35.637 these purple and green strokes.

NOTE Confidence: 0.84178308375

00:36:35.640 --> 00:36:38.436 So the purple strokes represent background,

NOTE Confidence: 0.84178308375

00:36:38.440 --> 00:36:40.400 the green strokes represent signal.

NOTE Confidence: 0.84178308375

00:36:40.400 --> 00:36:41.876 So you draw these strokes and

NOTE Confidence: 0.84178308375

00:36:41.876 --> 00:36:43.319 again you just come in here,

NOTE Confidence: 0.84178308375

00:36:43.320 --> 00:36:44.832 you're going to change the size of this

NOTE Confidence: 0.84178308375

00:36:44.832 --> 00:36:46.395 guy like this and you're going to say,

NOTE Confidence: 0.84178308375

00:36:46.400 --> 00:36:46.712 hey,

NOTE Confidence: 0.84178308375

00:36:46.712 --> 00:36:47.648 you know what,

NOTE Confidence: 0.84178308375

00:36:47.648 --> 00:36:49.790 hold down shift and you're going to

NOTE Confidence: 0.84178308375

00:36:49.790 --> 00:36:51.392 draw signal and then you hit train

NOTE Confidence: 0.84178308375

00:36:51.392 --> 00:36:53.086 and predict and you're going to train

NOTE Confidence: 0.84178308375

00:36:53.086 --> 00:36:54.514 different areas of your data set.

NOTE Confidence: 0.84178308375

00:36:54.520 --> 00:36:54.913 Again,

NOTE Confidence: 0.84178308375

00:36:54.913 --> 00:36:56.878 that to use pixel classification,

NOTE Confidence: 0.84178308375

00:36:56.880 --> 00:36:58.840 the basic rule of thumb is that

NOTE Confidence: 0.84178308375

00:36:58.840 --> 00:37:00.712 you're going to train a lot of

NOTE Confidence: 0.84178308375

00:37:00.712 --> 00:37:02.056 different areas in your data set

NOTE Confidence: 0.84178308375

00:37:02.056 --> 00:37:03.840 that have different types of signal.

NOTE Confidence: 0.84178308375

00:37:03.840 --> 00:37:05.360 Dim signal, bright signal,

NOTE Confidence: 0.84178308375

00:37:05.360 --> 00:37:06.874 high background, low background,

NOTE Confidence: 0.84178308375

00:37:06.874 --> 00:37:07.628 dirt, garbage.

NOTE Confidence: 0.84178308375

00:37:07.628 --> 00:37:09.513 Wherever you're going to train,

NOTE Confidence: 0.84178308375

00:37:09.520 --> 00:37:11.710 you're going to train this structure and

NOTE Confidence: 0.84178308375

00:37:11.710 --> 00:37:13.480 again you're going to train everywhere,

NOTE Confidence: 0.84178308375

00:37:13.480 --> 00:37:15.584 the soma, the processes,

NOTE Confidence: 0.84178308375

00:37:15.584 --> 00:37:17.092 the background, every everywhere.

NOTE Confidence: 0.84178308375

00:37:17.092 --> 00:37:19.503 So if we come up here and say you know

NOTE Confidence: 0.84178308375

00:37:19.503 --> 00:37:21.144 what that should be background, right.

NOTE Confidence: 0.84178308375

00:37:21.144 --> 00:37:22.200 This is not signal.

NOTE Confidence: 0.84178308375

00:37:22.200 --> 00:37:24.036 That's clearly background come up here,

NOTE Confidence: 0.84178308375

00:37:24.040 --> 00:37:24.714 click background,

NOTE Confidence: 0.84178308375

00:37:24.714 --> 00:37:27.073 come up here and we're going to

NOTE Confidence: 0.84178308375

00:37:27.073 --> 00:37:29.600 train it a little bit like that.

NOTE Confidence: 0.84178308375

00:37:29.600 --> 00:37:30.678 And you're going to hit train and

NOTE Confidence: 0.84178308375

00:37:30.678 --> 00:37:31.558 predict and you're going to see.

NOTE Confidence: 0.84178308375

00:37:31.560 --> 00:37:33.720 It's a pretty fast process to take that.

NOTE Confidence: 0.84178308375

00:37:33.720 --> 00:37:35.560 Just that one little training we did there.

NOTE Confidence: 0.84178308375

00:37:35.560 --> 00:37:37.054 It's going to recalculate everything just

NOTE Confidence: 0.84178308375

00:37:37.054 --> 00:37:38.759 based on training that little structure.

NOTE Confidence: 0.84178308375

00:37:38.760 --> 00:37:40.120 And all of a sudden now I have

NOTE Confidence: 0.84178308375

00:37:40.120 --> 00:37:41.691 a new signal and you can see

NOTE Confidence: 0.84178308375

00:37:41.691 --> 00:37:42.635 that may have changed,

NOTE Confidence: 0.84178308375

00:37:42.640 --> 00:37:44.240 not just this area here,

NOTE Confidence: 0.84178308375

00:37:44.240 --> 00:37:46.193 which now has no signal in that

NOTE Confidence: 0.84178308375

00:37:46.193 --> 00:37:47.679 little area that I trained,

NOTE Confidence: 0.84178308375

00:37:47.680 --> 00:37:49.108 but it may have changed some other

NOTE Confidence: 0.84178308375

00:37:49.108 --> 00:37:50.399 areas as well for the better.

NOTE Confidence: 0.84178308375

00:37:50.400 --> 00:37:51.444 Hopefully that's the goal

NOTE Confidence: 0.84178308375

00:37:51.444 --> 00:37:53.010 where maybe now it's picking up

NOTE Confidence: 0.855142235714286

00:37:53.063 --> 00:37:54.413 these little holes in here that

NOTE Confidence: 0.855142235714286

00:37:54.413 --> 00:37:55.850 it didn't pick up before, right?

NOTE Confidence: 0.855142235714286

00:37:55.850 --> 00:37:57.040 So you go through the data set,

NOTE Confidence: 0.855142235714286

00:37:57.040 --> 00:37:58.300 you go through the Z stack

NOTE Confidence: 0.855142235714286

00:37:58.300 --> 00:37:59.720 and you train the structures.

NOTE Confidence: 0.855142235714286

00:37:59.720 --> 00:38:00.917 Now if you look at here and you say,

NOTE Confidence: 0.855142235714286

00:38:00.920 --> 00:38:02.360 OK, well that's training a little

NOTE Confidence: 0.855142235714286

00:38:02.360 --> 00:38:04.000 bit too wide for my structure,

NOTE Confidence: 0.855142235714286

00:38:04.000 --> 00:38:05.640 that's OK, come in here and train it,

NOTE Confidence: 0.855142235714286

00:38:05.640 --> 00:38:07.050 come in here and train along

NOTE Confidence: 0.855142235714286

00:38:07.050 --> 00:38:08.560 here and draw the structure.

NOTE Confidence: 0.855142235714286

00:38:08.560 --> 00:38:11.969 Now the way our training works is

NOTE Confidence: 0.855142235714286

00:38:11.969 --> 00:38:14.559 that we're visualizing this slicer,

NOTE Confidence: 0.855142235714286

00:38:14.560 --> 00:38:16.672 this data, this volume and what's

NOTE Confidence: 0.855142235714286

00:38:16.672 --> 00:38:18.080 called an extended section.

NOTE Confidence: 0.855142235714286

00:38:18.080 --> 00:38:20.201 So down here at the bottom right

NOTE Confidence: 0.855142235714286

00:38:20.201 --> 00:38:22.319 hand corner you see this in

NOTE Confidence: 0.855142235714286

00:38:22.319 --> 00:38:23.835 extended section section here,

NOTE Confidence: 0.855142235714286

00:38:23.840 --> 00:38:26.504 the size of this is the size of that

NOTE Confidence: 0.855142235714286

00:38:26.504 --> 00:38:29.360 little yellow box you're seeing right here.

NOTE Confidence: 0.855142235714286

00:38:29.360 --> 00:38:30.240 The bigger you set it,

NOTE Confidence: 0.855142235714286

00:38:30.240 --> 00:38:31.680 the bigger that structure is going to be,

NOTE Confidence: 0.855142235714286

00:38:31.680 --> 00:38:33.472 the more you're going to see in terms

NOTE Confidence: 0.855142235714286

00:38:33.472 --> 00:38:35.596 of the the thickness of your structure.

NOTE Confidence: 0.855142235714286

00:38:35.600 --> 00:38:37.784 Now, the rule of thumb is that usually

NOTE Confidence: 0.855142235714286

00:38:37.784 --> 00:38:39.771 you're going to set this to about the

NOTE Confidence: 0.855142235714286

00:38:39.771 --> 00:38:42.040 size of the object you're trying to render,

NOTE Confidence: 0.855142235714286

00:38:42.040 --> 00:38:43.396 whether it's a process like this.

NOTE Confidence: 0.855142235714286

00:38:43.400 --> 00:38:45.320 That's about one or two microns in diameter.

NOTE Confidence: 0.855142235714286

00:38:45.320 --> 00:38:46.880 I might go as high as two microns.

NOTE Confidence: 0.855142235714286

00:38:46.880 --> 00:38:48.624 Not much more than that because I don't

NOTE Confidence: 0.855142235714286

00:38:48.624 --> 00:38:50.556 want to get too far into the structure.

NOTE Confidence: 0.855142235714286

00:38:50.560 --> 00:38:52.423 Because when I come in here and I look

NOTE Confidence: 0.855142235714286

00:38:52.423 --> 00:38:54.533 at my data and I'm trying to say, hey,

NOTE Confidence: 0.855142235714286

00:38:54.533 --> 00:38:57.197 what is signal and what is not signal?

NOTE Confidence: 0.855142235714286

00:38:57.200 --> 00:38:58.496 What is being trained and what

NOTE Confidence: 0.855142235714286

00:38:58.496 --> 00:38:59.360 is not being trained.

NOTE Confidence: 0.855142235714286

00:38:59.360 --> 00:39:02.348 What I see on the screen here is a

NOTE Confidence: 0.855142235714286

00:39:02.348 --> 00:39:04.572 maximum intensity projection of two

NOTE Confidence: 0.855142235714286

00:39:04.572 --> 00:39:07.840 microns worth of volume in my stack.

NOTE Confidence: 0.855142235714286

00:39:07.840 --> 00:39:09.800 When I train and I come over here and say,

NOTE Confidence: 0.855142235714286

00:39:09.800 --> 00:39:10.472 you know what,

NOTE Confidence: 0.855142235714286

00:39:10.472 --> 00:39:12.320 I want to train this process right here.

NOTE Confidence: 0.855142235714286

00:39:12.320 --> 00:39:14.000 I'm going to come over here and say,

NOTE Confidence: 0.855142235714286

00:39:14.000 --> 00:39:14.672 you know what,

NOTE Confidence: 0.855142235714286

00:39:14.672 --> 00:39:16.679 I want to train this process and do this.

NOTE Confidence: 0.855142235714286

00:39:16.680 --> 00:39:18.215 I'm only selecting the pixels

NOTE Confidence: 0.855142235714286

00:39:18.215 --> 00:39:20.280 that I see on the screen.

NOTE Confidence: 0.855142235714286

00:39:20.280 --> 00:39:22.712 Even though it might be 456 different

NOTE Confidence: 0.855142235714286

00:39:22.712 --> 00:39:24.392 slices kind of merged together

NOTE Confidence: 0.855142235714286

00:39:24.392 --> 00:39:26.799 in a Max intensity projection.

NOTE Confidence: 0.855142235714286

00:39:26.800 --> 00:39:29.890 I'm only selecting the brightest pixels

NOTE Confidence: 0.855142235714286

00:39:29.890 --> 00:39:33.440 in this slice in this stack of slices.

NOTE Confidence: 0.855142235714286

00:39:33.440 --> 00:39:35.078 So they could be various levels.

NOTE Confidence: 0.855142235714286

00:39:35.080 --> 00:39:36.528 And So what I like to try to

NOTE Confidence: 0.855142235714286

00:39:36.528 --> 00:39:37.924 show people sometimes let me hit

NOTE Confidence: 0.855142235714286

00:39:37.924 --> 00:39:39.394 train predict here one more time.

NOTE Confidence: 0.855142235714286

00:39:39.400 --> 00:39:41.152 There is an idea you can use this

NOTE Confidence: 0.855142235714286

00:39:41.152 --> 00:39:43.223 to kind of show you and hide what

NOTE Confidence: 0.855142235714286

00:39:43.223 --> 00:39:44.920 the what those training voxels are.

NOTE Confidence: 0.855142235714286

00:39:44.920 --> 00:39:46.120 So if I do show hide,

NOTE Confidence: 0.855142235714286

00:39:46.120 --> 00:39:47.562 I'm going to come right to this

NOTE Confidence: 0.855142235714286

00:39:47.562 --> 00:39:48.679 guy that I just did.

NOTE Confidence: 0.855142235714286

00:39:48.680 --> 00:39:49.826 I'm going to just rotate this

NOTE Confidence: 0.855142235714286

00:39:49.826 --> 00:39:51.238 twice here to put it on its side.

NOTE Confidence: 0.855142235714286

00:39:51.240 --> 00:39:52.344 I'm going to turn it sideways

NOTE Confidence: 0.855142235714286

00:39:52.344 --> 00:39:53.080 here a little bit,

NOTE Confidence: 0.82024083375

00:39:55.560 --> 00:39:57.320 and as I move this up and down,

NOTE Confidence: 0.82024083375

00:39:57.320 --> 00:40:00.443 you can see the pixels that it's choosing are

NOTE Confidence: 0.82024083375

00:40:00.443 --> 00:40:03.413 the pixels that are in that slice, right?

NOTE Confidence: 0.82024083375

00:40:03.413 --> 00:40:05.478 That are in that section.

NOTE Confidence: 0.82024083375

00:40:05.480 --> 00:40:07.320 This is my stroke from here to here,

NOTE Confidence: 0.82024083375

00:40:07.320 --> 00:40:09.558 but it's selecting the brightest pixels.

NOTE Confidence: 0.82024083375

00:40:09.560 --> 00:40:09.941 That are here.

NOTE Confidence: 0.82024083375

00:40:09.941 --> 00:40:11.318 They happen to be a hole in a single slice.

NOTE Confidence: 0.82024083375

00:40:11.320 --> 00:40:12.436 That wasn't a really good example.

NOTE Confidence: 0.82024083375

00:40:12.440 --> 00:40:13.720 Let me just look at another example here.

NOTE Confidence: 0.82024083375

00:40:13.720 --> 00:40:15.076 Here. This is a better example.

NOTE Confidence: 0.82024083375

00:40:15.080 --> 00:40:16.704 So you can see that the stroke

NOTE Confidence: 0.82024083375

00:40:16.704 --> 00:40:18.677 that I made was from here to here,

NOTE Confidence: 0.82024083375

00:40:18.680 --> 00:40:19.800 all the pixels it chose,

NOTE Confidence: 0.82024083375

00:40:19.800 --> 00:40:21.319 it chose that pixel and that pixel,

NOTE Confidence: 0.82024083375

00:40:21.320 --> 00:40:23.640 but it didn't choose that one and that

NOTE Confidence: 0.82024083375

00:40:23.640 --> 00:40:25.818 one because they're not visible within

NOTE Confidence: 0.82024083375

00:40:25.818 --> 00:40:27.638 the optical slice section, right?

NOTE Confidence: 0.82024083375

00:40:27.638 --> 00:40:29.584 And so you have this kind of

NOTE Confidence: 0.82024083375

00:40:29.584 --> 00:40:31.287 distribution of pixels only selecting

NOTE Confidence: 0.82024083375

00:40:31.287 --> 00:40:33.092 those brightest pixels within the

NOTE Confidence: 0.82024083375

00:40:33.092 --> 00:40:35.399 within the view that's in that section.

NOTE Confidence: 0.82024083375

00:40:35.400 --> 00:40:36.636 And so that's what it's selecting,

NOTE Confidence: 0.82024083375

00:40:36.640 --> 00:40:37.848 that's what it's training

NOTE Confidence: 0.82024083375

00:40:37.848 --> 00:40:39.358 as part of the algorithm.

NOTE Confidence: 0.82024083375

00:40:39.360 --> 00:40:40.949 So the size matters here in terms

NOTE Confidence: 0.82024083375

00:40:40.949 --> 00:40:42.877 of how big you want the structure.

NOTE Confidence: 0.82024083375

00:40:42.880 --> 00:40:45.238 Again, usually you keep it about,

NOTE Confidence: 0.82024083375

00:40:45.240 --> 00:40:46.997 I'd say the size of your structure,

NOTE Confidence: 0.82024083375

00:40:47.000 --> 00:40:48.967 in this case about 1 1/2 to

NOTE Confidence: 0.82024083375

00:40:48.967 --> 00:40:50.080 two microns or so.

NOTE Confidence: 0.82024083375

00:40:50.080 --> 00:40:50.888 It's probably be good,

NOTE Confidence: 0.82024083375

00:40:50.888 --> 00:40:52.360 but if you look at inside here,

NOTE Confidence: 0.82024083375

00:40:52.360 --> 00:40:53.830 you can see it's doing pretty good

NOTE Confidence: 0.82024083375

00:40:53.830 --> 00:40:55.374 job and see you can actually even

NOTE Confidence: 0.82024083375

00:40:55.374 --> 00:40:57.079 train in this mode if you want to.

NOTE Confidence: 0.82024083375

00:40:57.080 --> 00:40:58.835 If you wanted to come up here and say

NOTE Confidence: 0.82024083375

00:40:58.835 --> 00:41:00.079 you know what, this is background.

NOTE Confidence: 0.82024083375

00:41:00.079 --> 00:41:01.117 I want to cut a train.

NOTE Confidence: 0.82024083375

00:41:01.120 --> 00:41:02.856 I can train in this this author

NOTE Confidence: 0.82024083375

00:41:02.856 --> 00:41:03.600 slicer mode too.

NOTE Confidence: 0.82024083375

00:41:03.600 --> 00:41:05.313 I can train at any orientation.

NOTE Confidence: 0.82024083375

00:41:05.313 --> 00:41:07.817 I want to try to identify the structures

NOTE Confidence: 0.82024083375

00:41:07.817 --> 00:41:10.037 because depending on the data you might say,

NOTE Confidence: 0.82024083375

00:41:10.040 --> 00:41:10.800 oh, you know, it's not.

NOTE Confidence: 0.82024083375

00:41:10.800 --> 00:41:12.032 I didn't do a good job training

NOTE Confidence: 0.82024083375

00:41:12.032 --> 00:41:12.560 that bottom part,

NOTE Confidence: 0.82024083375

00:41:12.560 --> 00:41:13.640 I'm going to come in here and train that.

NOTE Confidence: 0.82024083375

00:41:13.640 --> 00:41:14.040 Bottom part,

NOTE Confidence: 0.82024083375

00:41:14.040 --> 00:41:15.440 you can come in and do that.

NOTE Confidence: 0.82024083375

00:41:15.440 --> 00:41:17.240 At any point you can come up here and say,

NOTE Confidence: 0.82024083375

00:41:17.240 --> 00:41:17.942 you know what,

NOTE Confidence: 0.82024083375

00:41:17.942 --> 00:41:19.960 some of this doesn't look like real signal.

NOTE Confidence: 0.82024083375

00:41:19.960 --> 00:41:22.000 I can come up here and say you know what,

NOTE Confidence: 0.82024083375

00:41:22.000 --> 00:41:23.035 maybe that's background,

NOTE Confidence: 0.82024083375

00:41:23.035 --> 00:41:25.960 do that and then hit train and predict

NOTE Confidence: 0.82024083375

00:41:25.960 --> 00:41:28.012 and kind of get that section done.

NOTE Confidence: 0.82024083375

00:41:28.012 --> 00:41:30.014 And then again train their structures a

NOTE Confidence: 0.82024083375

00:41:30.014 --> 00:41:31.877 little bit better within the structure.

NOTE Confidence: 0.82024083375

00:41:31.880 --> 00:41:32.867 And I'm just, I'm just going to

NOTE Confidence: 0.82024083375

00:41:32.867 --> 00:41:33.878 right click on this little guide,

NOTE Confidence: 0.82024083375

00:41:33.880 --> 00:41:36.299 bring it back to normal and then you

NOTE Confidence: 0.82024083375

00:41:36.299 --> 00:41:37.904 have your result that looks like this.

NOTE Confidence: 0.82024083375

00:41:37.904 --> 00:41:40.112 And again as you come in here you you

NOTE Confidence: 0.82024083375

00:41:40.112 --> 00:41:41.714 get the results that you're looking.

NOTE Confidence: 0.82024083375

00:41:41.720 --> 00:41:42.520 Now I don't like,

NOTE Confidence: 0.82024083375

00:41:42.520 --> 00:41:44.440 I don't think that last one made it better.

NOTE Confidence: 0.82024083375

00:41:44.440 --> 00:41:45.280 So I'm going to go back.

NOTE Confidence: 0.82024083375

00:41:45.280 --> 00:41:45.892 I did undo.

NOTE Confidence: 0.82024083375

00:41:45.892 --> 00:41:47.116 There is a delete last here.

NOTE Confidence: 0.82024083375

00:41:47.120 --> 00:41:49.920 There is no delete button or eraser button,

NOTE Confidence: 0.82024083375

00:41:49.920 --> 00:41:50.916 but there is a delete last.

NOTE Confidence: 0.82024083375

00:41:50.920 --> 00:41:52.036 So I like to make small.

NOTE Confidence: 0.82024083375

00:41:52.040 --> 00:41:54.038 Once I make the original training,

NOTE Confidence: 0.82024083375

00:41:54.040 --> 00:41:55.504 I think I make small incremental

NOTE Confidence: 0.82024083375

00:41:55.504 --> 00:41:56.932 changes to kind of create

NOTE Confidence: 0.82024083375

00:41:56.932 --> 00:41:58.120 this particular structure.

NOTE Confidence: 0.82024083375

00:41:58.120 --> 00:42:01.320 But the idea here is you get a nice sharp

NOTE Confidence: 0.946193311428572

00:42:01.405 --> 00:42:03.357 border of your structure,

NOTE Confidence: 0.946193311428572

00:42:03.360 --> 00:42:05.358 much better than any of the

NOTE Confidence: 0.946193311428572

00:42:05.358 --> 00:42:06.357 other methods typically.

NOTE Confidence: 0.946193311428572

00:42:06.360 --> 00:42:09.276 And if your soma is not labeled super well,

NOTE Confidence: 0.946193311428572

00:42:09.280 --> 00:42:11.476 a lot of times cell bodies,

NOTE Confidence: 0.946193311428572

00:42:11.480 --> 00:42:12.836 their somas aren't labeled very well.

NOTE Confidence: 0.946193311428572

00:42:12.840 --> 00:42:14.610 Maybe there's a big hole with

NOTE Confidence: 0.946193311428572

00:42:14.610 --> 00:42:16.799 a nuclei is or what have you.

NOTE Confidence: 0.946193311428572

00:42:16.800 --> 00:42:17.848 With the pixel classification,

NOTE Confidence: 0.946193311428572

00:42:17.848 --> 00:42:19.158 you can train those pixels.

NOTE Confidence: 0.946193311428572

00:42:19.160 --> 00:42:20.994 Even though they're pixels within the nuclei,

NOTE Confidence: 0.946193311428572

00:42:21.000 --> 00:42:21.924 they're not very bright.

NOTE Confidence: 0.946193311428572

00:42:21.924 --> 00:42:23.608 You can train those as real pixels

NOTE Confidence: 0.946193311428572

00:42:23.608 --> 00:42:25.323 and go through and train those pixels

NOTE Confidence: 0.946193311428572

00:42:25.323 --> 00:42:27.144 and you're going to be able to get

NOTE Confidence: 0.946193311428572

00:42:27.144 --> 00:42:28.492 a nice representation of the soma.

NOTE Confidence: 0.946193311428572

00:42:28.492 --> 00:42:30.214 Even if the red labeling of the

NOTE Confidence: 0.946193311428572

00:42:30.214 --> 00:42:31.523 green labeling doesn't really

NOTE Confidence: 0.946193311428572

00:42:31.523 --> 00:42:33.193 label the nuclei very well.

NOTE Confidence: 0.946193311428572

00:42:33.200 --> 00:42:34.360 There's a big hole there.

NOTE Confidence: 0.946193311428572

00:42:34.360 --> 00:42:36.478 It's very common for neurons and

NOTE Confidence: 0.946193311428572

00:42:36.478 --> 00:42:39.056 things like that that have a very

NOTE Confidence: 0.946193311428572

00:42:39.056 --> 00:42:41.240 prominent nuclei that has very little,

NOTE Confidence: 0.946193311428572

00:42:41.240 --> 00:42:42.012 you know,

NOTE Confidence: 0.946193311428572

00:42:42.012 --> 00:42:43.556 protein standing for for

NOTE Confidence: 0.946193311428572

00:42:43.556 --> 00:42:45.440 neurotransmitters or something like that.

NOTE Confidence: 0.946193311428572

00:42:45.440 --> 00:42:46.682 And so that really helps kind

NOTE Confidence: 0.946193311428572

00:42:46.682 --> 00:42:48.164 of give you a full structure

NOTE Confidence: 0.946193311428572

00:42:48.164 --> 00:42:49.674 and volume of that structure.

NOTE Confidence: 0.946193311428572

00:42:49.680 --> 00:42:51.570 So that is the method here in terms of

NOTE Confidence: 0.946193311428572

00:42:51.570 --> 00:42:53.680 the rendering and selecting those pixels,

NOTE Confidence: 0.946193311428572

00:42:53.680 --> 00:42:55.320 whether it's with the intensity

NOTE Confidence: 0.946193311428572

00:42:55.320 --> 00:42:56.960 base or the pixel classification,

NOTE Confidence: 0.946193311428572

00:42:56.960 --> 00:42:58.346 the idea is that you're going

NOTE Confidence: 0.946193311428572

00:42:58.346 --> 00:42:59.614 to get this rendered object

NOTE Confidence: 0.946193311428572

00:42:59.614 --> 00:43:01.079 that's going to look something.

NOTE Confidence: 0.946193311428572

00:43:01.080 --> 00:43:01.716 I'm going to look at that.

NOTE Confidence: 0.946193311428572

00:43:01.720 --> 00:43:02.560 You can see the shaded area,

NOTE Confidence: 0.946193311428572

00:43:02.560 --> 00:43:03.960 it's going to look something

NOTE Confidence: 0.946193311428572

00:43:03.960 --> 00:43:05.360 along the lines of that.

NOTE Confidence: 0.946193311428572

00:43:05.360 --> 00:43:09.024 And so the idea is the next step and this

NOTE Confidence: 0.946193311428572

00:43:09.024 --> 00:43:10.720 is the step that I already processed here.

NOTE Confidence: 0.946193311428572

00:43:10.720 --> 00:43:13.394 There is a split touching object step.

NOTE Confidence: 0.946193311428572

00:43:13.400 --> 00:43:14.990 This is to help us identify

NOTE Confidence: 0.946193311428572

00:43:14.990 --> 00:43:16.440 one surface from the other.

NOTE Confidence: 0.946193311428572

00:43:16.440 --> 00:43:18.240 If those surfaces and those

NOTE Confidence: 0.946193311428572

00:43:18.240 --> 00:43:20.160 edges merge together and we can

NOTE Confidence: 0.946193311428572

00:43:20.160 --> 00:43:21.560 identify them with AC point.

NOTE Confidence: 0.946193311428572

00:43:21.560 --> 00:43:23.240 Now there's two ways to do C points.

NOTE Confidence: 0.946193311428572

00:43:23.240 --> 00:43:24.660 Now in the pixel classifier

NOTE Confidence: 0.946193311428572

00:43:24.660 --> 00:43:26.983 there is only one way and that's

NOTE Confidence: 0.946193311428572

00:43:26.983 --> 00:43:28.237 this morphological split.

NOTE Confidence: 0.946193311428572

00:43:28.240 --> 00:43:30.240 Morphological split is basically looking

NOTE Confidence: 0.946193311428572

00:43:30.240 --> 00:43:32.816 for a geometrical center of a object.

NOTE Confidence: 0.946193311428572

00:43:32.816 --> 00:43:34.640 Now in this case,

NOTE Confidence: 0.946193311428572

00:43:34.640 --> 00:43:36.260 we want to split it based on the cell

NOTE Confidence: 0.946193311428572

00:43:36.260 --> 00:43:37.754 bodies that are in this field of view.

NOTE Confidence: 0.946193311428572

00:43:37.760 --> 00:43:39.488 So the cell bodies are often

NOTE Confidence: 0.946193311428572

00:43:39.488 --> 00:43:40.960 much bigger than anything else.

NOTE Confidence: 0.946193311428572

00:43:40.960 --> 00:43:43.160 So we want this value to be relatively

NOTE Confidence: 0.946193311428572

00:43:43.160 --> 00:43:45.428 large to kind of fit a single C

NOTE Confidence: 0.946193311428572

00:43:45.428 --> 00:43:47.226 point in the geometrical center of

NOTE Confidence: 0.946193311428572

00:43:47.226 --> 00:43:49.116 these big Somas and nothing else.

NOTE Confidence: 0.946193311428572

00:43:49.120 --> 00:43:50.480 We don't want any C points in our

NOTE Confidence: 0.946193311428572

00:43:50.480 --> 00:43:51.560 processes or anything like that.

NOTE Confidence: 0.946193311428572

00:43:51.560 --> 00:43:52.916 So we set it relatively big.

NOTE Confidence: 0.946193311428572

00:43:52.920 --> 00:43:54.928 And so I open up this next step

NOTE Confidence: 0.946193311428572

00:43:54.928 --> 00:43:56.320 and step by step here,

NOTE Confidence: 0.946193311428572

00:43:56.320 --> 00:43:58.600 you can look at your data set here and

NOTE Confidence: 0.946193311428572

00:43:58.600 --> 00:44:00.760 you can adjust your threshold to try to say,

NOTE Confidence: 0.946193311428572

00:44:00.760 --> 00:44:01.142 OK,

NOTE Confidence: 0.946193311428572

00:44:01.142 --> 00:44:03.434 get one seed point for Soma.

NOTE Confidence: 0.946193311428572

00:44:03.440 --> 00:44:05.592 And it does a pretty good job in

NOTE Confidence: 0.946193311428572

00:44:05.592 --> 00:44:07.133 this particular instance to find

NOTE Confidence: 0.946193311428572

00:44:07.133 --> 00:44:09.017 because now we've made that Soma

NOTE Confidence: 0.946193311428572

00:44:09.017 --> 00:44:10.624 object with the machine learning

NOTE Confidence: 0.946193311428572

00:44:10.624 --> 00:44:12.472 that has a nice solid object,

NOTE Confidence: 0.946193311428572

00:44:12.480 --> 00:44:13.824 fully full volumetric object.

NOTE Confidence: 0.946193311428572

00:44:13.824 --> 00:44:15.840 We have a seed point there,

NOTE Confidence: 0.946193311428572

00:44:15.840 --> 00:44:17.240 C point there, C point, C point,

NOTE Confidence: 0.946193311428572

00:44:17.240 --> 00:44:18.320 those are all my cell bodies.

NOTE Confidence: 0.946193311428572

00:44:18.320 --> 00:44:19.360 Does a pretty good job.

NOTE Confidence: 0.946193311428572

00:44:19.360 --> 00:44:21.000 There might be a seed point right here.

NOTE Confidence: 0.946193311428572

00:44:21.000 --> 00:44:22.420 And I think if I lower this down a little

NOTE Confidence: 0.910787074545455

00:44:22.461 --> 00:44:23.680 bit, it'll pick that guy up.

NOTE Confidence: 0.910787074545455

00:44:23.680 --> 00:44:25.605 I put that guy right there, right.

NOTE Confidence: 0.910787074545455

00:44:25.605 --> 00:44:26.595 We try to pick up policy.

NOTE Confidence: 0.910787074545455

00:44:26.600 --> 00:44:27.920 Now, it's not always going to

NOTE Confidence: 0.910787074545455

00:44:27.920 --> 00:44:28.987 get every single one right,

NOTE Confidence: 0.910787074545455

00:44:28.987 --> 00:44:30.109 and there's a lot of other

NOTE Confidence: 0.910787074545455

00:44:30.109 --> 00:44:31.124 processes here that are not

NOTE Confidence: 0.910787074545455

00:44:31.124 --> 00:44:32.159 really attached to the structure.

NOTE Confidence: 0.910787074545455

00:44:32.160 --> 00:44:34.000 But what this process does,

NOTE Confidence: 0.910787074545455

00:44:34.000 --> 00:44:35.836 what the C point thresholding does,

NOTE Confidence: 0.910787074545455

00:44:35.840 --> 00:44:37.534 is it helps us split these objects

NOTE Confidence: 0.910787074545455

00:44:37.534 --> 00:44:39.319 that might be touching each other.

NOTE Confidence: 0.910787074545455

00:44:39.320 --> 00:44:40.514 So you get something that looks

NOTE Confidence: 0.910787074545455

00:44:40.514 --> 00:44:41.790 like this and you can see all

NOTE Confidence: 0.910787074545455

00:44:41.790 --> 00:44:43.119 of a sudden now we get a surface

NOTE Confidence: 0.910787074545455

00:44:43.119 --> 00:44:44.439 rendering that looks like that.

NOTE Confidence: 0.910787074545455

00:44:44.440 --> 00:44:45.904 We got a pretty good representation

NOTE Confidence: 0.910787074545455

00:44:45.904 --> 00:44:46.636 of these Somers.

NOTE Confidence: 0.910787074545455

00:44:46.640 --> 00:44:47.488 You have the processes,

NOTE Confidence: 0.910787074545455

00:44:47.488 --> 00:44:48.760 you have a lot of different

NOTE Confidence: 0.910787074545455

00:44:48.808 --> 00:44:49.835 structures in here. Again,

NOTE Confidence: 0.910787074545455

00:44:49.835 --> 00:44:51.715 I'm going to just finish this process here.

NOTE Confidence: 0.910787074545455

00:44:51.720 --> 00:44:53.016 And all those little

NOTE Confidence: 0.910787074545455

00:44:53.016 --> 00:44:54.636 processes that were in here,

NOTE Confidence: 0.910787074545455

00:44:54.640 --> 00:44:56.120 they were just disconnected processes,

NOTE Confidence: 0.910787074545455

00:44:56.120 --> 00:44:57.660 probably part of another Microglia

NOTE Confidence: 0.910787074545455

00:44:57.660 --> 00:44:59.693 that wasn't in this section, right.

NOTE Confidence: 0.910787074545455

00:44:59.693 --> 00:45:02.158 It's not connected, it's not,

NOTE Confidence: 0.910787074545455

00:45:02.160 --> 00:45:03.320 it's not continuous with the

NOTE Confidence: 0.910787074545455

00:45:03.320 --> 00:45:04.480 structures that we have here.

NOTE Confidence: 0.910787074545455

00:45:04.480 --> 00:45:05.090 Now again,

NOTE Confidence: 0.910787074545455

00:45:05.090 --> 00:45:07.125 this is a really good example and

NOTE Confidence: 0.910787074545455

00:45:07.125 --> 00:45:08.355 the reason this works well with

NOTE Confidence: 0.910787074545455

00:45:08.355 --> 00:45:09.582 Microglia is that they're often

NOTE Confidence: 0.910787074545455

00:45:09.582 --> 00:45:10.718 nice and continuous structure.

NOTE Confidence: 0.910787074545455

00:45:10.720 --> 00:45:12.997 So if I view this here with object ID,

NOTE Confidence: 0.910787074545455

00:45:13.000 --> 00:45:14.568 you can kind of get a better

NOTE Confidence: 0.910787074545455

00:45:14.568 --> 00:45:16.200 idea of the structures here.

NOTE Confidence: 0.910787074545455

00:45:16.200 --> 00:45:17.208 That's a microglia,

NOTE Confidence: 0.910787074545455

00:45:17.208 --> 00:45:18.236 single microglia, microglia,

NOTE Confidence: 0.910787074545455

00:45:18.236 --> 00:45:18.948 single microglia.

NOTE Confidence: 0.910787074545455

00:45:18.948 --> 00:45:21.440 You have these structures now with these

NOTE Confidence: 0.910787074545455

00:45:21.498 --> 00:45:23.418 individual structures that we have that

NOTE Confidence: 0.910787074545455

00:45:23.418 --> 00:45:25.839 were created using the pixel classification,

NOTE Confidence: 0.910787074545455

00:45:25.840 --> 00:45:28.094 using the splitting to try to identify

NOTE Confidence: 0.910787074545455

00:45:28.094 --> 00:45:29.799 these microglia as best we can.

NOTE Confidence: 0.910787074545455

00:45:29.800 --> 00:45:30.480 And again,

NOTE Confidence: 0.910787074545455

00:45:30.480 --> 00:45:32.520 if it's continuous with this structure,

NOTE Confidence: 0.910787074545455

00:45:32.520 --> 00:45:34.039 it's going to be a single microglia.

NOTE Confidence: 0.910787074545455

00:45:34.040 --> 00:45:35.960 Now this one might go a little bit too far.

NOTE Confidence: 0.910787074545455

00:45:35.960 --> 00:45:37.320 I don't know if it's connected a little

NOTE Confidence: 0.910787074545455

00:45:37.320 --> 00:45:38.398 bit further than the word should,

NOTE Confidence: 0.910787074545455

00:45:38.400 --> 00:45:39.438 is a little bigger than everything,

NOTE Confidence: 0.910787074545455

00:45:39.440 --> 00:45:40.640 but maybe that's a real microglia.

NOTE Confidence: 0.910787074545455

00:45:40.640 --> 00:45:42.428 Again, if it's continued with the

NOTE Confidence: 0.910787074545455

00:45:42.428 --> 00:45:44.160 structure that's what we're rendering.

NOTE Confidence: 0.910787074545455

00:45:44.160 --> 00:45:45.742 And so if it's not continuous then

NOTE Confidence: 0.910787074545455

00:45:45.742 --> 00:45:47.398 we're we're it's not going to kind of,

NOTE Confidence: 0.910787074545455

00:45:47.400 --> 00:45:48.513 it's not going to split it and

NOTE Confidence: 0.910787074545455

00:45:48.513 --> 00:45:49.320 it's going to keep it,

NOTE Confidence: 0.910787074545455

00:45:49.320 --> 00:45:50.313 keep it separate.

NOTE Confidence: 0.910787074545455

00:45:50.313 --> 00:45:52.299 So that is kind of surface

NOTE Confidence: 0.910787074545455

00:45:52.299 --> 00:45:53.558 rendering in a nutshell,

NOTE Confidence: 0.910787074545455

00:45:53.560 --> 00:45:55.345 all the different ways we had to

NOTE Confidence: 0.910787074545455

00:45:55.345 --> 00:45:56.839 make surfaces within the structure.

NOTE Confidence: 0.899490284285714

00:45:59.120 --> 00:46:00.712 The next step is to kind of look

NOTE Confidence: 0.899490284285714

00:46:00.712 --> 00:46:02.398 at say look at some statistics.

NOTE Confidence: 0.899490284285714

00:46:02.400 --> 00:46:04.011 So if we were to take this data set

NOTE Confidence: 0.899490284285714

00:46:04.011 --> 00:46:05.798 and for example the microglia and say,

NOTE Confidence: 0.899490284285714

00:46:05.800 --> 00:46:06.790 hey, what kind of statistics

NOTE Confidence: 0.899490284285714

00:46:06.790 --> 00:46:08.240 do we have from the structure,

NOTE Confidence: 0.899490284285714

00:46:08.240 --> 00:46:10.120 we have the idea to kind of come

NOTE Confidence: 0.899490284285714

00:46:10.120 --> 00:46:12.237 in here and look at the statistics.

NOTE Confidence: 0.899490284285714

00:46:12.240 --> 00:46:13.680 So if you click on the statistics tab,

NOTE Confidence: 0.899490284285714

00:46:13.680 --> 00:46:14.960 here you go to detail,

NOTE Confidence: 0.899490284285714

00:46:14.960 --> 00:46:16.436 all these values are listed here.

NOTE Confidence: 0.899490284285714

00:46:16.440 --> 00:46:17.622 For your statistics,

NOTE Confidence: 0.899490284285714

00:46:17.622 --> 00:46:21.198 we have surface area, we have volume,

NOTE Confidence: 0.899490284285714

00:46:21.198 --> 00:46:23.196 we have intensity.

NOTE Confidence: 0.899490284285714

00:46:23.200 --> 00:46:25.640 All these values are here that we

NOTE Confidence: 0.899490284285714

00:46:25.640 --> 00:46:26.900 can measure for each one of those

NOTE Confidence: 0.899490284285714

00:46:26.900 --> 00:46:28.160 and they're all selected here.

NOTE Confidence: 0.899490284285714

00:46:28.160 --> 00:46:30.056 And if you click on the gear tab

NOTE Confidence: 0.899490284285714

00:46:30.056 --> 00:46:31.961 here or the the disk here will

NOTE Confidence: 0.899490284285714

00:46:31.961 --> 00:46:34.160 export what you have on display here.

NOTE Confidence: 0.899490284285714

00:46:34.160 --> 00:46:36.288 Or if you click this guy here that'll

NOTE Confidence: 0.899490284285714

00:46:36.288 --> 00:46:37.798 export everything as a CSV file and

NOTE Confidence: 0.899490284285714

00:46:37.798 --> 00:46:39.569 you can open that up in excel and

NOTE Confidence: 0.899490284285714

00:46:39.569 --> 00:46:41.165 export all the statistics together and

NOTE Confidence: 0.899490284285714

00:46:41.165 --> 00:46:42.903 and kind of deal with all the stats

NOTE Confidence: 0.899490284285714

00:46:42.903 --> 00:46:44.878 that you want to get within the structure.

NOTE Confidence: 0.899490284285714

00:46:44.880 --> 00:46:47.337 Now one statistic that I like a lot and

NOTE Confidence: 0.899490284285714

00:46:47.337 --> 00:46:49.880 I use a lot for data sets like this

NOTE Confidence: 0.899490284285714

00:46:49.880 --> 00:46:52.638 is I use bounding box feature here

NOTE Confidence: 0.899490284285714

00:46:52.640 --> 00:46:54.200 which gives you the size of the structure.

NOTE Confidence: 0.899490284285714

00:46:54.200 --> 00:46:56.414 So it every surface in a

NOTE Confidence: 0.899490284285714

00:46:56.414 --> 00:46:58.439 Morris is contained by a box,

NOTE Confidence: 0.899490284285714

00:46:58.440 --> 00:46:59.307 a 3D box.

NOTE Confidence: 0.899490284285714

00:46:59.307 --> 00:47:01.330 This bounding box I finds the longest

NOTE Confidence: 0.899490284285714

00:47:01.394 --> 00:47:04.040 principal access of the of the of the cell.

NOTE Confidence: 0.899490284285714

00:47:04.040 --> 00:47:04.871 So for example,

NOTE Confidence: 0.899490284285714

00:47:04.871 --> 00:47:06.810 this blue guy that's in here probably

NOTE Confidence: 0.899490284285714

00:47:06.869 --> 00:47:08.811 has a really long bounding box 108,

NOTE Confidence: 0.899490284285714

00:47:08.811 --> 00:47:11.318 which is measuring the edge of that

NOTE Confidence: 0.899490284285714

00:47:11.318 --> 00:47:12.152 surface from there,

NOTE Confidence: 0.899490284285714

00:47:12.152 --> 00:47:14.113 probably the edge of that surface there

NOTE Confidence: 0.899490284285714

00:47:14.113 --> 00:47:15.577 along the the longest principal axis

NOTE Confidence: 0.899490284285714

00:47:15.577 --> 00:47:17.557 of a box that fits that structure.

NOTE Confidence: 0.899490284285714

00:47:17.560 --> 00:47:18.736 And then some of these smaller

NOTE Confidence: 0.899490284285714

00:47:18.736 --> 00:47:19.920 guys that are that are here,

NOTE Confidence: 0.899490284285714

00:47:19.920 --> 00:47:21.360 they're going to be like 63,

NOTE Confidence: 0.899490284285714

00:47:21.360 --> 00:47:22.596 it's going to be much smaller.

NOTE Confidence: 0.899490284285714

00:47:22.600 --> 00:47:23.836 Now that's not a complete structure,

NOTE Confidence: 0.899490284285714

00:47:23.840 --> 00:47:25.118 but it's edge of the structure.

NOTE Confidence: 0.899490284285714

00:47:25.120 --> 00:47:26.495 The edge of the structure

NOTE Confidence: 0.899490284285714

00:47:26.495 --> 00:47:27.595 gets that bounding box,

NOTE Confidence: 0.899490284285714

00:47:27.600 --> 00:47:29.064 gives you a little bit of

NOTE Confidence: 0.899490284285714

00:47:29.064 --> 00:47:30.040 morphological measures out there.

NOTE Confidence: 0.899490284285714

00:47:30.040 --> 00:47:31.748 But any of these statistics you can

NOTE Confidence: 0.899490284285714

00:47:31.748 --> 00:47:33.557 export and get out of the structure.

NOTE Confidence: 0.899490284285714

00:47:33.560 --> 00:47:35.864 Now I'm going to go through here really

NOTE Confidence: 0.899490284285714

00:47:35.864 --> 00:47:37.809 quickly just to give you a concept

NOTE Confidence: 0.899490284285714

00:47:37.809 --> 00:47:39.559 of some analysis that you can do.

NOTE Confidence: 0.899490284285714

00:47:39.560 --> 00:47:40.715 I'm not going to make the surface,

NOTE Confidence: 0.899490284285714

00:47:40.720 --> 00:47:41.826 I'm not just going to walk through

NOTE Confidence: 0.899490284285714

00:47:41.826 --> 00:47:42.838 it because I've already done it.

NOTE Confidence: 0.899490284285714

00:47:42.840 --> 00:47:44.478 You can do it with the traditional

NOTE Confidence: 0.899490284285714

00:47:44.478 --> 00:47:46.244 means here or you can do the

NOTE Confidence: 0.899490284285714

00:47:46.244 --> 00:47:47.509 pixel classification means I did

NOTE Confidence: 0.899490284285714

00:47:47.509 --> 00:47:49.040 both Results are very similar,

NOTE Confidence: 0.899490284285714

00:47:49.040 --> 00:47:50.685 but the idea is you don't always

NOTE Confidence: 0.899490284285714

00:47:50.685 --> 00:47:52.200 need the pixel classification,

NOTE Confidence: 0.899490284285714

00:47:52.200 --> 00:47:53.754 just depends on what you're looking for,

NOTE Confidence: 0.899490284285714

00:47:53.760 --> 00:47:55.320 on how you're trying to render your objects.

NOTE Confidence: 0.899490284285714

00:47:55.320 --> 00:47:58.596 Sometimes for puncta the the the

NOTE Confidence: 0.899490284285714

00:47:58.600 --> 00:48:00.256 the regular creation parameters

NOTE Confidence: 0.899490284285714

00:48:00.256 --> 00:48:02.326 within the surface works works

NOTE Confidence: 0.899490284285714

00:48:02.326 --> 00:48:04.000 really well and you can see we've

NOTE Confidence: 0.899490284285714

00:48:04.000 --> 00:48:04.960 made all these little punks.

NOTE Confidence: 0.899490284285714

00:48:04.960 --> 00:48:06.958 And again, if we go into the Slicer mode,

NOTE Confidence: 0.899490284285714

00:48:06.960 --> 00:48:08.139 turn this off,

NOTE Confidence: 0.899490284285714

00:48:08.139 --> 00:48:09.318 make this white,

NOTE Confidence: 0.855641021111111

00:48:13.920 --> 00:48:15.560 right, you can see these

NOTE Confidence: 0.855641021111111

00:48:15.560 --> 00:48:16.872 surfaces are getting rendered.

NOTE Confidence: 0.855641021111111

00:48:16.880 --> 00:48:19.196 Any surfaces again that are touching,

NOTE Confidence: 0.855641021111111

00:48:19.200 --> 00:48:19.884 that's a punk.

NOTE Confidence: 0.855641021111111

00:48:19.884 --> 00:48:21.040 And that's a puncta, right?

NOTE Confidence: 0.855641021111111

00:48:21.040 --> 00:48:22.720 AC point there and AC point there,

NOTE Confidence: 0.855641021111111

00:48:22.720 --> 00:48:23.600 they're going to get split.

NOTE Confidence: 0.855641021111111

00:48:23.600 --> 00:48:24.320 So you have a surface there

NOTE Confidence: 0.855641021111111

00:48:24.320 --> 00:48:25.239 and you have a surface there,

NOTE Confidence: 0.855641021111111

00:48:25.240 --> 00:48:26.968 two separate surfaces based on the

NOTE Confidence: 0.855641021111111

00:48:26.968 --> 00:48:28.832 C point splitting in that watershed

NOTE Confidence: 0.855641021111111

00:48:28.832 --> 00:48:30.737 that we talked about earlier, right.

NOTE Confidence: 0.855641021111111

00:48:30.737 --> 00:48:32.471 So then we have the numbers, right?

NOTE Confidence: 0.855641021111111

00:48:32.471 --> 00:48:33.999 You can come up here and you can

NOTE Confidence: 0.855641021111111

00:48:33.999 --> 00:48:35.438 say how many Puncta do we have?

NOTE Confidence: 0.855641021111111

00:48:35.440 --> 00:48:36.760 How many punk did we create?

NOTE Confidence: 0.855641021111111

00:48:36.760 --> 00:48:38.440 Click on here go to Overall,

NOTE Confidence: 0.855641021111111

00:48:38.440 --> 00:48:41.955 we have 3861 total punked up in

NOTE Confidence: 0.855641021111111

00:48:41.955 --> 00:48:43.584 this entire volume, top to bottom.

NOTE Confidence: 0.855641021111111

00:48:43.584 --> 00:48:44.000 And again,

NOTE Confidence: 0.855641021111111

00:48:44.000 --> 00:48:45.512 if we turn this off and look at it,

NOTE Confidence: 0.855641021111111

00:48:45.520 --> 00:48:46.480 that's what it looks like.

NOTE Confidence: 0.855641021111111

00:48:46.480 --> 00:48:48.344 Little tiny little surfaces

NOTE Confidence: 0.855641021111111

00:48:48.344 --> 00:48:50.674 pockmark throughout the data set.

NOTE Confidence: 0.855641021111111

00:48:50.680 --> 00:48:52.552 Now, one of the big things

NOTE Confidence: 0.855641021111111

00:48:52.552 --> 00:48:54.640 that a Mars is known for,

NOTE Confidence: 0.855641021111111

00:48:54.640 --> 00:48:55.998 and what most people use with a

NOTE Confidence: 0.855641021111111

00:48:55.998 --> 00:48:58.057 Mars is they want to look at the

NOTE Confidence: 0.855641021111111

00:48:58.057 --> 00:48:59.197 interaction between multiple surfaces,

NOTE Confidence: 0.855641021111111

00:48:59.200 --> 00:49:00.656 whether they're surfaces or

NOTE Confidence: 0.855641021111111

00:49:00.656 --> 00:49:02.476 spots or surfaces and surfaces.

NOTE Confidence: 0.855641021111111

00:49:02.480 --> 00:49:05.156 We do those sorts of things.

NOTE Confidence: 0.855641021111111

00:49:05.160 --> 00:49:06.760 So just to kind of before I get into that,

NOTE Confidence: 0.855641021111111

00:49:06.760 --> 00:49:07.838 I'm sorry, before you get into that,

NOTE Confidence: 0.855641021111111

00:49:07.840 --> 00:49:09.720 you can do the spot detection as well.

NOTE Confidence: 0.855641021111111

00:49:09.720 --> 00:49:10.816 I'm not going to spend a whole lot

NOTE Confidence: 0.855641021111111

00:49:10.816 --> 00:49:11.838 of time on the spot detection,

NOTE Confidence: 0.855641021111111

00:49:11.840 --> 00:49:13.316 but I just want to kind of show you,

NOTE Confidence: 0.855641021111111

00:49:13.320 --> 00:49:15.399 show you what that does here real quick here.

NOTE Confidence: 0.855641021111111

00:49:15.400 --> 00:49:17.059 So a lot of times people just

NOTE Confidence: 0.855641021111111

00:49:17.059 --> 00:49:18.160 want to count spots.

NOTE Confidence: 0.855641021111111

00:49:18.160 --> 00:49:18.684 They don't,

NOTE Confidence: 0.855641021111111

00:49:18.684 --> 00:49:20.518 they don't really care about the morphology,

NOTE Confidence: 0.855641021111111

00:49:20.520 --> 00:49:21.720 they don't care about the size.

NOTE Confidence: 0.855641021111111

00:49:21.720 --> 00:49:23.120 They just want to know how many

NOTE Confidence: 0.855641021111111

00:49:23.120 --> 00:49:24.857 punked are in my field of view, right.

NOTE Confidence: 0.855641021111111

00:49:24.857 --> 00:49:26.542 That's where the spot feature

NOTE Confidence: 0.855641021111111

00:49:26.542 --> 00:49:27.553 comes into play.

NOTE Confidence: 0.855641021111111

00:49:27.560 --> 00:49:27.928 And again,

NOTE Confidence: 0.855641021111111

00:49:27.928 --> 00:49:30.159 if I come in here and I look at those spots,

NOTE Confidence: 0.855641021111111

00:49:30.160 --> 00:49:33.720 let me turn this off.

NOTE Confidence: 0.855641021111111

00:49:33.720 --> 00:49:34.895 You have these little spots

NOTE Confidence: 0.855641021111111

00:49:34.895 --> 00:49:35.835 within the data set.

NOTE Confidence: 0.855641021111111

00:49:35.840 --> 00:49:36.045 Again,

NOTE Confidence: 0.855641021111111

00:49:36.045 --> 00:49:37.685 you can view this in a slicer mode

NOTE Confidence: 0.855641021111111

00:49:37.685 --> 00:49:39.462 and you'll see a little circle and you

NOTE Confidence: 0.855641021111111

00:49:39.462 --> 00:49:41.030 can see those spots identifying all

NOTE Confidence: 0.855641021111111

00:49:41.030 --> 00:49:43.039 the different puncta within the data set.

NOTE Confidence: 0.855641021111111

00:49:43.040 --> 00:49:43.352 And again,

NOTE Confidence: 0.855641021111111

00:49:43.352 --> 00:49:44.600 if I come up here and rebuild it,

NOTE Confidence: 0.855641021111111

00:49:44.600 --> 00:49:46.196 this is a really simple feature.

NOTE Confidence: 0.769969612222222

00:49:48.240 --> 00:49:50.400 You come in here, you choose a spot size,

NOTE Confidence: 0.769969612222222

00:49:50.400 --> 00:49:52.714 single spot size, 1 Micron, 2 microns,

NOTE Confidence: 0.769969612222222

00:49:52.714 --> 00:49:54.513 whatever the size you're trying to do,

NOTE Confidence: 0.769969612222222

00:49:54.520 --> 00:49:55.540 and identify these functa.

NOTE Confidence: 0.769969612222222

00:49:55.540 --> 00:49:56.815 Typically you do a little

NOTE Confidence: 0.769969612222222

00:49:56.815 --> 00:49:57.920 background subtraction as well.

NOTE Confidence: 0.769969612222222

00:49:57.920 --> 00:49:58.424 You don't have to.

NOTE Confidence: 0.769969612222222

00:49:58.424 --> 00:49:59.799 If you want to just do it on the raw data,

NOTE Confidence: 0.769969612222222

00:49:59.800 --> 00:50:00.520 you can do that as well.

NOTE Confidence: 0.769969612222222

00:50:00.520 --> 00:50:01.285 But background subtraction,

NOTE Confidence: 0.769969612222222

00:50:01.285 --> 00:50:03.693 again on a data set like this that has a

NOTE Confidence: 0.769969612222222

00:50:03.693 --> 00:50:05.400 fair bit of signal noise in your tissue,

NOTE Confidence: 0.769969612222222

00:50:05.400 --> 00:50:07.440 it's probably a good idea in most cases.

NOTE Confidence: 0.769969612222222

00:50:07.440 --> 00:50:09.197 I almost always have that turned on.

NOTE Confidence: 0.769969612222222

00:50:09.200 --> 00:50:10.166 You come in here and you're

NOTE Confidence: 0.769969612222222

00:50:10.166 --> 00:50:11.240 going to get a threshold.

NOTE Confidence: 0.769969612222222

00:50:11.240 --> 00:50:13.280 You adjust the threshold to

NOTE Confidence: 0.769969612222222

00:50:13.280 --> 00:50:15.800 make sure your spots are real.

NOTE Confidence: 0.769969612222222

00:50:15.800 --> 00:50:16.872 Identify a particular threshold,

NOTE Confidence: 0.769969612222222

00:50:16.872 --> 00:50:19.369 you hit finish and then you can get all your

NOTE Confidence: 0.769969612222222

00:50:19.369 --> 00:50:21.079 spots that are created in that data set.

NOTE Confidence: 0.769969612222222

00:50:21.080 --> 00:50:22.720 You can see all your spots in that data set.

NOTE Confidence: 0.769969612222222

00:50:22.720 --> 00:50:23.679 And again, if you come in here,

NOTE Confidence: 0.769969612222222

00:50:23.680 --> 00:50:24.256 your statistics,

NOTE Confidence: 0.769969612222222

00:50:24.256 --> 00:50:25.984 you have the total number of

NOTE Confidence: 0.769969612222222

00:50:25.984 --> 00:50:27.360 spots within your structure.

NOTE Confidence: 0.769969612222222

00:50:27.360 --> 00:50:29.064 Really quite easy to get those

NOTE Confidence: 0.769969612222222

00:50:29.064 --> 00:50:30.200 numbers within the structure.

NOTE Confidence: 0.769969612222222

00:50:30.200 --> 00:50:32.927 But the big thing is how do we do

NOTE Confidence: 0.769969612222222

00:50:32.927 --> 00:50:35.967 the analysis of this CD 86 surface

NOTE Confidence: 0.769969612222222

00:50:35.967 --> 00:50:38.560 here and this Microglia one here?

NOTE Confidence: 0.769969612222222

00:50:38.560 --> 00:50:39.152 I'm going to do,

NOTE Confidence: 0.769969612222222

00:50:39.152 --> 00:50:40.400 I'm just going to do this one here.

NOTE Confidence: 0.769969612222222

00:50:40.400 --> 00:50:42.808 That's really right.

NOTE Confidence: 0.769969612222222

00:50:42.808 --> 00:50:44.792 So we have these microglia that we rendered,

NOTE Confidence: 0.769969612222222

00:50:44.800 --> 00:50:44.992 right.

NOTE Confidence: 0.769969612222222

00:50:44.992 --> 00:50:47.200 So those are our, our microglia surfaces.

NOTE Confidence: 0.769969612222222

00:50:47.200 --> 00:50:50.520 We want to maybe measure the the

NOTE Confidence: 0.769969612222222

00:50:50.520 --> 00:50:52.280 relationship between the two.

NOTE Confidence: 0.769969612222222

00:50:52.280 --> 00:50:54.200 So the biggest thing that we like to

NOTE Confidence: 0.769969612222222

00:50:54.200 --> 00:50:56.896 do is we're going to come in here and

NOTE Confidence: 0.769969612222222

00:50:56.896 --> 00:50:59.920 turn on this object, object statistics.

NOTE Confidence: 0.769969612222222

00:50:59.920 --> 00:51:01.320 So under the edit tab.

NOTE Confidence: 0.769969612222222

00:51:01.320 --> 00:51:02.280 Now I didn't turn it on for all

NOTE Confidence: 0.769969612222222

00:51:02.280 --> 00:51:03.239 of them because I don't want to

NOTE Confidence: 0.769969612222222

00:51:03.239 --> 00:51:04.200 turn the law for all of them.

NOTE Confidence: 0.769969612222222

00:51:04.200 --> 00:51:05.397 I only only have these turned on.

NOTE Confidence: 0.769969612222222

00:51:05.400 --> 00:51:06.646 I only have it turned on for

NOTE Confidence: 0.769969612222222

00:51:06.646 --> 00:51:07.776 these two guys right now, right.

NOTE Confidence: 0.769969612222222

00:51:07.776 --> 00:51:09.000 So I have you don't want to turn on

NOTE Confidence: 0.769969612222222

00:51:09.032 --> 00:51:10.310 for everything because then it's going

NOTE Confidence: 0.769969612222222

00:51:10.310 --> 00:51:11.718 to calculate everything and that can really,

NOTE Confidence: 0.769969612222222

00:51:11.720 --> 00:51:12.656 depending on the size of your

NOTE Confidence: 0.769969612222222

00:51:12.656 --> 00:51:13.656 data set that can really bog

NOTE Confidence: 0.769969612222222

00:51:13.656 --> 00:51:14.676 down your system a little bit.

NOTE Confidence: 0.769969612222222

00:51:14.680 --> 00:51:16.372 So we try to only turn it on when

NOTE Confidence: 0.769969612222222

00:51:16.372 --> 00:51:18.083 we're ready to kind of calculate

NOTE Confidence: 0.769969612222222

00:51:18.083 --> 00:51:19.553 and export a particular statistic.

NOTE Confidence: 0.769969612222222

00:51:19.560 --> 00:51:21.112 And So what I want to know is

NOTE Confidence: 0.769969612222222

00:51:21.112 --> 00:51:22.679 what the customer want to know.

NOTE Confidence: 0.769969612222222

00:51:22.680 --> 00:51:23.880 This is a real customer data

NOTE Confidence: 0.769969612222222

00:51:23.880 --> 00:51:25.199 set from a few years ago.

NOTE Confidence: 0.769969612222222

00:51:25.200 --> 00:51:27.824 They wanted to know how much of the

NOTE Confidence: 0.769969612222222

00:51:27.824 --> 00:51:30.720 CD 80 AC-6 protein is overlapping

NOTE Confidence: 0.769969612222222

00:51:30.720 --> 00:51:32.480 with the microglia surface that

NOTE Confidence: 0.769969612222222

00:51:32.480 --> 00:51:34.240 we've rendered in its entirety,

NOTE Confidence: 0.769969612222222

00:51:34.240 --> 00:51:35.840 hopefully right with these

NOTE Confidence: 0.769969612222222

00:51:35.840 --> 00:51:36.860 surface renderings, right.

NOTE Confidence: 0.769969612222222

00:51:36.860 --> 00:51:38.180 So we made the surface renderings

NOTE Confidence: 0.769969612222222

00:51:38.180 --> 00:51:38.840 of the microglia,

NOTE Confidence: 0.769969612222222

00:51:38.840 --> 00:51:41.200 we made the surface renderings of the ACD

NOTE Confidence: 0.769969612222222

00:51:41.200 --> 00:51:43.400 86 making these volumetric measurements,

NOTE Confidence: 0.769969612222222

00:51:43.400 --> 00:51:44.744 and they wanted to know how much

NOTE Confidence: 0.769969612222222

00:51:44.744 --> 00:51:46.455 of the CD 86 is overlapping, right?

NOTE Confidence: 0.769969612222222

00:51:46.455 --> 00:51:48.495 And so by turning on this object to

NOTE Confidence: 0.769969612222222

00:51:48.495 --> 00:51:50.157 object statistic makes it really,

NOTE Confidence: 0.769969612222222

00:51:50.160 --> 00:51:52.070 really easy because what happens

NOTE Confidence: 0.769969612222222

00:51:52.070 --> 00:51:55.023 now if I click on IBA one and

NOTE Confidence: 0.769969612222222

00:51:55.023 --> 00:51:56.955 I go to my statistics tab,

NOTE Confidence: 0.769969612222222

00:51:56.960 --> 00:51:58.800 put a detail here,

NOTE Confidence: 0.769969612222222

00:51:58.800 --> 00:52:00.198 I'm going to Scroll down here,

NOTE Confidence: 0.939424653

00:52:00.200 --> 00:52:02.916 there's a value here that says overlap

NOTE Confidence: 0.939424653

00:52:02.916 --> 00:52:04.800 volume ratio with CD86, right?

NOTE Confidence: 0.939424653

00:52:04.800 --> 00:52:08.291 So CD 86 is the the name of the the

NOTE Confidence: 0.939424653

00:52:08.291 --> 00:52:09.797 the surface structure we created here.

NOTE Confidence: 0.939424653

00:52:09.800 --> 00:52:11.288 So I'm going to click this

NOTE Confidence: 0.939424653

00:52:11.288 --> 00:52:12.032 Overlap volume ratio.

NOTE Confidence: 0.939424653

00:52:12.040 --> 00:52:14.560 Overlap volume ratio is basically a

NOTE Confidence: 0.939424653

00:52:14.560 --> 00:52:17.158 percentage of how much the green surface

NOTE Confidence: 0.939424653

00:52:17.158 --> 00:52:19.293 is overlapping with the red surface, right?

NOTE Confidence: 0.939424653

00:52:19.293 --> 00:52:20.758 And so every red surface.

NOTE Confidence: 0.939424653

00:52:20.760 --> 00:52:23.035 So this guy has a red surface

NOTE Confidence: 0.939424653

00:52:23.040 --> 00:52:25.520 and that's the number .06.

NOTE Confidence: 0.939424653

00:52:25.520 --> 00:52:27.926 So that surface that re rendered

NOTE Confidence: 0.939424653

00:52:27.926 --> 00:52:31.360 in the red is overlapping 0 point.

NOTE Confidence: 0.939424653

00:52:31.360 --> 00:52:32.408 The ratio is .06.

NOTE Confidence: 0.939424653

00:52:32.408 --> 00:52:34.280 But if you multiply that by 100,

NOTE Confidence: 0.939424653

00:52:34.280 --> 00:52:36.240 it's basically 6% is what it's saying.

NOTE Confidence: 0.939424653

00:52:36.240 --> 00:52:39.080 So 6% of the volume,

NOTE Confidence: 0.939424653

00:52:39.080 --> 00:52:41.946 total volume of that microglia is

NOTE Confidence: 0.939424653

00:52:41.946 --> 00:52:44.688 overlapping with green pumped up, right.

NOTE Confidence: 0.939424653

00:52:44.688 --> 00:52:45.912 So about 6%.

NOTE Confidence: 0.939424653

00:52:45.912 --> 00:52:49.640 This guy here is 8%, this guy here 5%,

NOTE Confidence: 0.939424653

00:52:49.640 --> 00:52:51.320 this guy here 7%.

NOTE Confidence: 0.939424653

00:52:51.320 --> 00:52:53.248 So you can get a range of distribution

NOTE Confidence: 0.939424653

00:52:53.248 --> 00:52:55.369 to say how much of the microglia

NOTE Confidence: 0.939424653

00:52:55.369 --> 00:52:56.949 is actually overlapping with this

NOTE Confidence: 0.939424653

00:52:57.009 --> 00:52:58.683 activation protein that is supposed to

NOTE Confidence: 0.939424653

00:52:58.683 --> 00:53:01.640 be kind of on the inside of that structure.

NOTE Confidence: 0.939424653

00:53:01.640 --> 00:53:03.332 And you have this way of kind of getting

NOTE Confidence: 0.939424653

00:53:03.332 --> 00:53:05.000 these interactions to meet to each other.

NOTE Confidence: 0.939424653

00:53:05.000 --> 00:53:07.238 You could also look at distances,

NOTE Confidence: 0.939424653

00:53:07.240 --> 00:53:09.640 So this is looking at the overlap ratio.

NOTE Confidence: 0.939424653

00:53:09.640 --> 00:53:11.476 You can also look at distances.

NOTE Confidence: 0.939424653

00:53:11.480 --> 00:53:13.586 So if I wanted to go back to the

NOTE Confidence: 0.939424653

00:53:13.586 --> 00:53:15.556 CD 86 and say you know what,

NOTE Confidence: 0.939424653

00:53:15.560 --> 00:53:17.317 I wanted to find the CD 86,

NOTE Confidence: 0.939424653

00:53:17.320 --> 00:53:19.440 not just just the ones that are overlapping.

NOTE Confidence: 0.939424653

00:53:19.440 --> 00:53:21.608 I want to get the CD 86 that's

NOTE Confidence: 0.939424653

00:53:21.608 --> 00:53:23.957 within X microns of my micro glare

NOTE Confidence: 0.939424653

00:53:23.960 --> 00:53:25.240 or something along those lines.

NOTE Confidence: 0.939424653

00:53:25.240 --> 00:53:28.156 Right. I can come down here.

NOTE Confidence: 0.939424653

00:53:28.160 --> 00:53:29.320 There's a filter tab here.

NOTE Confidence: 0.939424653

00:53:29.320 --> 00:53:30.622 I'm going to click a filter so

NOTE Confidence: 0.939424653

00:53:30.622 --> 00:53:32.188 this is the filter tab here and you

NOTE Confidence: 0.939424653

00:53:32.188 --> 00:53:33.679 can use this at any point here.

NOTE Confidence: 0.939424653

00:53:33.680 --> 00:53:34.832 Scroll down here.

NOTE Confidence: 0.939424653

00:53:34.832 --> 00:53:36.752 That statistic here say shortest

NOTE Confidence: 0.939424653

00:53:36.752 --> 00:53:37.520 distance here,

NOTE Confidence: 0.939424653

00:53:37.520 --> 00:53:39.332 So we're going to do shortest

NOTE Confidence: 0.939424653

00:53:39.332 --> 00:53:40.752 distance to IBA one, right?

NOTE Confidence: 0.939424653

00:53:40.752 --> 00:53:42.920 Which is the surface that we've created,

NOTE Confidence: 0.939424653

00:53:42.920 --> 00:53:43.643 the intensity based.

NOTE Confidence: 0.939424653

00:53:43.643 --> 00:53:45.560 And I can set this threshold and say,

NOTE Confidence: 0.939424653

00:53:45.560 --> 00:53:47.688 hey, you know what I want Any punk

NOTE Confidence: 0.939424653

00:53:47.688 --> 00:53:49.440 that outs within two microns,

NOTE Confidence: 0.939424653

00:53:49.440 --> 00:53:51.152 there we go, right.

NOTE Confidence: 0.939424653

00:53:51.152 --> 00:53:54.346 So out of 300 and six 3861,

NOTE Confidence: 0.939424653

00:53:54.346 --> 00:53:57.880 we have 21110 that are within two microns.

NOTE Confidence: 0.939424653

00:53:57.880 --> 00:53:59.238 And I can duplicate this out and

NOTE Confidence: 0.939424653

00:53:59.238 --> 00:54:00.837 I can get a new structure here.

NOTE Confidence: 0.939424653

00:54:00.840 --> 00:54:02.485 And I usually like to rename this

NOTE Confidence: 0.939424653

00:54:02.485 --> 00:54:03.720 because it's really usually a

NOTE Confidence: 0.939424653

00:54:03.720 --> 00:54:04.440 long rename here.

NOTE Confidence: 0.939424653

00:54:04.440 --> 00:54:06.232 So I'll come up in here and I'll

NOTE Confidence: 0.939424653

00:54:06.232 --> 00:54:10.724 do this C86 within two microns

NOTE Confidence: 0.939424653

00:54:10.724 --> 00:54:14.200 of IBA one whatever or IBA one

NOTE Confidence: 0.64350688

00:54:16.840 --> 00:54:19.315 with an IBA one and you get quantification.

NOTE Confidence: 0.64350688

00:54:19.315 --> 00:54:21.240 Here you can look at the statistics.

NOTE Confidence: 0.912706339

00:54:23.800 --> 00:54:25.600 Again, I like to turn when I do a

NOTE Confidence: 0.912706339

00:54:25.600 --> 00:54:27.198 duplication, I like to turn this off.

NOTE Confidence: 0.912706339

00:54:27.200 --> 00:54:28.757 But again, if you go to your statistics here,

NOTE Confidence: 0.912706339

00:54:28.760 --> 00:54:30.748 go to overall, you have your number

NOTE Confidence: 0.912706339

00:54:30.748 --> 00:54:32.508 right here and you can export

NOTE Confidence: 0.912706339

00:54:32.508 --> 00:54:33.900 that number out using this button.

NOTE Confidence: 0.912706339

00:54:33.900 --> 00:54:34.800 You can write it down.

NOTE Confidence: 0.912706339

00:54:34.800 --> 00:54:36.040 You can do a lot of different stuff

NOTE Confidence: 0.912706339

00:54:36.040 --> 00:54:37.480 to kind of get that numbers out there,

NOTE Confidence: 0.912706339

00:54:37.480 --> 00:54:38.968 but you can get some numbers

NOTE Confidence: 0.912706339

00:54:38.968 --> 00:54:39.960 there from the structure.

NOTE Confidence: 0.912706339

00:54:39.960 --> 00:54:42.976 And again, you can turn on your structure

NOTE Confidence: 0.912706339

00:54:42.976 --> 00:54:45.464 here and identify those structures.

NOTE Confidence: 0.912706339

00:54:45.464 --> 00:54:47.624 Now visually, you might want to

NOTE Confidence: 0.912706339

00:54:47.624 --> 00:54:49.280 make this a little bit prettier.

NOTE Confidence: 0.912706339

00:54:49.280 --> 00:54:50.952 Switch this off here.

NOTE Confidence: 0.912706339

00:54:50.952 --> 00:54:54.997 Say you wanted to turn this on to base color.

NOTE Confidence: 0.912706339

00:54:55.000 --> 00:54:56.884 Make it red.

NOTE Confidence: 0.912706339

00:54:56.884 --> 00:54:59.940 I can make it transparent.

NOTE Confidence: 0.912706339

00:54:59.940 --> 00:55:00.480 My

NOTE Confidence: 0.406318253333333

00:55:11.600 --> 00:55:15.319 colors are weird. My colors? Weird.

NOTE Confidence: 0.469600808333333

00:55:21.520 --> 00:55:24.196 Black. Interesting. All right, Black second

NOTE Confidence: 0.66858949125

00:55:29.000 --> 00:55:31.320 here. Oh, I'm not sure why they're black. Let

NOTE Confidence: 0.855319366666667

00:55:35.840 --> 00:55:36.878 me just save this real quick.

NOTE Confidence: 0.855319366666667

00:55:36.880 --> 00:55:39.715 When I'm going to reopen the file,

NOTE Confidence: 0.855319366666667

00:55:39.720 --> 00:55:40.745 something's wrong with my graphics

NOTE Confidence: 0.855319366666667

00:55:40.745 --> 00:55:41.920 card here. They shouldn't be black,

NOTE Confidence: 0.611925132857143

00:55:45.040 --> 00:55:46.517 it's just re saving the image here.

NOTE Confidence: 0.5155639

00:55:53.680 --> 00:55:53.800 Yeah,

NOTE Confidence: 0.731923017272727

00:55:59.160 --> 00:56:00.786 so the idea is that you

NOTE Confidence: 0.731923017272727

00:56:00.786 --> 00:56:02.400 can make a little better.

NOTE Confidence: 0.731923017272727

00:56:02.400 --> 00:56:05.196 Yeah instead of graphics glitch there,

NOTE Confidence: 0.731923017272727

00:56:05.200 --> 00:56:07.440 you can make these a little bit transparent.

NOTE Confidence: 0.731923017272727

00:56:07.440 --> 00:56:08.944 So for example if I want to show

NOTE Confidence: 0.731923017272727

00:56:08.944 --> 00:56:10.559 just the ones that are overlapping,

NOTE Confidence: 0.731923017272727

00:56:10.560 --> 00:56:12.352 there they are, right?

NOTE Confidence: 0.731923017272727

00:56:12.352 --> 00:56:15.790 And if I zoom in, you can make a movie

NOTE Confidence: 0.731923017272727

00:56:15.790 --> 00:56:17.537 and you can actually show them which

NOTE Confidence: 0.731923017272727

00:56:17.537 --> 00:56:19.319 ones are inside of the structure.

NOTE Confidence: 0.731923017272727

00:56:19.320 --> 00:56:20.517 And you can say, since I did,

NOTE Confidence: 0.731923017272727

00:56:20.520 --> 00:56:21.600 I did like 2 microns.

NOTE Confidence: 0.731923017272727

00:56:21.600 --> 00:56:22.624 Some of them are going to be a

NOTE Confidence: 0.731923017272727

00:56:22.624 --> 00:56:23.600 little bit outside the structure.

NOTE Confidence: 0.731923017272727

00:56:23.600 --> 00:56:24.932 But again, you can set that

NOTE Confidence: 0.731923017272727

00:56:24.932 --> 00:56:26.080 threshold to whatever you want.

NOTE Confidence: 0.731923017272727

00:56:26.080 --> 00:56:27.480 You can set the ones that are overlapping,

NOTE Confidence: 0.731923017272727

00:56:27.480 --> 00:56:30.035 only the ones that are totally inside.

NOTE Confidence: 0.731923017272727

00:56:30.040 --> 00:56:31.118 There's a lot of different features here,

NOTE Confidence: 0.731923017272727

00:56:31.120 --> 00:56:32.968 but the idea is that you can

NOTE Confidence: 0.731923017272727

00:56:32.968 --> 00:56:34.710 really render these guys kind of

NOTE Confidence: 0.731923017272727

00:56:34.710 --> 00:56:36.720 interesting ways to kind of visualize

NOTE Confidence: 0.731923017272727

00:56:36.720 --> 00:56:37.719 structures inside structures.

NOTE Confidence: 0.731923017272727

00:56:37.719 --> 00:56:40.637 You can do the same type of analysis with

NOTE Confidence: 0.731923017272727

00:56:40.637 --> 00:56:43.559 this box as well and you can do that as well.

NOTE Confidence: 0.731923017272727

00:56:43.560 --> 00:56:44.834 So what are we at 10:30 here?

NOTE Confidence: 0.731923017272727

00:56:44.840 --> 00:56:48.770 OK, so I'm going to move on

NOTE Confidence: 0.731923017272727

00:56:48.770 --> 00:56:49.715 here from surfaces.

NOTE Confidence: 0.731923017272727

00:56:49.720 --> 00:56:50.911 I'm going to jump very, very,

NOTE Confidence: 0.731923017272727

00:56:50.911 --> 00:56:52.297 very quickly just to kind of

NOTE Confidence: 0.731923017272727

00:56:52.297 --> 00:56:53.759 give you a quick preview.

NOTE Confidence: 0.731923017272727

00:56:53.760 --> 00:56:55.302 There's a couple of really great

NOTE Confidence: 0.731923017272727

00:56:55.302 --> 00:56:57.077 tutorials that I can I can point

NOTE Confidence: 0.731923017272727

00:56:57.077 --> 00:56:58.469 you to moving forward through our

NOTE Confidence: 0.731923017272727

00:56:58.469 --> 00:57:00.127 in our Learning Center that I made

NOTE Confidence: 0.731923017272727

00:57:00.127 --> 00:57:02.096 a few years ago or just last year,

NOTE Confidence: 0.731923017272727

00:57:02.096 --> 00:57:04.877 a year and a half ago about filament tracer.

NOTE Confidence: 0.731923017272727

00:57:04.877 --> 00:57:07.271 So filament tracer is a feature

NOTE Confidence: 0.731923017272727

00:57:07.271 --> 00:57:09.266 of a Morris where especially for

NOTE Confidence: 0.731923017272727

00:57:09.266 --> 00:57:10.358 data sets like this.

NOTE Confidence: 0.731923017272727

00:57:10.360 --> 00:57:10.974 And again,

NOTE Confidence: 0.731923017272727

00:57:10.974 --> 00:57:12.509 I don't know exactly what

NOTE Confidence: 0.731923017272727

00:57:12.509 --> 00:57:13.720 your strong suits are,

NOTE Confidence: 0.731923017272727

00:57:13.720 --> 00:57:14.533 the core facility,

NOTE Confidence: 0.731923017272727

00:57:14.533 --> 00:57:16.760 so there's a lot of different features and

NOTE Confidence: 0.731923017272727

00:57:16.760 --> 00:57:19.160 and images that people are going to get.

NOTE Confidence: 0.731923017272727

00:57:19.160 --> 00:57:21.680 But film and tracing is a tool that has

NOTE Confidence: 0.731923017272727

00:57:21.680 --> 00:57:25.200 a lot of different options to be able to use.

NOTE Confidence: 0.731923017272727

00:57:25.200 --> 00:57:26.264 In this particular case,

NOTE Confidence: 0.731923017272727

00:57:26.264 --> 00:57:27.860 someone might want to try to

NOTE Confidence: 0.731923017272727

00:57:27.919 --> 00:57:29.479 measure the number of branches,

NOTE Confidence: 0.731923017272727

00:57:29.480 --> 00:57:30.662 the terminal points,

NOTE Confidence: 0.731923017272727

00:57:30.662 --> 00:57:34.240 size of the Somas and and things like that.

NOTE Confidence: 0.731923017272727

00:57:34.240 --> 00:57:34.380 Again,

NOTE Confidence: 0.731923017272727

00:57:34.380 --> 00:57:35.080 I'm not going to walk

NOTE Confidence: 0.731923017272727

00:57:35.080 --> 00:57:35.640 through the wizard here,

NOTE Confidence: 0.731923017272727

00:57:35.640 --> 00:57:37.344 I'm just going to show you kind of

NOTE Confidence: 0.731923017272727

00:57:37.344 --> 00:57:39.678 pointing fact kind of the end result

NOTE Confidence: 0.731923017272727

00:57:39.680 --> 00:57:41.136 where you can identify as long as

NOTE Confidence: 0.731923017272727

00:57:41.136 --> 00:57:42.760 you have a nice starting point.

NOTE Confidence: 0.731923017272727

00:57:42.760 --> 00:57:44.644 In this case we do nice little soma

NOTE Confidence: 0.731923017272727

00:57:44.644 --> 00:57:46.929 we can come up here and we can create

NOTE Confidence: 0.731923017272727

00:57:46.929 --> 00:57:48.519 something that looks like that.

NOTE Confidence: 0.731923017272727

00:57:48.520 --> 00:57:52.016 So this is not going to be exactly

NOTE Confidence: 0.731923017272727

00:57:52.016 --> 00:57:54.016 the same as the surface rendering.

NOTE Confidence: 0.731923017272727

00:57:54.016 --> 00:57:55.920 It might look a little bit different

NOTE Confidence: 0.731923017272727

00:57:55.920 --> 00:57:57.558 depending on where your seat points are

NOTE Confidence: 0.731923017272727

00:57:57.558 --> 00:57:59.197 in the training and things like that.

NOTE Confidence: 0.731923017272727

00:57:59.200 --> 00:58:02.675 But the idea is as long as you do

NOTE Confidence: 0.731923017272727

00:58:02.675 --> 00:58:04.234 even nice clean data set and you can

NOTE Confidence: 0.731923017272727

00:58:04.234 --> 00:58:05.839 kind of clean the files up to kind

NOTE Confidence: 0.731923017272727

00:58:05.839 --> 00:58:07.357 of get where their structures are,

NOTE Confidence: 0.731923017272727

00:58:07.360 --> 00:58:09.520 we get a statistic here,

NOTE Confidence: 0.731923017272727

00:58:09.520 --> 00:58:10.960 click on the filament object.

NOTE Confidence: 0.731923017272727

00:58:10.960 --> 00:58:12.960 We have a filament that looks like that.

NOTE Confidence: 0.731923017272727

00:58:12.960 --> 00:58:14.780 And so from this particular

NOTE Confidence: 0.731923017272727

00:58:14.780 --> 00:58:16.632 structure we can get detailed

NOTE Confidence: 0.731923017272727

00:58:16.632 --> 00:58:18.200 information about that filament.

NOTE Confidence: 0.731923017272727

00:58:18.200 --> 00:58:20.800 We can get SOMA size.

NOTE Confidence: 0.731923017272727

00:58:20.800 --> 00:58:23.158 So we do have now Soma that we've identified.

NOTE Confidence: 0.744587671818182

00:58:23.160 --> 00:58:24.360 You can see the Soma as

NOTE Confidence: 0.744587671818182

00:58:24.360 --> 00:58:25.560 blue dots in the middle.

NOTE Confidence: 0.744587671818182

00:58:25.560 --> 00:58:26.436 So you can come up here.

NOTE Confidence: 0.744587671818182

00:58:26.440 --> 00:58:28.114 If you do it right and you have a

NOTE Confidence: 0.744587671818182

00:58:28.114 --> 00:58:31.400 nice data set, you can get SOMA,

NOTE Confidence: 0.744587671818182

00:58:31.400 --> 00:58:33.400 there's volume, soma volume, right.

NOTE Confidence: 0.744587671818182

00:58:33.400 --> 00:58:34.720 So there's the soma volume.

NOTE Confidence: 0.744587671818182

00:58:34.720 --> 00:58:37.240 That's the structure of that structure there.

NOTE Confidence: 0.744587671818182

00:58:37.240 --> 00:58:38.598 And getting the size of that soma,

NOTE Confidence: 0.744587671818182

00:58:38.600 --> 00:58:40.305 Soma volume is sometimes something

NOTE Confidence: 0.744587671818182

00:58:40.305 --> 00:58:42.392 people really want in terms of

NOTE Confidence: 0.744587671818182

00:58:42.392 --> 00:58:43.997 morphology and things like that.

NOTE Confidence: 0.744587671818182

00:58:44.000 --> 00:58:46.016 Most people are looking for things like

NOTE Confidence: 0.744587671818182

00:58:46.016 --> 00:58:47.852 branch level, number of branch points,

NOTE Confidence: 0.744587671818182

00:58:47.852 --> 00:58:49.232 you know, number of branch points.

NOTE Confidence: 0.744587671818182

00:58:49.232 --> 00:58:51.360 There we go. This guy here has four,

NOTE Confidence: 0.744587671818182

00:58:51.360 --> 00:58:53.000 you know, 14 branch points.

NOTE Confidence: 0.744587671818182

00:58:53.000 --> 00:58:55.720 It's tiny. This guy here,

NOTE Confidence: 0.744587671818182

00:58:55.720 --> 00:58:56.824 110 branch points, right?

NOTE Confidence: 0.744587671818182

00:58:56.824 --> 00:58:58.904 We can kind of identify the complexity

NOTE Confidence: 0.744587671818182

00:58:58.904 --> 00:58:59.999 of the structure.

NOTE Confidence: 0.744587671818182

00:59:00.000 --> 00:59:01.956 Now again, the cleaner the data,

NOTE Confidence: 0.744587671818182

00:59:01.960 --> 00:59:02.780 the better the structure,

NOTE Confidence: 0.744587671818182

00:59:02.780 --> 00:59:04.480 the more accurate this trace is going to be.

NOTE Confidence: 0.744587671818182

00:59:04.480 --> 00:59:06.144 But this was done all 100%

NOTE Confidence: 0.744587671818182

00:59:06.144 --> 00:59:07.840 automatically identifying the soma,

NOTE Confidence: 0.744587671818182

00:59:07.840 --> 00:59:09.244 finding the C points and it

NOTE Confidence: 0.744587671818182

00:59:09.244 --> 00:59:10.880 traces this path as best you can.

NOTE Confidence: 0.744587671818182

00:59:10.880 --> 00:59:12.960 And so you can apply this to multiple

NOTE Confidence: 0.744587671818182

00:59:12.960 --> 00:59:15.248 images and get a good idea of the the

NOTE Confidence: 0.744587671818182

00:59:15.248 --> 00:59:16.958 complexity of some of these neurons,

NOTE Confidence: 0.744587671818182

00:59:16.960 --> 00:59:19.120 whether it's number of branch points,

NOTE Confidence: 0.744587671818182

00:59:19.120 --> 00:59:20.600 number of terminal points.

NOTE Confidence: 0.8530550775

00:59:22.640 --> 00:59:24.680 There's a Shoal analysis in here as well.

NOTE Confidence: 0.8530550775

00:59:24.680 --> 00:59:26.055 If you're interested in Shoal

NOTE Confidence: 0.8530550775

00:59:26.055 --> 00:59:27.155 analysis through Shoal intersections,

NOTE Confidence: 0.8530550775

00:59:27.160 --> 00:59:28.581 you get the number Shoal intersections for

NOTE Confidence: 0.8530550775

00:59:28.581 --> 00:59:30.319 each one of these filaments on their own.

NOTE Confidence: 0.8530550775

00:59:30.320 --> 00:59:32.416 It's a lot of different ways to kind

NOTE Confidence: 0.8530550775

00:59:32.416 --> 00:59:34.120 of measure dendrite complexity.

NOTE Confidence: 0.8530550775

00:59:34.120 --> 00:59:35.268 Like I said, if you have some

NOTE Confidence: 0.8530550775

00:59:35.268 --> 00:59:36.320 data sets that are like this,

NOTE Confidence: 0.8530550775

00:59:36.320 --> 00:59:38.516 this would be a whole hour and a half

NOTE Confidence: 0.8530550775

00:59:38.516 --> 00:59:39.992 session on its own just to talk about

NOTE Confidence: 0.8530550775

00:59:39.992 --> 00:59:41.362 how to do film and tracer and the

NOTE Confidence: 0.8530550775

00:59:41.362 --> 00:59:42.520 different methods there to do that.

NOTE Confidence: 0.8530550775

00:59:42.520 --> 00:59:43.955 If you have any questions on that,

NOTE Confidence: 0.8530550775

00:59:43.960 --> 00:59:45.720 please just reach out to the support team,

NOTE Confidence: 0.8530550775

00:59:45.720 --> 00:59:46.500 send me some files.

NOTE Confidence: 0.8530550775

00:59:46.500 --> 00:59:48.047 We can walk through it together to do

NOTE Confidence: 0.8530550775

00:59:48.047 --> 00:59:49.391 a little bit of more in depth training

NOTE Confidence: 0.8530550775

00:59:49.435 --> 00:59:50.779 or you can watch some of the videos

NOTE Confidence: 0.8530550775

00:59:50.779 --> 00:59:53.633 that are on on our website to kind of

NOTE Confidence: 0.8530550775

00:59:53.633 --> 00:59:56.878 learn a little bit about how that works.

NOTE Confidence: 0.8530550775

00:59:56.880 --> 00:59:58.266 One of the things I also wanted

NOTE Confidence: 0.8530550775

00:59:58.266 --> 01:00:00.118 to kind of bring up today that I

NOTE Confidence: 0.8530550775

01:00:00.118 --> 01:00:01.597 think is really important for kind

NOTE Confidence: 0.8530550775

01:00:01.597 --> 01:00:03.405 of new users to kind of know and

NOTE Confidence: 0.8530550775

01:00:03.405 --> 01:00:05.185 understand what it's doing and why

NOTE Confidence: 0.8530550775

01:00:05.185 --> 01:00:07.457 it's there because I kind of glanced

NOTE Confidence: 0.8530550775

01:00:07.457 --> 01:00:08.972 through it in the wizard process.

NOTE Confidence: 0.8530550775

01:00:08.972 --> 01:00:10.839 So I'm going to switch gears a little bit.

NOTE Confidence: 0.8530550775

01:00:10.840 --> 01:00:11.896 I'm going to get away from

NOTE Confidence: 0.8530550775

01:00:11.896 --> 01:00:12.600 this particular data set.

NOTE Confidence: 0.8530550775

01:00:12.600 --> 01:00:15.678 I'm going to move to a 2D data set.

NOTE Confidence: 0.8530550775

01:00:15.680 --> 01:00:17.696 Now, 2D data sets work just

NOTE Confidence: 0.8530550775

01:00:17.696 --> 01:00:19.706 as well as as 3D data sets,

NOTE Confidence: 0.8530550775

01:00:19.706 --> 01:00:21.548 but the idea here is I wanted to

NOTE Confidence: 0.8530550775

01:00:21.548 --> 01:00:23.372 show you a feature that I think is

NOTE Confidence: 0.8530550775

01:00:23.372 --> 01:00:25.088 really interesting and it can be used

NOTE Confidence: 0.8530550775

01:00:25.088 --> 01:00:26.659 across the board, whether it's 2D,

NOTE Confidence: 0.8530550775

01:00:26.659 --> 01:00:28.278 whether it's 3D, whether it's whatever.

NOTE Confidence: 0.8530550775

01:00:28.278 --> 01:00:29.874 And this is a data set.

NOTE Confidence: 0.8530550775

01:00:29.880 --> 01:00:33.120 This here is a brain slice.

NOTE Confidence: 0.8530550775

01:00:33.120 --> 01:00:34.800 Again, it's just an example.

NOTE Confidence: 0.8530550775

01:00:34.800 --> 01:00:36.200 I know, I don't know if you're all

NOTE Confidence: 0.8530550775

01:00:36.200 --> 01:00:37.341 neuroscientist or not, but I am.

NOTE Confidence: 0.8530550775

01:00:37.341 --> 01:00:39.127 So I get really excited when I see

NOTE Confidence: 0.8530550775

01:00:39.127 --> 01:00:41.080 brain and neurons and things like that.

NOTE Confidence: 0.8530550775

01:00:41.080 --> 01:00:43.200 But in this particular example,

NOTE Confidence: 0.8530550775

01:00:43.200 --> 01:00:45.876 this is a single brain slice.

NOTE Confidence: 0.8530550775

01:00:45.880 --> 01:00:46.720 You can see the tissue,

NOTE Confidence: 0.8530550775

01:00:46.720 --> 01:00:48.525 the curve of the brain Here,

NOTE Confidence: 0.8530550775

01:00:48.525 --> 01:00:50.520 I think it's a cortex or something.

NOTE Confidence: 0.8530550775

01:00:50.520 --> 01:00:51.186 Exactly.

NOTE Confidence: 0.8530550775

01:00:51.186 --> 01:00:51.852 Sure.

NOTE Confidence: 0.8530550775

01:00:51.852 --> 01:00:53.184 Hippocampus, actually.

NOTE Confidence: 0.8530550775

01:00:53.184 --> 01:00:58.110 And so the idea is the the user wants to be

NOTE Confidence: 0.8530550775

01:00:58.110 --> 01:01:00.678 able to count these cells Now in this image,

NOTE Confidence: 0.8530550775

01:01:00.680 --> 01:01:01.559 whether it's red,

NOTE Confidence: 0.8530550775

01:01:01.559 --> 01:01:02.438 green or blue,

NOTE Confidence: 0.8530550775

01:01:02.440 --> 01:01:05.080 whatever channel you're looking in,

NOTE Confidence: 0.8530550775

01:01:05.080 --> 01:01:06.890 it's not just labeling cell bodies, right.

NOTE Confidence: 0.8530550775

01:01:06.890 --> 01:01:08.360 So if you look at this channel,

NOTE Confidence: 0.8530550775

01:01:08.360 --> 01:01:11.279 it's labeling a lot of other stuff.

NOTE Confidence: 0.8530550775

01:01:11.280 --> 01:01:14.055 So that makes it really

NOTE Confidence: 0.8530550775

01:01:14.055 --> 01:01:16.090 difficult to render cells.

NOTE Confidence: 0.8530550775

01:01:16.090 --> 01:01:18.680 Now there's other cells in here too.

NOTE Confidence: 0.8530550775

01:01:18.680 --> 01:01:19.556 Then this is a brain slice.

NOTE Confidence: 0.8530550775

01:01:19.560 --> 01:01:21.000 There's a thousands of other cells in here.

NOTE Confidence: 0.8530550775

01:01:21.000 --> 01:01:23.079 So if you did Dappy or something like that,

NOTE Confidence: 0.8530550775

01:01:23.080 --> 01:01:25.145 you would have Dappy cells and neurons

NOTE Confidence: 0.8530550775

01:01:25.145 --> 01:01:26.680 everywhere out throughout the data set.

NOTE Confidence: 0.8530550775

01:01:26.680 --> 01:01:28.856 So we want to try to render these

NOTE Confidence: 0.8530550775

01:01:28.856 --> 01:01:30.260 guys with a spot and then maybe

NOTE Confidence: 0.8530550775

01:01:30.260 --> 01:01:31.400 they want to count the cells,

NOTE Confidence: 0.8530550775

01:01:31.400 --> 01:01:32.600 maybe they want to look

NOTE Confidence: 0.8530550775

01:01:32.600 --> 01:01:33.080 for colloquialization.

NOTE Confidence: 0.8530550775

01:01:33.080 --> 01:01:33.884 In this particular case,

NOTE Confidence: 0.8530550775

01:01:33.884 --> 01:01:35.640 they wanted to look for triple cologue cells.

NOTE Confidence: 0.8530550775

01:01:35.640 --> 01:01:38.760 The CFVCFPYFP and these DS red

NOTE Confidence: 0.8530550775

01:01:38.760 --> 01:01:40.240 cells label three different markers.

NOTE Confidence: 0.78727127

01:01:40.240 --> 01:01:40.960 They wanted to say, hey,

NOTE Confidence: 0.78727127

01:01:40.960 --> 01:01:42.640 which ones are labeled with what.

NOTE Confidence: 0.78727127

01:01:42.640 --> 01:01:45.760 Now the challenge is when you do,

NOTE Confidence: 0.78727127

01:01:45.760 --> 01:01:47.360 for example, spot detection

NOTE Confidence: 0.78727127

01:01:47.360 --> 01:01:49.440 for the green cells,

NOTE Confidence: 0.78727127

01:01:49.440 --> 01:01:51.912 what you get is something that looks like

NOTE Confidence: 0.78727127

01:01:51.912 --> 01:01:54.320 that this is the raw quantification, right?

NOTE Confidence: 0.78727127

01:01:54.320 --> 01:01:56.885 You get spots everywhere, right?

NOTE Confidence: 0.78727127

01:01:56.885 --> 01:01:58.835 We're we're identifying the spots here.

NOTE Confidence: 0.78727127

01:01:58.840 --> 01:02:00.569 We're also getting all these spots along

NOTE Confidence: 0.78727127

01:02:00.569 --> 01:02:02.278 these axons and all these spots here,

NOTE Confidence: 0.78727127

01:02:02.280 --> 01:02:03.876 but all the cells are pretty

NOTE Confidence: 0.78727127

01:02:03.876 --> 01:02:04.674 detected pretty well.

NOTE Confidence: 0.78727127

01:02:04.680 --> 01:02:06.144 That's a single slice because some of them

NOTE Confidence: 0.78727127

01:02:06.144 --> 01:02:07.679 are going to be a little bit out of focus.

NOTE Confidence: 0.78727127

01:02:07.680 --> 01:02:09.025 But for the most part, again,

NOTE Confidence: 0.78727127

01:02:09.025 --> 01:02:10.690 you're going to have to take that for what

NOTE Confidence: 0.78727127

01:02:10.729 --> 01:02:12.232 it is because it is just a single slice.

NOTE Confidence: 0.78727127

01:02:12.240 --> 01:02:14.011 But the idea is we're trying to

NOTE Confidence: 0.78727127

01:02:14.011 --> 01:02:15.794 identify all the cells that are in

NOTE Confidence: 0.78727127

01:02:15.794 --> 01:02:18.560 focus in this field and quantify them.

NOTE Confidence: 0.78727127

01:02:18.560 --> 01:02:20.410 But part of the problem is as you lower the

NOTE Confidence: 0.78727127

01:02:20.458 --> 01:02:22.394 threshold to detect some of the dimmer cells,

NOTE Confidence: 0.78727127

01:02:22.400 --> 01:02:24.080 even even some of the brighter cells,

NOTE Confidence: 0.78727127

01:02:24.080 --> 01:02:26.810 you get a lot of false positive

NOTE Confidence: 0.78727127

01:02:26.810 --> 01:02:29.235 counts with this particular process.

NOTE Confidence: 0.78727127

01:02:29.240 --> 01:02:32.136 Now with the Morris, we have a great

NOTE Confidence: 0.78727127

01:02:32.136 --> 01:02:34.599 tool that's built into the wizard.

NOTE Confidence: 0.78727127

01:02:34.600 --> 01:02:35.236 Now I didn't.

NOTE Confidence: 0.78727127

01:02:35.236 --> 01:02:36.508 I'm going to just rebuild it

NOTE Confidence: 0.78727127

01:02:36.508 --> 01:02:37.678 here from the start here.

NOTE Confidence: 0.78727127

01:02:37.680 --> 01:02:38.744 So it's called classification.

NOTE Confidence: 0.78727127

01:02:38.744 --> 01:02:40.978 So when you start a new spots object

NOTE Confidence: 0.78727127

01:02:40.978 --> 01:02:42.718 or surface object for that matter,

NOTE Confidence: 0.78727127

01:02:42.720 --> 01:02:45.756 there's this classify objects spots again,

NOTE Confidence: 0.78727127

01:02:45.760 --> 01:02:46.834 often I start with it turned

NOTE Confidence: 0.78727127

01:02:46.834 --> 01:02:47.998 off and then if I need it,

NOTE Confidence: 0.78727127

01:02:48.000 --> 01:02:49.120 I go back and I turn it on.

NOTE Confidence: 0.78727127

01:02:49.120 --> 01:02:50.000 If I know I'm going to use it,

NOTE Confidence: 0.78727127

01:02:50.000 --> 01:02:51.080 then I'll turn it on.

NOTE Confidence: 0.78727127

01:02:51.080 --> 01:02:53.537 But basically it's a label feature where

NOTE Confidence: 0.78727127

01:02:53.537 --> 01:02:56.334 you can have it learn through machine

NOTE Confidence: 0.78727127

01:02:56.334 --> 01:02:59.240 learning and and standard filtering as well.

NOTE Confidence: 0.78727127

01:02:59.240 --> 01:03:00.443 Have it label,

NOTE Confidence: 0.78727127

01:03:00.443 --> 01:03:02.448 identify and classify one object

NOTE Confidence: 0.78727127

01:03:02.448 --> 01:03:04.239 into into one category,

NOTE Confidence: 0.78727127

01:03:04.240 --> 01:03:06.410 another object in another category

NOTE Confidence: 0.78727127

01:03:06.410 --> 01:03:08.504 based on the the the structures

NOTE Confidence: 0.78727127

01:03:08.504 --> 01:03:10.034 that you that you segmented.

NOTE Confidence: 0.78727127

01:03:10.040 --> 01:03:11.777 This is the last step in the one of

NOTE Confidence: 0.78727127

01:03:11.777 --> 01:03:13.558 the last steps in the segmentation.

NOTE Confidence: 0.78727127

01:03:13.560 --> 01:03:14.800 After you've created the segmentation,

NOTE Confidence: 0.78727127

01:03:14.800 --> 01:03:16.160 whether you do pixel classification,

NOTE Confidence: 0.78727127

01:03:16.160 --> 01:03:17.804 spot detection, regular creation,

NOTE Confidence: 0.78727127

01:03:17.804 --> 01:03:19.037 doesn't really matter.

NOTE Confidence: 0.78727127

01:03:19.040 --> 01:03:20.615 This last step is going to take

NOTE Confidence: 0.78727127

01:03:20.615 --> 01:03:21.760 that whatever you rendered,

NOTE Confidence: 0.78727127

01:03:21.760 --> 01:03:23.888 whatever you detected and try to classify

NOTE Confidence: 0.78727127

01:03:23.888 --> 01:03:26.516 them based on the training that you give it.

NOTE Confidence: 0.78727127

01:03:26.520 --> 01:03:28.004 And so this is another level of

NOTE Confidence: 0.78727127

01:03:28.004 --> 01:03:29.333 machine learning instead of kind of

NOTE Confidence: 0.78727127

01:03:29.333 --> 01:03:30.413 pixel based machine learning where

NOTE Confidence: 0.78727127

01:03:30.413 --> 01:03:31.891 you're kind of using it to kind of

NOTE Confidence: 0.78727127

01:03:31.891 --> 01:03:33.289 select the pixels and make the surface.

NOTE Confidence: 0.78727127

01:03:33.289 --> 01:03:35.421 This is more of an object based machine

NOTE Confidence: 0.78727127

01:03:35.421 --> 01:03:37.677 learning which the objects already generated.

NOTE Confidence: 0.78727127

01:03:37.680 --> 01:03:39.836 There are statistics related to that object,

NOTE Confidence: 0.78727127

01:03:39.840 --> 01:03:41.184 various different statistics and

NOTE Confidence: 0.78727127

01:03:41.184 --> 01:03:43.200 it's going to try to categorize

NOTE Confidence: 0.78727127

01:03:43.252 --> 01:03:44.877 them based on those statistics,

NOTE Confidence: 0.78727127

01:03:44.880 --> 01:03:45.864 lot of different statistics.

NOTE Confidence: 0.78727127

01:03:45.864 --> 01:03:48.137 And so I'm going to kind of jump through

NOTE Confidence: 0.78727127

01:03:48.137 --> 01:03:51.360 here again, I'm not going to spend,

NOTE Confidence: 0.78727127

01:03:51.360 --> 01:03:52.645 OK, I'm going to do this, sorry,

NOTE Confidence: 0.78727127

01:03:52.645 --> 01:03:54.595 I'm going to delete this here,

NOTE Confidence: 0.78727127

01:03:54.600 --> 01:03:55.536 I'm going to go,

NOTE Confidence: 0.78727127

01:03:55.536 --> 01:03:57.440 I'm just going to rebuild this guy here,

NOTE Confidence: 0.78727127

01:03:57.440 --> 01:03:57.740 right.

NOTE Confidence: 0.78727127

01:03:57.740 --> 01:03:59.240 So we do classify spots.

NOTE Confidence: 0.78727127

01:03:59.240 --> 01:04:01.640 I did A7 Micron spot size.

NOTE Confidence: 0.78727127

01:04:01.640 --> 01:04:03.610 You come in here and you get a whole bunch

NOTE Confidence: 0.915549940833333

01:04:03.664 --> 01:04:04.340 of spots right?

NOTE Confidence: 0.915549940833333

01:04:04.340 --> 01:04:06.624 So I set this to 184 right?

NOTE Confidence: 0.915549940833333

01:04:06.624 --> 01:04:10.560 184 is fine. If I set it too low here,

NOTE Confidence: 0.915549940833333

01:04:10.560 --> 01:04:13.160 you might miss some spots,

NOTE Confidence: 0.915549940833333

01:04:13.160 --> 01:04:14.039 might miss themselves,

NOTE Confidence: 0.915549940833333

01:04:14.039 --> 01:04:15.797 maybe they're not quite in focus,

NOTE Confidence: 0.915549940833333

01:04:15.800 --> 01:04:16.997 maybe you don't want to include them.

NOTE Confidence: 0.915549940833333

01:04:17.000 --> 01:04:18.834 But even if you did include them,

NOTE Confidence: 0.915549940833333

01:04:18.840 --> 01:04:20.160 there's still some spots out

NOTE Confidence: 0.915549940833333

01:04:20.160 --> 01:04:21.480 here that you don't want.

NOTE Confidence: 0.915549940833333

01:04:21.480 --> 01:04:22.956 But the idea is that I want to try

NOTE Confidence: 0.915549940833333

01:04:22.956 --> 01:04:24.469 to count all the spots that I can

NOTE Confidence: 0.915549940833333

01:04:24.469 --> 01:04:25.920 that are in this field of view,

NOTE Confidence: 0.915549940833333

01:04:25.920 --> 01:04:27.754 even those dim guys that are there.

NOTE Confidence: 0.915549940833333

01:04:27.760 --> 01:04:29.596 So I lower this threshold a little bit more.

NOTE Confidence: 0.915549940833333

01:04:29.600 --> 01:04:31.472 And when I when I set it really low,

NOTE Confidence: 0.915549940833333

01:04:31.480 --> 01:04:33.720 I get a lot of background and noise.

NOTE Confidence: 0.915549940833333

01:04:33.720 --> 01:04:36.186 So I set this to like 184

NOTE Confidence: 0.915549940833333

01:04:36.186 --> 01:04:37.716 or whatever it was here,

NOTE Confidence: 0.915549940833333

01:04:37.720 --> 01:04:39.232 but you get a lot of different spots here.

NOTE Confidence: 0.915549940833333

01:04:39.240 --> 01:04:40.752 And then when I go to the next step,

NOTE Confidence: 0.913612828461539

01:04:43.080 --> 01:04:44.627 you can see I've already done the

NOTE Confidence: 0.913612828461539

01:04:44.627 --> 01:04:46.400 training here in this particular example.

NOTE Confidence: 0.913612828461539

01:04:46.400 --> 01:04:48.368 But the idea is that you have this

NOTE Confidence: 0.913612828461539

01:04:48.368 --> 01:04:49.679 training data set under here,

NOTE Confidence: 0.913612828461539

01:04:49.680 --> 01:04:51.640 there's a a classification step,

NOTE Confidence: 0.913612828461539

01:04:51.640 --> 01:04:53.040 you create a new classification,

NOTE Confidence: 0.913612828461539

01:04:53.040 --> 01:04:54.240 hit this drop down menu,

NOTE Confidence: 0.913612828461539

01:04:54.240 --> 01:04:55.998 come down here to machine learning.

NOTE Confidence: 0.913612828461539

01:04:56.000 --> 01:04:57.440 And the idea is pretty simple.

NOTE Confidence: 0.913612828461539

01:04:57.440 --> 01:04:59.150 You're going to train which ones

NOTE Confidence: 0.913612828461539

01:04:59.150 --> 01:05:01.078 are real and which ones are not.

NOTE Confidence: 0.913612828461539

01:05:01.080 --> 01:05:02.640 So I'm going to, I'm going to keep this one,

NOTE Confidence: 0.913612828461539

01:05:02.640 --> 01:05:04.500 but I'm going to just create a brand new one

NOTE Confidence: 0.913612828461539

01:05:04.551 --> 01:05:06.272 here just to show how it works here, right.

NOTE Confidence: 0.913612828461539

01:05:06.272 --> 01:05:08.000 So if I come in here and I say,

NOTE Confidence: 0.913612828461539

01:05:08.000 --> 01:05:08.636 you know what?

NOTE Confidence: 0.913612828461539

01:05:08.636 --> 01:05:10.120 I know all these guys are garbage.

NOTE Confidence: 0.913612828461539

01:05:10.120 --> 01:05:11.275 So I can hold down control and

NOTE Confidence: 0.913612828461539

01:05:11.275 --> 01:05:12.678 I can say I can come down here,

NOTE Confidence: 0.913612828461539

01:05:12.680 --> 01:05:13.760 I know those are all garbage.

NOTE Confidence: 0.913612828461539

01:05:13.760 --> 01:05:14.417 I can select,

NOTE Confidence: 0.913612828461539

01:05:14.417 --> 01:05:16.760 I can select a lot of these really easily.

NOTE Confidence: 0.913612828461539

01:05:16.760 --> 01:05:17.484 These are all garbage.

NOTE Confidence: 0.913612828461539

01:05:17.484 --> 01:05:18.794 And I want to select as many

NOTE Confidence: 0.913612828461539

01:05:18.794 --> 01:05:19.518 as I possibly can.

NOTE Confidence: 0.913612828461539

01:05:19.520 --> 01:05:21.152 Not only ones that are down

NOTE Confidence: 0.913612828461539

01:05:21.152 --> 01:05:22.240 here that are garbage,

NOTE Confidence: 0.913612828461539

01:05:22.240 --> 01:05:24.158 but also ones that are up here,

NOTE Confidence: 0.913612828461539

01:05:24.160 --> 01:05:25.450 that are garbage, that have dimmer

NOTE Confidence: 0.913612828461539

01:05:25.450 --> 01:05:26.520 backgrounds and things like that.

NOTE Confidence: 0.913612828461539

01:05:26.520 --> 01:05:29.159 I'm going to put those into Class

NOTE Confidence: 0.913612828461539

01:05:29.160 --> 01:05:30.880 B 103 trained cells, right?

NOTE Confidence: 0.913612828461539

01:05:30.880 --> 01:05:32.880 And I'm going to zoom in a little bit closer.

NOTE Confidence: 0.913612828461539

01:05:32.880 --> 01:05:33.864 Now I'm going to start training

NOTE Confidence: 0.913612828461539

01:05:33.864 --> 01:05:34.520 ones that are real,

NOTE Confidence: 0.913612828461539

01:05:34.520 --> 01:05:35.864 and I can hold down the control

NOTE Confidence: 0.913612828461539

01:05:35.864 --> 01:05:36.440 button as well.

NOTE Confidence: 0.913612828461539

01:05:36.440 --> 01:05:37.958 Select these guys that are real,

NOTE Confidence: 0.913612828461539

01:05:37.960 --> 01:05:39.892 select all the guys that I think

NOTE Confidence: 0.913612828461539

01:05:39.892 --> 01:05:41.959 are real cells that I want to keep.

NOTE Confidence: 0.913612828461539

01:05:41.960 --> 01:05:42.880 Put those into Class A,

NOTE Confidence: 0.913612828461539

01:05:42.880 --> 01:05:43.132 right?

NOTE Confidence: 0.913612828461539

01:05:43.132 --> 01:05:44.644 And you're going to go through

NOTE Confidence: 0.913612828461539

01:05:44.644 --> 01:05:46.310 and you're going to train as many

NOTE Confidence: 0.913612828461539

01:05:46.310 --> 01:05:47.600 of these as you possibly can.

NOTE Confidence: 0.913612828461539

01:05:47.600 --> 01:05:49.760 The nice thing about this machine

NOTE Confidence: 0.913612828461539

01:05:49.760 --> 01:05:51.158 learning in any of the machine learning,

NOTE Confidence: 0.913612828461539

01:05:51.160 --> 01:05:52.276 I didn't talk about this before,

NOTE Confidence: 0.913612828461539

01:05:52.280 --> 01:05:53.882 but any of the machine learning

NOTE Confidence: 0.913612828461539

01:05:53.882 --> 01:05:55.278 and the surface creations that

NOTE Confidence: 0.913612828461539

01:05:55.278 --> 01:05:57.232 we've created in the earlier part

NOTE Confidence: 0.913612828461539

01:05:57.232 --> 01:05:58.276 of the presentation,

NOTE Confidence: 0.913612828461539

01:05:58.280 --> 01:06:00.176 you can save those parameters and

NOTE Confidence: 0.913612828461539

01:06:00.176 --> 01:06:02.478 you can apply them to other images.

NOTE Confidence: 0.913612828461539

01:06:02.480 --> 01:06:03.203 So for example,

NOTE Confidence: 0.913612828461539

01:06:03.203 --> 01:06:04.408 that machine learning that I

NOTE Confidence: 0.913612828461539

01:06:04.408 --> 01:06:06.079 did on that Microglia data set,

NOTE Confidence: 0.913612828461539

01:06:06.080 --> 01:06:08.141 I can save those parameters from

NOTE Confidence: 0.913612828461539

01:06:08.141 --> 01:06:09.688 that training and I can apply them

NOTE Confidence: 0.913612828461539

01:06:09.688 --> 01:06:11.482 to an identical a similar data set

NOTE Confidence: 0.913612828461539

01:06:11.482 --> 01:06:13.279 that was required in the same way,

NOTE Confidence: 0.913612828461539

01:06:13.280 --> 01:06:13.812 same quality,

NOTE Confidence: 0.913612828461539

01:06:13.812 --> 01:06:15.940 and I can apply the exact same pixel

NOTE Confidence: 0.913612828461539

01:06:16.000 --> 01:06:18.400 classification to those particular data sets.

NOTE Confidence: 0.913612828461539

01:06:18.400 --> 01:06:19.108 Same thing here.

NOTE Confidence: 0.913612828461539

01:06:19.108 --> 01:06:21.026 As soon as I train these data sets

NOTE Confidence: 0.913612828461539

01:06:21.026 --> 01:06:22.531 and I say you know what these

NOTE Confidence: 0.913612828461539

01:06:22.531 --> 01:06:24.247 are all these are all the cells

NOTE Confidence: 0.913612828461539

01:06:24.247 --> 01:06:25.477 that I want to identify.

NOTE Confidence: 0.698224241428571

01:06:27.720 --> 01:06:30.996 When I save this spots current parameter,

NOTE Confidence: 0.698224241428571

01:06:31.000 --> 01:06:33.720 this training that I give will be identified.

NOTE Confidence: 0.698224241428571

01:06:33.720 --> 01:06:35.440 So all these guys here on those lines,

NOTE Confidence: 0.698224241428571

01:06:35.440 --> 01:06:36.480 those are all background.

NOTE Confidence: 0.698224241428571

01:06:36.480 --> 01:06:38.040 Make sure we choose those background.

NOTE Confidence: 0.698224241428571

01:06:38.040 --> 01:06:40.842 These guys are background and again you're

NOTE Confidence: 0.698224241428571

01:06:40.842 --> 01:06:42.730 going to try to get as many of these

NOTE Confidence: 0.698224241428571

01:06:42.730 --> 01:06:44.594 guys as you possibly can that are real,

NOTE Confidence: 0.698224241428571

01:06:44.600 --> 01:06:45.998 these guys that are not real.

NOTE Confidence: 0.698224241428571

01:06:46.000 --> 01:06:47.575 And again, usually I'm going to train

NOTE Confidence: 0.698224241428571

01:06:47.575 --> 01:06:49.199 a little bit more than this year,

NOTE Confidence: 0.698224241428571

01:06:49.200 --> 01:06:52.208 but the idea is that hit train and predict,

NOTE Confidence: 0.698224241428571

01:06:52.208 --> 01:06:53.600 you're going to start seeing all

NOTE Confidence: 0.698224241428571

01:06:53.643 --> 01:06:55.227 those guys are going to turn red and

NOTE Confidence: 0.698224241428571

01:06:55.227 --> 01:06:56.678 those guys are going to turn green.

NOTE Confidence: 0.698224241428571

01:06:56.680 --> 01:06:58.392 Now this isn't a once and done deal, right?

NOTE Confidence: 0.698224241428571

01:06:58.392 --> 01:06:59.900 You can say, hey, you know what,

NOTE Confidence: 0.698224241428571

01:06:59.900 --> 01:07:00.800 that's a cell.

NOTE Confidence: 0.698224241428571

01:07:00.800 --> 01:07:02.798 I want to keep that guy that's a cell,

NOTE Confidence: 0.698224241428571

01:07:02.800 --> 01:07:04.195 put it in that, put it in that category,

NOTE Confidence: 0.698224241428571

01:07:04.200 --> 01:07:05.372 train and predict again.

NOTE Confidence: 0.698224241428571

01:07:05.372 --> 01:07:07.130 And it's going to hopefully chain

NOTE Confidence: 0.698224241428571

01:07:07.189 --> 01:07:08.757 chain the categories elsewhere.

NOTE Confidence: 0.698224241428571

01:07:08.760 --> 01:07:09.208 And again,

NOTE Confidence: 0.698224241428571

01:07:09.208 --> 01:07:10.776 you just kind of look through your

NOTE Confidence: 0.698224241428571

01:07:10.776 --> 01:07:12.397 data set and do the best training

NOTE Confidence: 0.698224241428571

01:07:12.397 --> 01:07:13.732 that you possibly can to identify

NOTE Confidence: 0.698224241428571

01:07:13.732 --> 01:07:15.620 what is a cell and what's not a cell.

NOTE Confidence: 0.698224241428571

01:07:15.620 --> 01:07:17.320 Again, the more you train,

NOTE Confidence: 0.698224241428571

01:07:17.320 --> 01:07:18.118 the better it's going to bet.

NOTE Confidence: 0.698224241428571

01:07:18.120 --> 01:07:20.168 And you can see it's doing a pretty

NOTE Confidence: 0.698224241428571

01:07:20.168 --> 01:07:21.923 pretty decent job of identifying find

NOTE Confidence: 0.698224241428571

01:07:21.923 --> 01:07:24.308 these guys that are real cell bodies that

NOTE Confidence: 0.698224241428571

01:07:24.308 --> 01:07:26.678 are in focus that I want to include.

NOTE Confidence: 0.698224241428571

01:07:26.680 --> 01:07:28.600 And so the idea is that now I have these

NOTE Confidence: 0.698224241428571

01:07:28.648 --> 01:07:30.280 training data sets and hit finish.

NOTE Confidence: 0.698224241428571

01:07:30.280 --> 01:07:32.408 When I get the labels here I can

NOTE Confidence: 0.698224241428571

01:07:32.408 --> 01:07:34.440 see my labels there are set.

NOTE Confidence: 0.698224241428571

01:07:34.440 --> 01:07:36.150 This is set number two of the ones I

NOTE Confidence: 0.698224241428571

01:07:36.150 --> 01:07:42.440 did here I have 215, good ones 12151.

NOTE Confidence: 0.698224241428571

01:07:42.440 --> 01:07:44.420 And So what we ended up doing in this

NOTE Confidence: 0.698224241428571

01:07:44.420 --> 01:07:46.076 particular instance is I did it for all

NOTE Confidence: 0.698224241428571

01:07:46.076 --> 01:07:48.916 three Red, green and blue come down here.

NOTE Confidence: 0.698224241428571

01:07:48.920 --> 01:07:51.107 And the idea is that I made a separate

NOTE Confidence: 0.698224241428571

01:07:51.107 --> 01:07:52.958 group here of the classifications.

NOTE Confidence: 0.698224241428571

01:07:52.960 --> 01:07:54.946 So these are my red, my Blues,

NOTE Confidence: 0.698224241428571

01:07:54.946 --> 01:07:56.198 my Reds, my green.

NOTE Confidence: 0.698224241428571

01:07:56.200 --> 01:07:57.200 And then I did that.

NOTE Confidence: 0.698224241428571

01:07:57.200 --> 01:07:58.640 I just did the triple Colo.

NOTE Confidence: 0.698224241428571

01:07:58.640 --> 01:08:01.320 So here's here are triple Colo green cells.

NOTE Confidence: 0.698224241428571

01:08:01.320 --> 01:08:02.538 So if I go back here and

NOTE Confidence: 0.698224241428571

01:08:02.538 --> 01:08:03.680 I look at these guys,

NOTE Confidence: 0.698224241428571

01:08:03.680 --> 01:08:07.668 these guys here are triple Colo green cells,

NOTE Confidence: 0.698224241428571

01:08:07.668 --> 01:08:08.376 that guy.

NOTE Confidence: 0.698224241428571

01:08:08.376 --> 01:08:11.234 And if I turn on my red and

NOTE Confidence: 0.698224241428571

01:08:11.234 --> 01:08:13.818 I turn on my my blue, right,

NOTE Confidence: 0.698224241428571

01:08:13.818 --> 01:08:15.344 You can see that there's a spot

NOTE Confidence: 0.698224241428571

01:08:15.344 --> 01:08:16.768 on each one of them, right?

NOTE Confidence: 0.698224241428571

01:08:16.768 --> 01:08:18.240 That's a triple colloquized.

NOTE Confidence: 0.698224241428571

01:08:18.240 --> 01:08:19.720 You have double colloquized

NOTE Confidence: 0.698224241428571

01:08:19.720 --> 01:08:21.200 ones here as well.

NOTE Confidence: 0.698224241428571

01:08:21.200 --> 01:08:22.360 You have single red cells.

NOTE Confidence: 0.698224241428571

01:08:22.360 --> 01:08:23.600 You have single blue cells.

NOTE Confidence: 0.698224241428571

01:08:23.600 --> 01:08:24.960 You have single green cells.

NOTE Confidence: 0.698224241428571

01:08:24.960 --> 01:08:26.904 You have all these structures here

NOTE Confidence: 0.698224241428571

01:08:26.904 --> 01:08:29.080 you have for your segmentation,

NOTE Confidence: 0.698224241428571

01:08:29.080 --> 01:08:31.236 you have the the way of identifying

NOTE Confidence: 0.698224241428571

01:08:31.236 --> 01:08:33.518 whether or not they're they're like,

NOTE Confidence: 0.698224241428571

01:08:33.520 --> 01:08:36.634 here's there's blue and pink or blue and red,

NOTE Confidence: 0.698224241428571

01:08:36.640 --> 01:08:37.918 blue and red double labeled cells,

NOTE Confidence: 0.698224241428571

01:08:37.920 --> 01:08:39.216 not green labeled, right.

NOTE Confidence: 0.698224241428571

01:08:39.216 --> 01:08:40.836 There's another triple labeled cell.

NOTE Confidence: 0.698224241428571

01:08:40.840 --> 01:08:41.806 And so there's a lot of

NOTE Confidence: 0.698224241428571

01:08:41.806 --> 01:08:42.600 different ways to do it.

NOTE Confidence: 0.698224241428571

01:08:42.600 --> 01:08:44.035 But that machine learning is a really,

NOTE Confidence: 0.698224241428571

01:08:44.040 --> 01:08:47.676 really nice trick to help remove

NOTE Confidence: 0.698224241428571

01:08:47.680 --> 01:08:50.640 kind of incorrectly placed spots.

NOTE Confidence: 0.852745664

01:08:50.640 --> 01:08:52.200 Or surfaces for that matter,

NOTE Confidence: 0.852745664

01:08:52.200 --> 01:08:53.760 does the same thing with surfaces.

NOTE Confidence: 0.852745664

01:08:53.760 --> 01:08:54.936 This happens maybe if you have

NOTE Confidence: 0.852745664

01:08:54.936 --> 01:08:56.259 a lot of noise or background

NOTE Confidence: 0.852745664

01:08:56.259 --> 01:08:57.474 and and things like that.

NOTE Confidence: 0.887089883333333

01:09:00.160 --> 01:09:04.320 OK, so gosh, what time is it

NOTE Confidence: 0.810002466666667

01:09:06.800 --> 01:09:08.000 10:45? OK, so

NOTE Confidence: 0.891546680588235

01:09:10.560 --> 01:09:13.008 I'm getting to the end of kind of the

NOTE Confidence: 0.891546680588235

01:09:13.008 --> 01:09:15.678 main things that I wanted to cover today,

NOTE Confidence: 0.891546680588235

01:09:15.680 --> 01:09:18.208 some of the things that we didn't cover

NOTE Confidence: 0.891546680588235

01:09:18.208 --> 01:09:20.525 that are still of interest to a lot

NOTE Confidence: 0.891546680588235

01:09:20.525 --> 01:09:22.400 of people is tracking, self tracking.

NOTE Confidence: 0.894514795

01:09:24.480 --> 01:09:26.640 If you have a time lapse data set,

NOTE Confidence: 0.894514795

01:09:26.640 --> 01:09:28.104 all of the surface rendering that

NOTE Confidence: 0.894514795

01:09:28.104 --> 01:09:30.238 we've done so far, the spot creation,

NOTE Confidence: 0.894514795

01:09:30.238 --> 01:09:31.396 the surface creation,

NOTE Confidence: 0.894514795

01:09:31.400 --> 01:09:33.140 everything that we've done can be

NOTE Confidence: 0.894514795

01:09:33.140 --> 01:09:35.330 applied in a time lapse and used

NOTE Confidence: 0.894514795

01:09:35.330 --> 01:09:36.950 our tracking algorithm to that

NOTE Confidence: 0.894514795

01:09:36.950 --> 01:09:38.679 track those objects over time.

NOTE Confidence: 0.894514795

01:09:38.680 --> 01:09:40.904 So the better you can, again it goes,

NOTE Confidence: 0.894514795

01:09:40.904 --> 01:09:42.872 always goes back to acquisition time,

NOTE Confidence: 0.894514795

01:09:42.880 --> 01:09:44.160 resolution, those sorts of things.

NOTE Confidence: 0.894514795

01:09:44.160 --> 01:09:46.477 The better you can acquire your data,

NOTE Confidence: 0.894514795

01:09:46.480 --> 01:09:48.720 the better you can render individual cells,

NOTE Confidence: 0.894514795

01:09:48.720 --> 01:09:50.262 whether it be a spot object

NOTE Confidence: 0.894514795

01:09:50.262 --> 01:09:51.033 or surface object,

NOTE Confidence: 0.894514795

01:09:51.040 --> 01:09:52.315 the better the tracking algorithm

NOTE Confidence: 0.894514795

01:09:52.315 --> 01:09:53.880 is going to work as well.

NOTE Confidence: 0.894514795

01:09:53.880 --> 01:09:55.270 And again, tracking just real

NOTE Confidence: 0.894514795

01:09:55.270 --> 01:09:56.960 quick what that looks like here.

NOTE Confidence: 0.894514795

01:09:56.960 --> 01:09:59.536 If I open up a demo data set,

NOTE Confidence: 0.894514795

01:09:59.536 --> 01:10:01.640 let me see if I have one,

NOTE Confidence: 0.89762452

01:10:07.080 --> 01:10:08.038 I can do this one. Sure.

NOTE Confidence: 0.89762452

01:10:08.038 --> 01:10:10.800 This is a little bit of a unique data set

NOTE Confidence: 0.89762452

01:10:10.800 --> 01:10:12.375 where I actually use the machine learning

NOTE Confidence: 0.89762452

01:10:12.375 --> 01:10:14.199 to clean up the data set a little bit.

NOTE Confidence: 0.89762452

01:10:14.200 --> 01:10:17.662 So for example, the raw data

NOTE Confidence: 0.89762452

01:10:17.662 --> 01:10:19.704 looks like this, right?

NOTE Confidence: 0.89762452

01:10:19.704 --> 01:10:22.440 So this is not a very clean data set.

NOTE Confidence: 0.89762452

01:10:22.440 --> 01:10:23.664 The customer allowed me to share

NOTE Confidence: 0.89762452

01:10:23.664 --> 01:10:25.120 this data set because I thought it

NOTE Confidence: 0.89762452

01:10:25.120 --> 01:10:25.920 was kind of interesting.

NOTE Confidence: 0.89762452

01:10:25.920 --> 01:10:28.800 But this is I think a blood vessel and

NOTE Confidence: 0.89762452

01:10:28.800 --> 01:10:32.156 there's cells going through this vessel here.

NOTE Confidence: 0.89762452

01:10:32.160 --> 01:10:34.710 And so in time, you can kind of see these

NOTE Confidence: 0.89762452

01:10:34.773 --> 01:10:36.832 guys kind of moving along in space.

NOTE Confidence: 0.89762452

01:10:36.832 --> 01:10:39.440 Now the time resolution here isn't fantastic,

NOTE Confidence: 0.89762452

01:10:39.440 --> 01:10:41.132 but you can see there's a lot of signal

NOTE Confidence: 0.89762452

01:10:41.132 --> 01:10:42.717 in there that are clearly signal,

NOTE Confidence: 0.89762452

01:10:42.720 --> 01:10:45.280 but there's also a lot of garbage and

NOTE Confidence: 0.89762452

01:10:45.280 --> 01:10:47.048 other stuff floating around in here.

NOTE Confidence: 0.89762452

01:10:47.048 --> 01:10:49.368 So what I ended up doing in this

NOTE Confidence: 0.89762452

01:10:49.368 --> 01:10:51.342 particular instance is I was able to

NOTE Confidence: 0.89762452

01:10:51.342 --> 01:10:53.355 kind of detect all the cells here.

NOTE Confidence: 0.89762452

01:10:53.360 --> 01:10:55.736 I did the blue cells with the machine

NOTE Confidence: 0.89762452

01:10:55.736 --> 01:10:57.055 learning and identified the cells as

NOTE Confidence: 0.89762452

01:10:57.055 --> 01:10:58.784 well as a lot of different background

NOTE Confidence: 0.89762452

01:10:58.784 --> 01:11:00.434 and noise structures as well.

NOTE Confidence: 0.89762452

01:11:00.440 --> 01:11:02.520 But with a little bit of machine learning,

NOTE Confidence: 0.89762452

01:11:02.520 --> 01:11:05.160 it was able to detect most of not all of,

NOTE Confidence: 0.89762452

01:11:05.160 --> 01:11:06.696 but most of the cells that are moving

NOTE Confidence: 0.89762452

01:11:06.696 --> 01:11:08.163 through the vessel and all the ones that

NOTE Confidence: 0.89762452

01:11:08.163 --> 01:11:09.678 are on the edge of the vessels here,

NOTE Confidence: 0.89762452

01:11:09.680 --> 01:11:10.526 these pink guys,

NOTE Confidence: 0.89762452

01:11:10.526 --> 01:11:12.841 it was able to kind of identify those

NOTE Confidence: 0.89762452

01:11:12.841 --> 01:11:14.625 as not really objects of interest.

NOTE Confidence: 0.89762452

01:11:14.625 --> 01:11:17.276 And so I was able to kind of

NOTE Confidence: 0.89762452

01:11:17.276 --> 01:11:19.129 isolate those blue cells blue,

NOTE Confidence: 0.89762452

01:11:19.129 --> 01:11:20.236 duplicate them out,

NOTE Confidence: 0.89762452

01:11:20.236 --> 01:11:22.081 get them outside by themselves

NOTE Confidence: 0.89762452

01:11:22.081 --> 01:11:24.383 here and then build the tracking

NOTE Confidence: 0.89762452

01:11:24.383 --> 01:11:25.800 algorithm just on those blue cells.

NOTE Confidence: 0.89762452

01:11:25.800 --> 01:11:27.240 Now I'm not detecting them separately,

NOTE Confidence: 0.89762452

01:11:27.240 --> 01:11:28.024 so I just go,

NOTE Confidence: 0.89762452

01:11:28.024 --> 01:11:29.725 I jump right into the wizard here and

NOTE Confidence: 0.89762452

01:11:29.725 --> 01:11:31.406 jump right to the tracking step, right.

NOTE Confidence: 0.89762452

01:11:31.406 --> 01:11:32.636 And in the tracking step,

NOTE Confidence: 0.89762452

01:11:32.640 --> 01:11:34.075 you have a couple different options here.

NOTE Confidence: 0.89762452

01:11:34.080 --> 01:11:35.784 There's some autoregressive motion,

NOTE Confidence: 0.89762452

01:11:35.784 --> 01:11:36.636 Browning motion.

NOTE Confidence: 0.89762452

01:11:36.640 --> 01:11:38.800 Those are the two big ones in terms

NOTE Confidence: 0.89762452

01:11:38.800 --> 01:11:40.623 of movement algorithms that we have

NOTE Confidence: 0.89762452

01:11:40.623 --> 01:11:42.800 to kind of trace objects over time.

NOTE Confidence: 0.89762452

01:11:42.800 --> 01:11:44.760 There is a lineage algorithm as well.

NOTE Confidence: 0.89762452

01:11:44.760 --> 01:11:45.840 This looks for branching.

NOTE Confidence: 0.89762452

01:11:45.840 --> 01:11:48.000 So if you were doing cell division,

NOTE Confidence: 0.89762452

01:11:48.000 --> 01:11:48.296 Embryology,

NOTE Confidence: 0.89762452

01:11:48.296 --> 01:11:49.480 those sorts of things,

NOTE Confidence: 0.89762452

01:11:49.480 --> 01:11:51.608 and you had a decent enough time resolution

NOTE Confidence: 0.89762452

01:11:51.608 --> 01:11:53.788 to kind of watch cells divide and try

NOTE Confidence: 0.89762452

01:11:53.788 --> 01:11:56.000 to find their pattern or their generations,

NOTE Confidence: 0.89762452

01:11:56.000 --> 01:11:58.317 then this lineage algorithm will try to,

NOTE Confidence: 0.89762452

01:11:58.320 --> 01:11:58.905 if it's present,

NOTE Confidence: 0.89762452

01:11:58.905 --> 01:12:00.270 and if it can try to detect

NOTE Confidence: 0.89762452

01:12:00.323 --> 01:12:01.478 it based on the algorithm,

NOTE Confidence: 0.89762452

01:12:01.480 --> 01:12:02.790 it'll try to detect when

NOTE Confidence: 0.89762452

01:12:02.790 --> 01:12:03.838 there's a splitting cell,

NOTE Confidence: 0.89762452

01:12:03.840 --> 01:12:06.200 a dividing cell into two.

NOTE Confidence: 0.89762452

01:12:06.200 --> 01:12:07.000 And it works pretty good.

NOTE Confidence: 0.89762452

01:12:07.000 --> 01:12:08.834 Again, as long as you have good

NOTE Confidence: 0.89762452

01:12:08.834 --> 01:12:10.040 enough clear enough signal,

NOTE Confidence: 0.89762452

01:12:10.040 --> 01:12:11.643 good enough time resolution so that you

NOTE Confidence: 0.89762452

01:12:11.643 --> 01:12:13.278 can actually see it actually splitting,

NOTE Confidence: 0.89762452

01:12:13.280 --> 01:12:14.456 it works really,

NOTE Confidence: 0.89762452

01:12:14.456 --> 01:12:15.240 really well.

NOTE Confidence: 0.89762452

01:12:15.240 --> 01:12:16.276 But in this case,

NOTE Confidence: 0.89762452

01:12:16.276 --> 01:12:17.830 we're going to use probably autoregressive

NOTE Confidence: 0.89762452

01:12:17.877 --> 01:12:19.877 motion which kind of looks for kind of

NOTE Confidence: 0.89762452

01:12:19.877 --> 01:12:21.118 predictive patterns and the pathway,

NOTE Confidence: 0.89762452

01:12:21.120 --> 01:12:21.934 these fibers,

NOTE Confidence: 0.89762452

01:12:21.934 --> 01:12:24.376 these cells rather moving in One

NOTE Confidence: 0.89762452

01:12:24.376 --> 01:12:26.200 Direction from left to right,

NOTE Confidence: 0.89762452

01:12:26.200 --> 01:12:26.472 you know,

NOTE Confidence: 0.89762452

01:12:26.472 --> 01:12:26.880 and you can,

NOTE Confidence: 0.89762452

01:12:26.880 --> 01:12:27.692 you can track these

NOTE Confidence: 0.89762452

01:12:27.692 --> 01:12:28.910 objects and you can see the

NOTE Confidence: 0.925303626470588

01:12:28.962 --> 01:12:30.474 tracks of some of the objects here.

NOTE Confidence: 0.925303626470588

01:12:30.480 --> 01:12:32.559 And again, it's not tracking him 100%

NOTE Confidence: 0.925303626470588

01:12:32.560 --> 01:12:34.296 perfectly, but it's tracking a lot of

NOTE Confidence: 0.925303626470588

01:12:34.296 --> 01:12:36.052 these guys fine for a couple different

NOTE Confidence: 0.925303626470588

01:12:36.052 --> 01:12:37.959 time points until it kind of loses it.

NOTE Confidence: 0.925303626470588

01:12:37.960 --> 01:12:39.120 Like this guy right here,

NOTE Confidence: 0.925303626470588

01:12:39.120 --> 01:12:40.240 if I go up and back and forth,

NOTE Confidence: 0.925303626470588

01:12:40.240 --> 01:12:41.370 you can see it's tracking

NOTE Confidence: 0.925303626470588

01:12:41.370 --> 01:12:42.274 that guy pretty nicely.

NOTE Confidence: 0.925303626470588

01:12:42.280 --> 01:12:44.320 So it kind of appears out of nowhere,

NOTE Confidence: 0.925303626470588

01:12:44.320 --> 01:12:45.252 tracks it, tracks it,

NOTE Confidence: 0.925303626470588

01:12:45.252 --> 01:12:46.940 tracks it, tracks it, tracks it.

NOTE Confidence: 0.925303626470588

01:12:46.940 --> 01:12:48.796 And then maybe it events where he

NOTE Confidence: 0.925303626470588

01:12:48.796 --> 01:12:50.506 kind of loses it because now it's not

NOTE Confidence: 0.925303626470588

01:12:50.506 --> 01:12:51.838 100% sure if that's the same guy.

NOTE Confidence: 0.925303626470588

01:12:51.840 --> 01:12:53.568 So it stops that track and then it moves

NOTE Confidence: 0.925303626470588

01:12:53.568 --> 01:12:55.677 on to get another track and track these guys.

NOTE Confidence: 0.925303626470588

01:12:55.680 --> 01:12:58.352 And so from from the data here that

NOTE Confidence: 0.925303626470588

01:12:58.352 --> 01:13:01.440 you get from from tracking these guys,

NOTE Confidence: 0.925303626470588

01:13:01.440 --> 01:13:04.505 you have a whole slew of new statistics spot.

NOTE Confidence: 0.925303626470588

01:13:04.505 --> 01:13:04.890 Oops.

NOTE Confidence: 0.925303626470588

01:13:04.890 --> 01:13:09.600 Oh, that track crashed on me Live demo.

NOTE Confidence: 0.925303626470588

01:13:09.600 --> 01:13:11.040 We have a lot of different

NOTE Confidence: 0.919215012

01:13:13.080 --> 01:13:16.800 ways of exporting that data,

NOTE Confidence: 0.919215012

01:13:16.800 --> 01:13:19.518 different tracking statistics,

NOTE Confidence: 0.919215012

01:13:19.520 --> 01:13:21.066 instantaneous speeds.

NOTE Confidence: 0.919215012

01:13:21.066 --> 01:13:25.030 You have individual object tracks here.

NOTE Confidence: 0.919215012

01:13:25.030 --> 01:13:27.960 Let's put this back up here in here

NOTE Confidence: 0.868243378333333

01:13:31.680 --> 01:13:33.480 again, whole different set of statistics.

NOTE Confidence: 0.868243378333333

01:13:33.480 --> 01:13:34.957 But now you have some tracking data.

NOTE Confidence: 0.868243378333333

01:13:34.960 --> 01:13:36.880 So if I look at, for example,

NOTE Confidence: 0.961066996

01:13:39.760 --> 01:13:42.627 let's just look at speed, right.

NOTE Confidence: 0.961066996

01:13:42.627 --> 01:13:44.670 So if I check an object that I'm tracking

NOTE Confidence: 0.961066996

01:13:44.720 --> 01:13:46.520 that has speed check on this guy here.

NOTE Confidence: 0.961066996

01:13:46.520 --> 01:13:47.892 Now a lot of these guys aren't

NOTE Confidence: 0.961066996

01:13:47.892 --> 01:13:48.720 tracks super duper long,

NOTE Confidence: 0.961066996

01:13:48.720 --> 01:13:50.238 so the tracks are really small,

NOTE Confidence: 0.961066996

01:13:50.240 --> 01:13:53.360 but you can get instantaneous tracking.

NOTE Confidence: 0.961066996

01:13:53.360 --> 01:13:54.480 You know, just looking at the graph here,

NOTE Confidence: 0.961066996

01:13:54.480 --> 01:13:55.908 this orange is representing the track

NOTE Confidence: 0.961066996

01:13:55.908 --> 01:13:57.359 that I have selected right here.

NOTE Confidence: 0.961066996

01:13:57.360 --> 01:13:58.580 I can select another guy

NOTE Confidence: 0.961066996

01:13:58.580 --> 01:13:59.556 here that's there too.

NOTE Confidence: 0.961066996

01:13:59.560 --> 01:14:01.254 But the idea is that you can

NOTE Confidence: 0.961066996

01:14:01.254 --> 01:14:02.719 get that tracking data out say,

NOTE Confidence: 0.961066996

01:14:02.720 --> 01:14:04.184 hey, that that's the speed at

NOTE Confidence: 0.961066996

01:14:04.184 --> 01:14:05.160 that particular time point.

NOTE Confidence: 0.961066996

01:14:05.160 --> 01:14:06.984 As I move through time and

NOTE Confidence: 0.961066996

01:14:06.984 --> 01:14:08.200 export this data out,

NOTE Confidence: 0.961066996

01:14:08.200 --> 01:14:10.243 I'll get the data you know on a per

NOTE Confidence: 0.961066996

01:14:10.243 --> 01:14:11.988 object per track basis and be able

NOTE Confidence: 0.961066996

01:14:11.988 --> 01:14:14.146 to kind of export that into an Excel

NOTE Confidence: 0.961066996

01:14:14.146 --> 01:14:16.168 document and get get the tracking of

NOTE Confidence: 0.961066996

01:14:16.168 --> 01:14:18.864 these objects over time within the data set.

NOTE Confidence: 0.961066996

01:14:18.864 --> 01:14:20.972 Now a little bit better data set

NOTE Confidence: 0.961066996

01:14:20.972 --> 01:14:22.274 to kind of show that real quick.

NOTE Confidence: 0.961066996

01:14:22.280 --> 01:14:24.359 So demo another demo data set here.

NOTE Confidence: 0.961066996

01:14:24.360 --> 01:14:26.888 This is kind of really not a very

NOTE Confidence: 0.961066996

01:14:26.888 --> 01:14:29.320 great data set, but it's just a,

NOTE Confidence: 0.961066996

01:14:29.320 --> 01:14:31.120 it's an R18 demo here.

NOTE Confidence: 0.961066996

01:14:31.120 --> 01:14:32.545 The resolution in this one

NOTE Confidence: 0.961066996

01:14:32.545 --> 01:14:33.400 is really terrible.

NOTE Confidence: 0.961066996

01:14:33.400 --> 01:14:36.280 It's a really low resolution XY data set,

NOTE Confidence: 0.961066996

01:14:36.280 --> 01:14:38.760 but probably acquired really quickly.

NOTE Confidence: 0.961066996

01:14:38.760 --> 01:14:40.640 But the idea is that we can come up here,

NOTE Confidence: 0.961066996

01:14:40.640 --> 01:14:42.590 we don't need to classify

NOTE Confidence: 0.961066996

01:14:42.590 --> 01:14:43.760 this particular object.

NOTE Confidence: 0.961066996

01:14:43.760 --> 01:14:44.190 Spot detection,

NOTE Confidence: 0.961066996

01:14:44.190 --> 01:14:45.910 you can see it does a pretty good

NOTE Confidence: 0.961066996

01:14:45.958 --> 01:14:47.320 job of detecting all the spots.

NOTE Confidence: 0.961066996

01:14:47.320 --> 01:14:48.420 You can adjust thresholds,

NOTE Confidence: 0.961066996

01:14:48.420 --> 01:14:50.633 whatever it needs to be to kind of

NOTE Confidence: 0.961066996

01:14:50.633 --> 01:14:53.680 detect all the spots, come here,

NOTE Confidence: 0.961066996

01:14:53.680 --> 01:14:55.576 do the algorithm and you get

NOTE Confidence: 0.961066996

01:14:55.576 --> 01:14:56.840 your tracks over time.

NOTE Confidence: 0.961066996

01:14:56.840 --> 01:14:58.688 So now you can kind of see

NOTE Confidence: 0.961066996

01:14:58.688 --> 01:15:00.290 these guys tracking over time.

NOTE Confidence: 0.961066996

01:15:00.290 --> 01:15:03.125 If you click on one of these

NOTE Confidence: 0.961066996

01:15:03.125 --> 01:15:05.716 guys here and we focus it on it,

NOTE Confidence: 0.961066996

01:15:05.720 --> 01:15:06.151 right,

NOTE Confidence: 0.961066996

01:15:06.151 --> 01:15:08.737 he can see that guy tracking

NOTE Confidence: 0.961066996

01:15:08.737 --> 01:15:10.040 and moving through time,

NOTE Confidence: 0.91544459

01:15:12.120 --> 01:15:14.388 right? And then when you look at

NOTE Confidence: 0.91544459

01:15:14.388 --> 01:15:16.204 the statistics, you have all those

NOTE Confidence: 0.91544459

01:15:16.204 --> 01:15:17.659 statistics that are available for

NOTE Confidence: 0.91544459

01:15:17.659 --> 01:15:18.958 tracking that particular guy,

NOTE Confidence: 0.91544459

01:15:18.960 --> 01:15:21.039 whether it's looking at speed or anything,

NOTE Confidence: 0.91544459

01:15:21.040 --> 01:15:22.632 you can see the change in speed over

NOTE Confidence: 0.91544459

01:15:22.632 --> 01:15:24.520 time of that particular object. Visually,

NOTE Confidence: 0.91544459

01:15:24.520 --> 01:15:28.120 we can make this a little bit more pretty.

NOTE Confidence: 0.91544459

01:15:28.120 --> 01:15:28.760 You can come up here,

NOTE Confidence: 0.91544459

01:15:28.760 --> 01:15:30.120 You can do what's called the Dragon Tail.

NOTE Confidence: 0.91544459

01:15:30.120 --> 01:15:31.436 So I'm going to show a couple

NOTE Confidence: 0.91544459

01:15:31.436 --> 01:15:32.520 of time points at the end.

NOTE Confidence: 0.91544459

01:15:32.520 --> 01:15:34.360 So you kind of just see the the tail end

NOTE Confidence: 0.91544459

01:15:34.414 --> 01:15:36.394 of it as it's going for longer time lapses.

NOTE Confidence: 0.91544459

01:15:36.400 --> 01:15:37.834 This makes it really nice to

NOTE Confidence: 0.91544459

01:15:37.834 --> 01:15:39.319 kind of visualize the data sets.

NOTE Confidence: 0.91544459

01:15:39.320 --> 01:15:40.946 There's a lot of other visualization

NOTE Confidence: 0.91544459

01:15:40.946 --> 01:15:41.759 tools with tracks.

NOTE Confidence: 0.91544459

01:15:41.760 --> 01:15:43.044 Again, if you're doing any tracking

NOTE Confidence: 0.91544459

01:15:43.044 --> 01:15:44.718 data sets and you have any questions,

NOTE Confidence: 0.91544459

01:15:44.720 --> 01:15:47.204 set up a time we can talk about the

NOTE Confidence: 0.91544459

01:15:47.204 --> 01:15:49.399 different ways of of quantifying the data,

NOTE Confidence: 0.91544459

01:15:49.399 --> 01:15:50.638 visualizing the data,

NOTE Confidence: 0.91544459

01:15:50.640 --> 01:15:52.635 plotting the data, that sort of thing.

NOTE Confidence: 0.91544459

01:15:52.640 --> 01:15:53.648 We don't have a whole lot of

NOTE Confidence: 0.91544459

01:15:53.648 --> 01:15:54.399 plotting tools in the Mars.

NOTE Confidence: 0.91544459

01:15:54.400 --> 01:15:56.480 There's a Vantage tool here.

NOTE Confidence: 0.91544459

01:15:56.480 --> 01:15:59.528 Vantage tool is a nice little

NOTE Confidence: 0.91544459

01:15:59.528 --> 01:16:02.248 tool to render objects and make.

NOTE Confidence: 0.91544459

01:16:02.248 --> 01:16:03.280 I like to,

NOTE Confidence: 0.91544459

01:16:03.280 --> 01:16:05.740 I like to call it like kind

NOTE Confidence: 0.91544459

01:16:05.740 --> 01:16:08.840 of a data navigation tool,

NOTE Confidence: 0.91544459

01:16:08.840 --> 01:16:10.620 looking at the statistics,

NOTE Confidence: 0.91544459

01:16:10.620 --> 01:16:12.944 plotting your statistics a lot of times.

NOTE Confidence: 0.91544459

01:16:12.944 --> 01:16:13.436 For example,

NOTE Confidence: 0.91544459

01:16:13.440 --> 01:16:15.130 let's just say we look at the CD 80 and

NOTE Confidence: 0.91544459

01:16:15.175 --> 01:16:17.039 there's a lot of different objects in here.

NOTE Confidence: 0.91544459

01:16:17.040 --> 01:16:20.046 Say we look at the CD 86 that we've

NOTE Confidence: 0.91544459

01:16:20.046 --> 01:16:21.160 segmented out and you're like,

NOTE Confidence: 0.91544459

01:16:21.160 --> 01:16:22.280 wow, that's a lot of lot of

NOTE Confidence: 0.91544459

01:16:22.323 --> 01:16:23.198 stuff going on in there.

NOTE Confidence: 0.91544459

01:16:23.200 --> 01:16:25.000 But maybe if I open up Vantage now,

NOTE Confidence: 0.91544459

01:16:25.000 --> 01:16:26.503 Vantage is going to be a little bit messy

NOTE Confidence: 0.91544459

01:16:26.503 --> 01:16:27.795 because I have a lot of objects in here.

NOTE Confidence: 0.91544459

01:16:27.800 --> 01:16:30.024 So let me just one of the drawbacks

NOTE Confidence: 0.91544459

01:16:30.024 --> 01:16:31.880 here that turns everything on.

NOTE Confidence: 0.913401869090909

01:16:34.400 --> 01:16:37.744 But if we come in here and I

NOTE Confidence: 0.913401869090909

01:16:37.744 --> 01:16:41.599 just turn on CD86 for example,

NOTE Confidence: 0.913401869090909

01:16:41.600 --> 01:16:44.192 right, this is a 1D plot for CD86,

NOTE Confidence: 0.913401869090909

01:16:44.192 --> 01:16:46.266 I can say, OK, you know,

NOTE Confidence: 0.913401869090909

01:16:46.266 --> 01:16:49.075 what is the volume like I can look at

NOTE Confidence: 0.913401869090909

01:16:49.075 --> 01:16:51.279 here and it's like there's the right,

NOTE Confidence: 0.913401869090909

01:16:51.280 --> 01:16:53.037 there's the distribution of the volume of

NOTE Confidence: 0.913401869090909

01:16:53.037 --> 01:16:54.921 all those little puncture that I created

NOTE Confidence: 0.913401869090909

01:16:54.921 --> 01:16:56.553 looking at the the volume distribution.

NOTE Confidence: 0.913401869090909

01:16:56.560 --> 01:16:57.967 So this is just a 1D plot

NOTE Confidence: 0.913401869090909

01:16:57.967 --> 01:16:59.280 of that volume distribution.

NOTE Confidence: 0.913401869090909

01:16:59.280 --> 01:17:01.160 You can choose any statistic that you want.

NOTE Confidence: 0.913401869090909

01:17:01.160 --> 01:17:02.728 You can even filter the ones that

NOTE Confidence: 0.913401869090909

01:17:02.728 --> 01:17:04.403 are small or some filter the ones

NOTE Confidence: 0.913401869090909

01:17:04.403 --> 01:17:05.831 that are bright if you want.

NOTE Confidence: 0.913401869090909

01:17:05.840 --> 01:17:08.528 So you come up here to mean intensity

NOTE Confidence: 0.913401869090909

01:17:08.528 --> 01:17:09.620 channel #1 and you could say,

NOTE Confidence: 0.913401869090909

01:17:09.620 --> 01:17:10.040 hey you know what,

NOTE Confidence: 0.913401869090909

01:17:10.040 --> 01:17:11.372 these are the only ones that are bright or

NOTE Confidence: 0.913401869090909

01:17:11.372 --> 01:17:12.836 I only want to do the ones that are dim.

NOTE Confidence: 0.913401869090909

01:17:12.840 --> 01:17:15.207 These are the guys that are dim and you

NOTE Confidence: 0.913401869090909

01:17:15.207 --> 01:17:17.595 can you can plot little graphs of these

NOTE Confidence: 0.913401869090909

01:17:17.595 --> 01:17:20.076 guys as well within kind of a 1D plot.

NOTE Confidence: 0.913401869090909

01:17:20.080 --> 01:17:22.276 You also have a 2D plot.

NOTE Confidence: 0.913401869090909

01:17:22.280 --> 01:17:25.409 2D plot gives you a little bit

NOTE Confidence: 0.913401869090909

01:17:25.409 --> 01:17:27.587 of flexibility here in terms

NOTE Confidence: 0.913401869090909

01:17:27.587 --> 01:17:29.920 of being able to plot,

NOTE Confidence: 0.913401869090909

01:17:29.920 --> 01:17:31.600 for example,

NOTE Confidence: 0.913401869090909

01:17:31.600 --> 01:17:33.360 volume versus

NOTE Confidence: 0.77111402

01:17:35.480 --> 01:17:38.120 sphericity. I don't know, right.

NOTE Confidence: 0.77111402

01:17:38.120 --> 01:17:39.794 It's just a way of looking at your data.

NOTE Confidence: 0.77111402

01:17:39.800 --> 01:17:41.620 These are those puncta that we're looking

NOTE Confidence: 0.77111402

01:17:41.620 --> 01:17:43.518 at and you can kind of distribute,

NOTE Confidence: 0.77111402

01:17:43.520 --> 01:17:45.067 you know, do any kind of graph

NOTE Confidence: 0.77111402

01:17:45.067 --> 01:17:46.240 within within the structure.

NOTE Confidence: 0.77111402

01:17:46.240 --> 01:17:47.395 The data that you're exporting

NOTE Confidence: 0.77111402

01:17:47.395 --> 01:17:48.319 is all down here.

NOTE Confidence: 0.77111402

01:17:48.320 --> 01:17:49.598 So if you did this export,

NOTE Confidence: 0.77111402

01:17:49.600 --> 01:17:51.637 you have your volume and your sphericity.

NOTE Confidence: 0.77111402

01:17:51.640 --> 01:17:53.557 If you hit this little save button on here,

NOTE Confidence: 0.77111402

01:17:53.560 --> 01:17:55.478 you'll export these guys side by side.

NOTE Confidence: 0.77111402

01:17:55.480 --> 01:17:57.377 Then you'll get the volume and the

NOTE Confidence: 0.77111402

01:17:57.377 --> 01:17:59.272 sphericity of every object that's plotted

NOTE Confidence: 0.77111402

01:17:59.272 --> 01:18:01.318 and detected within your surface scene.

NOTE Confidence: 0.77111402

01:18:01.320 --> 01:18:03.344 And again, it's just a way of navigating

NOTE Confidence: 0.77111402

01:18:03.344 --> 01:18:05.553 the data to kind of see is there a trend,

NOTE Confidence: 0.77111402

01:18:05.560 --> 01:18:07.394 trend where as the volume gets bigger,

NOTE Confidence: 0.77111402

01:18:07.400 --> 01:18:11.036 it gets more spherical or maybe it gets more,

NOTE Confidence: 0.77111402

01:18:11.040 --> 01:18:12.930 maybe the ones that are spherical

NOTE Confidence: 0.77111402

01:18:12.930 --> 01:18:14.041 or more overlapped, right.

NOTE Confidence: 0.77111402

01:18:14.041 --> 01:18:15.329 So you can look at the overlap value

NOTE Confidence: 0.77111402

01:18:15.329 --> 01:18:17.120 here and say, OK, well, there's,

NOTE Confidence: 0.77111402

01:18:17.120 --> 01:18:18.744 you know, volume versus overlap.

NOTE Confidence: 0.77111402

01:18:18.744 --> 01:18:20.232 So if it's a bigger punctum,

NOTE Confidence: 0.77111402

01:18:20.240 --> 01:18:21.300 maybe they're more overlapping,

NOTE Confidence: 0.77111402

01:18:21.300 --> 01:18:22.360 maybe they're less overlapping,

NOTE Confidence: 0.77111402

01:18:22.360 --> 01:18:23.524 maybe there's different morphology

NOTE Confidence: 0.77111402

01:18:23.524 --> 01:18:25.542 values there that we can we can

NOTE Confidence: 0.77111402

01:18:25.542 --> 01:18:27.054 look at or maybe it's look at

NOTE Confidence: 0.77111402

01:18:27.054 --> 01:18:28.480 intensity or something like that.

NOTE Confidence: 0.77111402

01:18:28.480 --> 01:18:30.307 There's a lot of different ways of

NOTE Confidence: 0.77111402

01:18:30.307 --> 01:18:32.190 looking at these data and kind of

NOTE Confidence: 0.77111402

01:18:32.190 --> 01:18:33.756 plot in these ways and structures.

NOTE Confidence: 0.77111402

01:18:33.760 --> 01:18:35.155 And then if you wanted to get really fancy,

NOTE Confidence: 0.77111402

01:18:35.160 --> 01:18:38.274 there is a 3D view of the same structure

NOTE Confidence: 0.77111402

01:18:38.280 --> 01:18:42.392 where you can plot in 3D these structures.

NOTE Confidence: 0.77111402

01:18:42.392 --> 01:18:45.620 So here you select the CD which

NOTE Confidence: 0.77111402

01:18:45.620 --> 01:18:47.720 is the surface object here,

NOTE Confidence: 0.844546859

01:18:50.520 --> 01:18:51.132 right? So again,

NOTE Confidence: 0.844546859

01:18:51.132 --> 01:18:52.560 we have all these guys turned off,

NOTE Confidence: 0.844546859

01:18:52.560 --> 01:18:55.800 so we just turn these guys off. Here.

NOTE Confidence: 0.844546859

01:18:55.800 --> 01:18:57.760 Again, I hate how it turns everything on.

NOTE Confidence: 0.844546859

01:18:57.760 --> 01:19:00.518 Makes it hard to only do one,

NOTE Confidence: 0.844546859

01:19:00.520 --> 01:19:01.960 but we just make sure.

NOTE Confidence: 0.844546859

01:19:01.960 --> 01:19:03.982 I usually don't have this many

NOTE Confidence: 0.844546859

01:19:03.982 --> 01:19:05.544 surfaces within my structure anyway.

NOTE Confidence: 0.844546859

01:19:05.544 --> 01:19:07.600 But anyway, you have this guy turned on.

NOTE Confidence: 0.844546859

01:19:07.600 --> 01:19:10.300 You go to the next step here and you can plot

NOTE Confidence: 0.844546859

01:19:10.300 --> 01:19:12.799 three statistics if you want four statistics,

NOTE Confidence: 0.844546859

01:19:12.800 --> 01:19:13.666 5 statistics.

NOTE Confidence: 0.844546859

01:19:13.666 --> 01:19:15.757 You know color coding, right?

NOTE Confidence: 0.844546859

01:19:15.757 --> 01:19:19.360 So I can do XYZ and then I can do,

NOTE Confidence: 0.844546859

01:19:19.360 --> 01:19:20.320 you know, volume.

NOTE Confidence: 0.844546859

01:19:20.320 --> 01:19:22.240 So now it's color-coded by volume,

NOTE Confidence: 0.844546859

01:19:22.240 --> 01:19:27.440 but I I can do XY or I can do surface area,

NOTE Confidence: 0.844546859

01:19:27.440 --> 01:19:29.276 whatever, and it gets really complicated.

NOTE Confidence: 0.844546859

01:19:29.280 --> 01:19:30.840 Again, I think the more complicated you get,

NOTE Confidence: 0.844546859

01:19:30.840 --> 01:19:31.928 the harder it is.

NOTE Confidence: 0.844546859

01:19:31.928 --> 01:19:33.288 But you can plot whatever

NOTE Confidence: 0.844546859

01:19:33.288 --> 01:19:34.595 statistics you want here to kind

NOTE Confidence: 0.844546859

01:19:34.595 --> 01:19:36.440 of get an idea of what's going on.

NOTE Confidence: 0.844546859

01:19:36.440 --> 01:19:37.736 Viewing it in 3D and you

NOTE Confidence: 0.844546859

01:19:37.736 --> 01:19:38.600 get these structures here,

NOTE Confidence: 0.844546859

01:19:38.600 --> 01:19:39.804 So these are surfaces.

NOTE Confidence: 0.844546859

01:19:39.804 --> 01:19:42.375 So it's actually nice thing about Vantage is

NOTE Confidence: 0.844546859

01:19:42.375 --> 01:19:44.196 it's actually plotting the actual surfaces.

NOTE Confidence: 0.844546859

01:19:44.196 --> 01:19:46.200 So you don't you're not seeing a dot,

NOTE Confidence: 0.844546859

01:19:46.200 --> 01:19:47.764 you're seeing the actual

NOTE Confidence: 0.844546859

01:19:47.764 --> 01:19:49.719 surface object in 3D here.

NOTE Confidence: 0.844546859

01:19:49.720 --> 01:19:50.860 These are the actual surface

NOTE Confidence: 0.844546859

01:19:50.860 --> 01:19:52.000 objects relative to each other.

NOTE Confidence: 0.844546859

01:19:52.000 --> 01:19:53.435 So the small guys are over here,

NOTE Confidence: 0.844546859

01:19:53.440 --> 01:19:54.760 the big guys are over here.

NOTE Confidence: 0.844546859

01:19:54.760 --> 01:19:57.147 So you can actually see them side

NOTE Confidence: 0.844546859

01:19:57.147 --> 01:19:59.398 by side rendered in the structure.

NOTE Confidence: 0.844546859

01:19:59.400 --> 01:20:01.784 So like if you have guys and you're

NOTE Confidence: 0.844546859

01:20:01.784 --> 01:20:04.119 doing a plot here and looking at

NOTE Confidence: 0.844546859

01:20:04.120 --> 01:20:06.280 you know different parameters here,

NOTE Confidence: 0.844546859

01:20:06.280 --> 01:20:07.678 you can look at these colors,

NOTE Confidence: 0.844546859

01:20:07.680 --> 01:20:09.192 you can look at the size of the structures,

NOTE Confidence: 0.844546859

01:20:09.200 --> 01:20:09.508 Oh yeah,

NOTE Confidence: 0.844546859

01:20:09.508 --> 01:20:10.586 look at all the small ones that

NOTE Confidence: 0.844546859

01:20:10.586 --> 01:20:11.840 are at this part of the structure.

NOTE Confidence: 0.844546859

01:20:11.840 --> 01:20:13.184 It's nice, kind of.

NOTE Confidence: 0.844546859

01:20:13.184 --> 01:20:15.200 Could be a visual tools kind

NOTE Confidence: 0.844546859

01:20:15.270 --> 01:20:16.878 of show certain things.

NOTE Confidence: 0.844546859

01:20:16.880 --> 01:20:17.252 You know,

NOTE Confidence: 0.844546859

01:20:17.252 --> 01:20:18.368 to a lab meeting or your

NOTE Confidence: 0.844546859

01:20:18.368 --> 01:20:19.475 colleagues or something to kind

NOTE Confidence: 0.844546859

01:20:19.475 --> 01:20:20.635 of show these processes there.

NOTE Confidence: 0.844546859

01:20:20.640 --> 01:20:21.595 So Advantage can be a

NOTE Confidence: 0.844546859

01:20:21.595 --> 01:20:22.359 really powerful little tool.

NOTE Confidence: 0.844546859

01:20:22.360 --> 01:20:24.194 There also is a gallery tool here,

NOTE Confidence: 0.844546859

01:20:24.200 --> 01:20:27.434 plus every single punked up by itself.

NOTE Confidence: 0.844546859

01:20:27.440 --> 01:20:28.700 Kind of cool.

NOTE Confidence: 0.844546859

01:20:28.700 --> 01:20:31.120 Again, you can color code it as well.

NOTE Confidence: 0.844546859

01:20:31.120 --> 01:20:32.257 Put in here and say, oh,

NOTE Confidence: 0.844546859

01:20:32.257 --> 01:20:35.576 let's color code it based on sphericity.

NOTE Confidence: 0.844546859

01:20:35.576 --> 01:20:37.880 There you go, right?

NOTE Confidence: 0.844546859

01:20:37.880 --> 01:20:40.320 Not only is it by volume or area,

NOTE Confidence: 0.844546859

01:20:40.320 --> 01:20:41.400 but now it's color-coded

NOTE Confidence: 0.844546859

01:20:41.400 --> 01:20:42.480 which ones are spherical.

NOTE Confidence: 0.844546859

01:20:42.480 --> 01:20:44.016 So the ones that are purple

NOTE Confidence: 0.844546859

01:20:44.016 --> 01:20:45.040 are the least spherical,

NOTE Confidence: 0.844546859

01:20:45.040 --> 01:20:48.793 The ones that are red are the most spherical,

NOTE Confidence: 0.844546859

01:20:48.800 --> 01:20:49.004 right.

NOTE Confidence: 0.844546859

01:20:49.004 --> 01:20:50.228 You can see that here and

NOTE Confidence: 0.844546859

01:20:50.228 --> 01:20:51.440 you can plot that that's.

NOTE Confidence: 0.844546859

01:20:51.440 --> 01:20:52.819 So that's kind of an interesting way

NOTE Confidence: 0.844546859

01:20:52.819 --> 01:20:54.299 to kind of visualize every single bunk

NOTE Confidence: 0.844546859

01:20:54.299 --> 01:20:56.319 that kind of in a kind of ordered array.

NOTE Confidence: 0.844546859

01:20:56.320 --> 01:20:58.168 It's a nice little feature of the

NOTE Confidence: 0.844546859

01:20:58.168 --> 01:21:00.209 software to kind of do that if you

NOTE Confidence: 0.844546859

01:21:00.209 --> 01:21:03.400 wanted to do something like that.

NOTE Confidence: 0.844546859

01:21:03.400 --> 01:21:05.640 Finally, go back to Surf Beth mode,

NOTE Confidence: 0.844546859

01:21:05.640 --> 01:21:09.520 just to kind of wrap it up here,

NOTE Confidence: 0.844546859

01:21:09.520 --> 01:21:12.796 the idea of the snapshots I mentioned,

NOTE Confidence: 0.844546859

01:21:12.800 --> 01:21:14.634 right, Whatever you see on the screen,

NOTE Confidence: 0.844546859

01:21:14.640 --> 01:21:15.576 that's what you get.

NOTE Confidence: 0.844546859

01:21:15.576 --> 01:21:17.320 So if I have a screen here,

NOTE Confidence: 0.844546859

01:21:17.320 --> 01:21:19.600 whether I have a surface on or not,

NOTE Confidence: 0.805986653571429

01:21:19.600 --> 01:21:23.002 right, that Surface is going to be a snapshot

NOTE Confidence: 0.805986653571429

01:21:23.002 --> 01:21:25.620 of this image will return, you're right.

NOTE Confidence: 0.805986653571429

01:21:25.620 --> 01:21:26.640 So I do something like that.

NOTE Confidence: 0.805986653571429

01:21:26.640 --> 01:21:28.600 That's going to be part of the image.

NOTE Confidence: 0.805986653571429

01:21:28.600 --> 01:21:29.592 Again, my scale bar.

NOTE Confidence: 0.805986653571429

01:21:29.592 --> 01:21:30.832 Wherever my scale bar is,

NOTE Confidence: 0.805986653571429

01:21:30.840 --> 01:21:32.480 that's going to be on my scale bar.

NOTE Confidence: 0.805986653571429

01:21:32.480 --> 01:21:34.280 You can change the background.

NOTE Confidence: 0.805986653571429

01:21:34.280 --> 01:21:36.956 Right now my background is black,

NOTE Confidence: 0.805986653571429

01:21:36.960 --> 01:21:38.760 mainly because I have the volume turned on.

NOTE Confidence: 0.805986653571429

01:21:38.760 --> 01:21:39.996 If I turn the volume off,

NOTE Confidence: 0.805986653571429

01:21:40.000 --> 01:21:42.422 you'll see I have this kind of

NOTE Confidence: 0.805986653571429

01:21:42.422 --> 01:21:43.932 gradient background from brown,

NOTE Confidence: 0.805986653571429

01:21:43.932 --> 01:21:45.556 from Gray to white.

NOTE Confidence: 0.805986653571429

01:21:45.560 --> 01:21:47.486 Again, if you want to change any of the

NOTE Confidence: 0.805986653571429

01:21:47.486 --> 01:21:49.080 display properties under preferences,

NOTE Confidence: 0.805986653571429

01:21:49.080 --> 01:21:51.425 you're going to go over here to

NOTE Confidence: 0.805986653571429

01:21:51.425 --> 01:21:53.410 display and you can turn on the

NOTE Confidence: 0.805986653571429

01:21:53.410 --> 01:21:55.040 background to whatever color you want.

NOTE Confidence: 0.805986653571429

01:21:55.040 --> 01:21:56.958 I use this Linear Progress for blending.

NOTE Confidence: 0.805986653571429

01:21:56.960 --> 01:21:57.704 It's my favorite.

NOTE Confidence: 0.805986653571429

01:21:57.704 --> 01:21:59.192 I think it looks pretty cool.

NOTE Confidence: 0.805986653571429

01:21:59.200 --> 01:22:01.512 Gives you a little bit of depth if you will,

NOTE Confidence: 0.805986653571429

01:22:01.512 --> 01:22:02.752 using this kind of blending.

NOTE Confidence: 0.805986653571429

01:22:02.760 --> 01:22:03.720 Some people don't like it.

NOTE Confidence: 0.805986653571429

01:22:03.720 --> 01:22:05.196 You can turn it off to a single color.

NOTE Confidence: 0.805986653571429

01:22:05.200 --> 01:22:05.518 Gray.

NOTE Confidence: 0.805986653571429

01:22:05.518 --> 01:22:07.744 I do it like a light light

NOTE Confidence: 0.805986653571429

01:22:07.744 --> 01:22:09.599 dark Gray is my favorite.

NOTE Confidence: 0.805986653571429

01:22:09.600 --> 01:22:10.797 Black is a little bit too black,

NOTE Confidence: 0.805986653571429

01:22:10.800 --> 01:22:13.000 white is way too white.

NOTE Confidence: 0.805986653571429

01:22:13.000 --> 01:22:14.812 This is a nice little gradient

NOTE Confidence: 0.805986653571429

01:22:14.812 --> 01:22:16.760 in between view of of the data

NOTE Confidence: 0.89428626

01:22:18.880 --> 01:22:20.320 in terms of visualization, right?

NOTE Confidence: 0.89428626

01:22:20.320 --> 01:22:21.496 Like I said, it is what you

NOTE Confidence: 0.89428626

01:22:21.496 --> 01:22:22.839 get if I'm rotated like that.

NOTE Confidence: 0.89428626

01:22:22.840 --> 01:22:24.040 That's going to be my snapshot

NOTE Confidence: 0.89428626

01:22:24.040 --> 01:22:25.000 wherever my scale bar is.

NOTE Confidence: 0.89428626

01:22:25.000 --> 01:22:27.303 It's going to take a picture of

NOTE Confidence: 0.89428626

01:22:27.303 --> 01:22:29.274 this whole image view that we

NOTE Confidence: 0.89428626

01:22:29.274 --> 01:22:31.240 have here In terms of animation,

NOTE Confidence: 0.679385823

01:22:33.320 --> 01:22:34.488 animation is pretty straightforward.

NOTE Confidence: 0.679385823

01:22:34.488 --> 01:22:36.240 It's a it's a keyframe animation.

NOTE Confidence: 0.679385823

01:22:36.240 --> 01:22:37.047 Again, same deal.

NOTE Confidence: 0.679385823

01:22:37.047 --> 01:22:38.661 Whatever you see on the screen

NOTE Confidence: 0.679385823

01:22:38.661 --> 01:22:40.484 is what you get. So for example,

NOTE Confidence: 0.679385823

01:22:40.484 --> 01:22:42.647 if I wanted to just take this image

NOTE Confidence: 0.679385823

01:22:42.647 --> 01:22:45.400 right here as it is and do a 360 horizontal,

NOTE Confidence: 0.679385823

01:22:45.400 --> 01:22:46.760 I can click this button,

NOTE Confidence: 0.679385823

01:22:46.760 --> 01:22:48.356 it's going to add these little keyframes.

NOTE Confidence: 0.679385823

01:22:48.360 --> 01:22:49.956 You can see there's a A-frame here,

NOTE Confidence: 0.679385823

01:22:49.960 --> 01:22:52.276 A-frame here, A-frame here, A-frame here.

NOTE Confidence: 0.679385823

01:22:52.280 --> 01:22:53.675 And if I click on here and I rotate,

NOTE Confidence: 0.679385823

01:22:53.680 --> 01:22:56.236 you'll see it's going to just

NOTE Confidence: 0.679385823

01:22:56.236 --> 01:22:58.224 rotate it horizontally 360° because

NOTE Confidence: 0.679385823

01:22:58.224 --> 01:23:00.000 I clicked that 360° horizontal

NOTE Confidence: 0.679385823

01:23:00.000 --> 01:23:01.800 automatically boot that in there.

NOTE Confidence: 0.679385823

01:23:01.800 --> 01:23:02.796 If I click here,

NOTE Confidence: 0.679385823

01:23:02.796 --> 01:23:04.872 I can change the frames from 500 to

NOTE Confidence: 0.679385823

01:23:04.872 --> 01:23:06.952 1000 means it's going to be much slower.

NOTE Confidence: 0.679385823

01:23:06.960 --> 01:23:08.270 The movement and turning is

NOTE Confidence: 0.679385823

01:23:08.270 --> 01:23:09.318 going to be slower.

NOTE Confidence: 0.679385823

01:23:09.320 --> 01:23:10.560 It's going to be a little bit smoother.

NOTE Confidence: 0.679385823

01:23:10.560 --> 01:23:11.700 It's going to take a

NOTE Confidence: 0.679385823

01:23:11.700 --> 01:23:12.840 little bit longer to play,

NOTE Confidence: 0.679385823

01:23:12.840 --> 01:23:16.200 could be a longer movie now depends on how

NOTE Confidence: 0.679385823

01:23:16.200 --> 01:23:18.400 many frames per second you play the movie.

NOTE Confidence: 0.679385823

01:23:18.400 --> 01:23:20.038 That's when you click this button here,

NOTE Confidence: 0.679385823

01:23:20.040 --> 01:23:22.340 it'll give you an option here to say how many

NOTE Confidence: 0.679385823

01:23:22.393 --> 01:23:24.436 frames per second do we want it to play.

NOTE Confidence: 0.679385823

01:23:24.440 --> 01:23:26.274 So 24 is pretty much our default.

NOTE Confidence: 0.679385823

01:23:26.280 --> 01:23:28.720 You can set it to whatever you want.

NOTE Confidence: 0.679385823

01:23:28.720 --> 01:23:29.875 And then when you play the movie,

NOTE Confidence: 0.679385823

01:23:29.880 --> 01:23:31.256 you can kind of predict how long that

NOTE Confidence: 0.679385823

01:23:31.256 --> 01:23:32.699 movie is going to last based on how

NOTE Confidence: 0.679385823

01:23:32.699 --> 01:23:34.005 many frames you have and the frames

NOTE Confidence: 0.679385823

01:23:34.005 --> 01:23:35.314 per second that it's going to play.

NOTE Confidence: 0.679385823

01:23:35.320 --> 01:23:36.776 So if you wanted to play for

NOTE Confidence: 0.679385823

01:23:36.776 --> 01:23:37.800 a specified amount of time,

NOTE Confidence: 0.679385823

01:23:37.800 --> 01:23:40.736 you can figure that out from your

NOTE Confidence: 0.679385823

01:23:40.736 --> 01:23:42.583 data set if you want to come in here

NOTE Confidence: 0.679385823

01:23:42.583 --> 01:23:44.038 and modify into these structures.

NOTE Confidence: 0.679385823

01:23:44.040 --> 01:23:45.912 Again, I can come up over here and say,

NOTE Confidence: 0.679385823

01:23:45.920 --> 01:23:47.690 OK, what I want to do 360 horizontal,

NOTE Confidence: 0.679385823

01:23:47.690 --> 01:23:48.915 but at this frame here,

NOTE Confidence: 0.679385823

01:23:48.920 --> 01:23:50.680 I want to zoom in to this guy,

NOTE Confidence: 0.679385823

01:23:50.680 --> 01:23:53.158 maybe be rotated a little bit

NOTE Confidence: 0.679385823

01:23:53.160 --> 01:23:55.464 that I can modify.

NOTE Confidence: 0.679385823

01:23:55.464 --> 01:23:57.300 I'm just modifying that keyframe so it's

NOTE Confidence: 0.679385823

01:23:57.300 --> 01:23:58.958 going to still do everything the same.

NOTE Confidence: 0.679385823

01:23:58.960 --> 01:24:00.012 I hit play here,

NOTE Confidence: 0.679385823

01:24:00.012 --> 01:24:01.886 it's going to go through the data

NOTE Confidence: 0.679385823

01:24:01.886 --> 01:24:03.478 set and you can see as it's turning,

NOTE Confidence: 0.679385823

01:24:03.480 --> 01:24:04.680 it's going to actually,

NOTE Confidence: 0.679385823

01:24:04.680 --> 01:24:05.280 you know,

NOTE Confidence: 0.679385823

01:24:05.280 --> 01:24:06.488 interpolate the zoom in,

NOTE Confidence: 0.679385823

01:24:06.488 --> 01:24:08.926 zoom into my data set now and it's

NOTE Confidence: 0.679385823

01:24:08.926 --> 01:24:11.190 going to zoom back out as it continues

NOTE Confidence: 0.679385823

01:24:11.259 --> 01:24:12.829 the rotation and keep turning

NOTE Confidence: 0.679385823

01:24:12.829 --> 01:24:14.876 around the data set to the end.

NOTE Confidence: 0.679385823

01:24:14.876 --> 01:24:17.000 So that's a really cool way to kind of,

NOTE Confidence: 0.679385823

01:24:17.000 --> 01:24:18.080 you know, make a rotation,

NOTE Confidence: 0.679385823

01:24:18.080 --> 01:24:19.664 maybe zoom in on a particular

NOTE Confidence: 0.679385823

01:24:19.664 --> 01:24:20.720 cell and zoom out.

NOTE Confidence: 0.679385823

01:24:20.720 --> 01:24:22.712 I typically would recommend people to

NOTE Confidence: 0.679385823

01:24:22.712 --> 01:24:25.852 kind of do the movements very simply.

NOTE Confidence: 0.679385823

01:24:25.852 --> 01:24:28.196 Don't make it complicated.

NOTE Confidence: 0.679385823

01:24:28.200 --> 01:24:29.400 The more complicated you get,

NOTE Confidence: 0.679385823

01:24:29.400 --> 01:24:30.576 the more chances are you're going

NOTE Confidence: 0.679385823

01:24:30.576 --> 01:24:32.184 to kind of have a messy movie that's

NOTE Confidence: 0.679385823

01:24:32.184 --> 01:24:33.580 going to give you a headache that's

NOTE Confidence: 0.679385823

01:24:33.580 --> 01:24:35.576 going to be hard to follow and hard to edit.

NOTE Confidence: 0.679385823

01:24:35.576 --> 01:24:37.456 Keep the movie relatively simple

NOTE Confidence: 0.679385823

01:24:37.456 --> 01:24:38.960 within the data set.

NOTE Confidence: 0.679385823

01:24:38.960 --> 01:24:41.750 You can add these frames manually as well.

NOTE Confidence: 0.679385823

01:24:41.750 --> 01:24:44.235 So delete all these guys and set

NOTE Confidence: 0.679385823

01:24:44.235 --> 01:24:45.479 it like this,

NOTE Confidence: 0.679385823

01:24:45.480 --> 01:24:47.480 and I can set this as my primary and it

NOTE Confidence: 0.679385823

01:24:47.534 --> 01:24:49.640 sets the primary and the end as the same.

NOTE Confidence: 0.770389871428571

01:24:49.640 --> 01:24:51.278 So it kind of loops on itself.

NOTE Confidence: 0.770389871428571

01:24:51.280 --> 01:24:52.624 But let's just say I just want

NOTE Confidence: 0.770389871428571

01:24:52.624 --> 01:24:54.392 to zoom into this guy here and do

NOTE Confidence: 0.770389871428571

01:24:54.392 --> 01:24:55.740 something like that, add a keyframe,

NOTE Confidence: 0.770389871428571

01:24:55.740 --> 01:24:57.280 maybe that's all you want to do.

NOTE Confidence: 0.770389871428571

01:24:57.280 --> 01:24:58.400 So it'll it'll just come.

NOTE Confidence: 0.770389871428571

01:24:58.400 --> 01:24:59.720 It'll just come from here.

NOTE Confidence: 0.770389871428571

01:24:59.720 --> 01:25:00.524 Stop it. Right.

NOTE Confidence: 0.770389871428571

01:25:00.524 --> 01:25:02.400 So it'll it'll start at this point,

NOTE Confidence: 0.770389871428571

01:25:02.400 --> 01:25:05.280 it'll zoom in and then it'll zoom out.

NOTE Confidence: 0.770389871428571

01:25:05.280 --> 01:25:06.267 Pretty, pretty straightforward.

NOTE Confidence: 0.770389871428571

01:25:06.267 --> 01:25:08.848 If I wanted to add another keyframe in

NOTE Confidence: 0.770389871428571

01:25:08.848 --> 01:25:10.640 the middle here and say you know what,

NOTE Confidence: 0.770389871428571

01:25:10.640 --> 01:25:13.240 I wanted to turn on,

NOTE Confidence: 0.770389871428571

01:25:13.240 --> 01:25:18.158 I wanted to turn on there those turn that on,

NOTE Confidence: 0.770389871428571

01:25:18.158 --> 01:25:19.196 hit add keyframe.

NOTE Confidence: 0.770389871428571

01:25:19.200 --> 01:25:21.266 So now as I go into here, it'll zoom in,

NOTE Confidence: 0.770389871428571

01:25:21.266 --> 01:25:22.838 when it gets to that keyframe,

NOTE Confidence: 0.770389871428571

01:25:22.840 --> 01:25:24.550 those guys will turn on and then

NOTE Confidence: 0.770389871428571

01:25:24.550 --> 01:25:25.635 when I get back to this keyframe,

NOTE Confidence: 0.770389871428571

01:25:25.640 --> 01:25:26.744 they'll turn off, right?

NOTE Confidence: 0.770389871428571

01:25:26.744 --> 01:25:29.024 And so you can modify this however you

NOTE Confidence: 0.770389871428571

01:25:29.024 --> 01:25:31.280 see what you can move these guys around.

NOTE Confidence: 0.770389871428571

01:25:31.280 --> 01:25:33.200 So if you wanted to go really quick,

NOTE Confidence: 0.770389871428571

01:25:33.200 --> 01:25:36.351 you can do this, right?

NOTE Confidence: 0.770389871428571

01:25:36.351 --> 01:25:39.479 And so if I play this movie here,

NOTE Confidence: 0.770389871428571

01:25:39.480 --> 01:25:41.782 it'll, you know,

NOTE Confidence: 0.770389871428571

01:25:41.782 --> 01:25:44.519 it'll go really quick between the two,

NOTE Confidence: 0.770389871428571

01:25:44.520 --> 01:25:46.060 right to there and then we'll kind

NOTE Confidence: 0.770389871428571

01:25:46.060 --> 01:25:47.970 of go nice and slow and move there.

NOTE Confidence: 0.770389871428571

01:25:47.970 --> 01:25:50.208 So it's just based on how many frames

NOTE Confidence: 0.770389871428571

01:25:50.208 --> 01:25:52.217 are in that particular data set to

NOTE Confidence: 0.770389871428571

01:25:52.217 --> 01:25:54.677 kind of control the speed and the size.

NOTE Confidence: 0.770389871428571

01:25:54.680 --> 01:25:56.479 We typically save as an MP4 file.

NOTE Confidence: 0.770389871428571

01:25:56.480 --> 01:25:59.520 That's our default using this

NOTE Confidence: 0.770389871428571

01:25:59.520 --> 01:26:00.560 codec that we have here.

NOTE Confidence: 0.770389871428571

01:26:00.560 --> 01:26:02.328 It gives us the best stability

NOTE Confidence: 0.770389871428571

01:26:02.328 --> 01:26:04.260 across different platforms, Mac, PC,

NOTE Confidence: 0.770389871428571

01:26:04.260 --> 01:26:05.760 PowerPoint, those sort of things.

NOTE Confidence: 0.770389871428571

01:26:05.760 --> 01:26:07.664 Does a pretty good job of being

NOTE Confidence: 0.770389871428571

01:26:07.664 --> 01:26:08.894 compatible with both applications

NOTE Confidence: 0.770389871428571

01:26:08.894 --> 01:26:11.148 where you're going to play the movie

NOTE Confidence: 0.770389871428571

01:26:11.148 --> 01:26:13.320 and and and be in the movie again.

NOTE Confidence: 0.770389871428571

01:26:13.320 --> 01:26:15.000 What you see is what you get.

NOTE Confidence: 0.770389871428571

01:26:15.000 --> 01:26:15.896 Sometimes people are like,

NOTE Confidence: 0.770389871428571

01:26:15.896 --> 01:26:17.280 well, I don't want that frame,

NOTE Confidence: 0.770389871428571

01:26:17.280 --> 01:26:18.520 I don't want these numbers.

NOTE Confidence: 0.770389871428571

01:26:18.520 --> 01:26:19.440 I I like the frame,

NOTE Confidence: 0.770389871428571

01:26:19.440 --> 01:26:21.078 but I don't want the numbers

NOTE Confidence: 0.770389871428571

01:26:21.080 --> 01:26:22.718 go into the frame and modify.

NOTE Confidence: 0.770389871428571

01:26:22.720 --> 01:26:24.112 Because even if I come up here and

NOTE Confidence: 0.770389871428571

01:26:24.112 --> 01:26:25.897 and I turn off the box and I turn off

NOTE Confidence: 0.770389871428571

01:26:25.897 --> 01:26:27.383 the grid and I turn off the ticket

NOTE Confidence: 0.770389871428571

01:26:27.383 --> 01:26:29.544 Marks and I turn off the access labels,

NOTE Confidence: 0.770389871428571

01:26:29.544 --> 01:26:32.280 my keyframes still has them all in there

NOTE Confidence: 0.770389871428571

01:26:32.280 --> 01:26:35.588 and it should oh actually no interesting,

NOTE Confidence: 0.770389871428571

01:26:35.588 --> 01:26:36.839 didn't save it.

NOTE Confidence: 0.770389871428571

01:26:36.840 --> 01:26:37.148 OK,

NOTE Confidence: 0.770389871428571

01:26:37.148 --> 01:26:39.612 so make sure you turn those off when

NOTE Confidence: 0.770389871428571

01:26:39.612 --> 01:26:41.768 you make your keyframes because they

NOTE Confidence: 0.770389871428571

01:26:41.768 --> 01:26:43.560 are going to be part of that keyframe.

NOTE Confidence: 0.770389871428571

01:26:43.560 --> 01:26:45.240 And if you don't want them in there,

NOTE Confidence: 0.770389871428571

01:26:45.240 --> 01:26:47.829 turn them off and then set those keyframes

NOTE Confidence: 0.770389871428571

01:26:47.829 --> 01:26:49.800 so that you don't have those movies on again.

NOTE Confidence: 0.770389871428571

01:26:49.800 --> 01:26:51.798 Same with the the scale bar.

NOTE Confidence: 0.770389871428571

01:26:51.800 --> 01:26:54.159 The scale bar is going to move.

NOTE Confidence: 0.770389871428571

01:26:54.160 --> 01:26:55.440 Some people get a little

NOTE Confidence: 0.770389871428571

01:26:55.440 --> 01:26:56.720 bit freaked out by that,

NOTE Confidence: 0.770389871428571

01:26:56.720 --> 01:26:58.840 but as you're zooming in,

NOTE Confidence: 0.770389871428571

01:26:58.840 --> 01:27:00.387 the scale bar will adjust and you'll

NOTE Confidence: 0.770389871428571

01:27:00.387 --> 01:27:02.119 see it kind of tweak a little bit.

NOTE Confidence: 0.770389871428571

01:27:02.120 --> 01:27:03.420 Sometimes the scale bar as

NOTE Confidence: 0.770389871428571

01:27:03.420 --> 01:27:04.620 you're rotating it, see how it,

NOTE Confidence: 0.770389871428571

01:27:04.620 --> 01:27:05.600 I don't know if you noticed there,

NOTE Confidence: 0.770389871428571

01:27:05.600 --> 01:27:07.118 see how how I'm rotating it,

NOTE Confidence: 0.770389871428571

01:27:07.120 --> 01:27:09.200 that scale bar changes.

NOTE Confidence: 0.770389871428571

01:27:09.200 --> 01:27:10.240 That's normal.

NOTE Confidence: 0.770389871428571

01:27:10.240 --> 01:27:11.524 That's because the scale

NOTE Confidence: 0.770389871428571

01:27:11.524 --> 01:27:13.450 bar is based on the center

NOTE Confidence: 0.886225345384615

01:27:13.518 --> 01:27:16.432 of the volume. And so when you're

NOTE Confidence: 0.886225345384615

01:27:16.432 --> 01:27:19.480 visualizing the center of the volume,

NOTE Confidence: 0.886225345384615

01:27:19.480 --> 01:27:20.554 that scale bar is based on

NOTE Confidence: 0.886225345384615

01:27:20.554 --> 01:27:21.600 the center of the volume.

NOTE Confidence: 0.886225345384615

01:27:21.600 --> 01:27:23.250 We view our data in what's

NOTE Confidence: 0.886225345384615

01:27:23.250 --> 01:27:24.075 called perspective mode.

NOTE Confidence: 0.886225345384615

01:27:24.080 --> 01:27:27.280 Just so you kind of get this out there,

NOTE Confidence: 0.886225345384615

01:27:27.280 --> 01:27:28.432 we have two modes.

NOTE Confidence: 0.886225345384615

01:27:28.432 --> 01:27:30.160 There's perspective mode and orthogonal mode.

NOTE Confidence: 0.886225345384615

01:27:30.160 --> 01:27:31.515 Almost 90% of the time

NOTE Confidence: 0.886225345384615

01:27:31.515 --> 01:27:32.599 you're in perspective mode,

NOTE Confidence: 0.886225345384615

01:27:32.600 --> 01:27:34.280 especially with the 3D data set,

NOTE Confidence: 0.886225345384615

01:27:34.280 --> 01:27:35.864 mainly because you want to get a little

NOTE Confidence: 0.886225345384615

01:27:35.864 --> 01:27:37.594 bit of a better 3D feel of your file.

NOTE Confidence: 0.886225345384615

01:27:37.600 --> 01:27:39.399 Which means the files in the front

NOTE Confidence: 0.886225345384615

01:27:39.399 --> 01:27:41.459 are going to look bigger than the The

NOTE Confidence: 0.886225345384615

01:27:41.459 --> 01:27:42.710 cells in the front are going to look a

NOTE Confidence: 0.886225345384615

01:27:42.747 --> 01:27:44.232 little bit bigger than the cells in the back,

NOTE Confidence: 0.886225345384615

01:27:44.240 --> 01:27:46.360 but they're the same size.

NOTE Confidence: 0.886225345384615

01:27:46.360 --> 01:27:48.040 But again, it's just that perspective

NOTE Confidence: 0.886225345384615

01:27:48.040 --> 01:27:49.448 showing that they're, they're different.

NOTE Confidence: 0.886225345384615

01:27:49.448 --> 01:27:52.280 But the scale bar is going to be based on,

NOTE Confidence: 0.886225345384615

01:27:52.280 --> 01:27:53.808 oops, the scale bar is going to be

NOTE Confidence: 0.886225345384615

01:27:53.808 --> 01:27:55.359 based on the center of the volume,

NOTE Confidence: 0.886225345384615

01:27:55.360 --> 01:27:56.260 based on the camera.

NOTE Confidence: 0.886225345384615

01:27:56.260 --> 01:27:57.610 So it's going to be based

NOTE Confidence: 0.886225345384615

01:27:57.662 --> 01:27:58.360 on somewhere in there.

NOTE Confidence: 0.886225345384615

01:27:58.360 --> 01:27:59.360 That's the that's the size,

NOTE Confidence: 0.886225345384615

01:27:59.360 --> 01:28:00.240 Wherever your center is,

NOTE Confidence: 0.886225345384615

01:28:00.240 --> 01:28:01.560 that's the size of the structure.

NOTE Confidence: 0.886225345384615

01:28:01.560 --> 01:28:02.760 So as you rotate this guy,

NOTE Confidence: 0.886225345384615

01:28:02.760 --> 01:28:04.034 you'll see it moving a little bit.

NOTE Confidence: 0.886225345384615

01:28:04.040 --> 01:28:05.797 Depending on what zoom library you're in,

NOTE Confidence: 0.886225345384615

01:28:05.800 --> 01:28:07.600 you might see that being modified.

NOTE Confidence: 0.886225345384615

01:28:07.600 --> 01:28:08.587 That is normal.

NOTE Confidence: 0.886225345384615

01:28:08.587 --> 01:28:10.232 That's often usually a telltale

NOTE Confidence: 0.886225345384615

01:28:10.232 --> 01:28:12.158 sign that it's in a Mars movie.

NOTE Confidence: 0.886225345384615

01:28:12.160 --> 01:28:14.158 Sometimes people post things on Facebook

NOTE Confidence: 0.886225345384615

01:28:14.158 --> 01:28:16.080 and YouTube and things like that.

NOTE Confidence: 0.886225345384615

01:28:16.080 --> 01:28:16.664 I'm like, Oh yeah,

NOTE Confidence: 0.886225345384615

01:28:16.664 --> 01:28:17.394 that's in a Mars movie.

NOTE Confidence: 0.886225345384615

01:28:17.400 --> 01:28:19.720 I can tell because of the scale bar.

NOTE Confidence: 0.886225345384615

01:28:19.720 --> 01:28:21.958 That's just something we've done people,

NOTE Confidence: 0.886225345384615

01:28:21.960 --> 01:28:23.202 because we have to put a

NOTE Confidence: 0.886225345384615

01:28:23.202 --> 01:28:24.503 scale wall somewhere with a 3D

NOTE Confidence: 0.886225345384615

01:28:24.503 --> 01:28:25.359 perspective mode data set.

NOTE Confidence: 0.886225345384615

01:28:25.360 --> 01:28:27.719 So that's just what we've been doing.

NOTE Confidence: 0.886225345384615

01:28:27.720 --> 01:28:28.270 And again,

NOTE Confidence: 0.886225345384615

01:28:28.270 --> 01:28:30.470 it's the best estimate that we can can

NOTE Confidence: 0.886225345384615

01:28:30.535 --> 01:28:32.560 give in terms of the the 3D data set.

NOTE Confidence: 0.951596238

01:28:35.120 --> 01:28:39.324 OK, well, I think I'm going to stop there.

NOTE Confidence: 0.951596238

01:28:39.324 --> 01:28:41.400 I think I don't know if Matthias,

NOTE Confidence: 0.951596238

01:28:41.400 --> 01:28:42.520 if you're still there,

NOTE Confidence: 0.951596238

01:28:42.520 --> 01:28:44.200 if you want to say anything.

NOTE Confidence: 0.951596238

01:28:44.200 --> 01:28:47.175 I don't know if I see any

NOTE Confidence: 0.951596238

01:28:47.175 --> 01:28:50.098 questions specifically. Yeah.

NOTE Confidence: 0.951596238

01:28:50.098 --> 01:28:53.024 So, yeah, there were a bunch of

NOTE Confidence: 0.951596238

01:28:53.024 --> 01:28:55.656 questions on the that people put in

NOTE Confidence: 0.951596238

01:28:55.656 --> 01:28:57.840 as you went through the presentation.

NOTE Confidence: 0.951596238

01:28:57.840 --> 01:28:59.840 So you cannot see them.

NOTE Confidence: 0.951596238

01:28:59.840 --> 01:29:03.872 I can read them. I am looking for them.

NOTE Confidence: 0.951596238

01:29:03.880 --> 01:29:05.758 Oh, wait, hold on. It's minimized.

NOTE Confidence: 0.951596238

01:29:05.760 --> 01:29:09.920 How do I? Yeah, let me try that.

NOTE Confidence: 0.951596238

01:29:09.920 --> 01:29:11.040 Oh, yes, there they are.

NOTE Confidence: 0.951596238

01:29:11.040 --> 01:29:14.040 Excellent. OK, so I would start,

NOTE Confidence: 0.951596238

01:29:14.040 --> 01:29:15.030 I mean, the first question

NOTE Confidence: 0.951596238

01:29:15.030 --> 01:29:16.440 that came in was from Caroline.

NOTE Confidence: 0.951596238

01:29:16.440 --> 01:29:17.382 So she's asking,

NOTE Confidence: 0.951596238

01:29:17.382 --> 01:29:20.199 when you manually place spots in a 3D image,

NOTE Confidence: 0.951596238

01:29:20.200 --> 01:29:22.188 is there a way to make them

NOTE Confidence: 0.951596238

01:29:22.188 --> 01:29:24.080 the same size automatically?

NOTE Confidence: 0.951596238

01:29:24.080 --> 01:29:25.952 Whenever I place a spot and change its size,

NOTE Confidence: 0.951596238

01:29:25.960 --> 01:29:27.780 the next spot I place would not

NOTE Confidence: 0.951596238

01:29:27.780 --> 01:29:29.800 have the same size and I need

NOTE Confidence: 0.951596238

01:29:29.800 --> 01:29:31.275 to manually resize every spot.

NOTE Confidence: 0.951596238

01:29:31.280 --> 01:29:33.040 Yeah.

NOTE Confidence: 0.951596238

01:29:33.040 --> 01:29:36.784 So typically what I do when

NOTE Confidence: 0.951596238

01:29:36.784 --> 01:29:38.000 you're manually placing spots.

NOTE Confidence: 0.951596238

01:29:38.000 --> 01:29:40.317 So let's look at this example here.

NOTE Confidence: 0.951596238

01:29:40.320 --> 01:29:41.600 That's a great question.

NOTE Confidence: 0.951596238

01:29:41.600 --> 01:29:42.240 Let me

NOTE Confidence: 0.813539244

01:29:45.480 --> 01:29:48.160 turn off this here. Right. So

NOTE Confidence: 0.641837916666667

01:29:53.960 --> 01:29:57.440 where is that? Where is it Gray?

NOTE Confidence: 0.708231464

01:30:05.120 --> 01:30:06.120 Oh, I changed the color. OK,

NOTE Confidence: 0.927383925882353

01:30:08.560 --> 01:30:11.216 yeah, so so let's just say I detected

NOTE Confidence: 0.927383925882353

01:30:11.216 --> 01:30:13.670 all these spots manually and I wanted

NOTE Confidence: 0.927383925882353

01:30:13.670 --> 01:30:15.638 to add another spot of the same size.

NOTE Confidence: 0.927383925882353

01:30:15.640 --> 01:30:17.080 Say I wanted to add a spot right here,

NOTE Confidence: 0.927383925882353

01:30:17.080 --> 01:30:19.352 but I wanted the same size of this

NOTE Confidence: 0.927383925882353

01:30:19.352 --> 01:30:21.010 spot so often. Sometimes, yeah,

NOTE Confidence: 0.927383925882353

01:30:21.010 --> 01:30:22.840 if you don't change the size,

NOTE Confidence: 0.927383925882353

01:30:22.840 --> 01:30:24.280 usually it's going to be the same size.

NOTE Confidence: 0.927383925882353

01:30:24.280 --> 01:30:25.512 But you can come up here and say, OK,

NOTE Confidence: 0.927383925882353

01:30:25.512 --> 01:30:26.880 well I can come up here and I can,

NOTE Confidence: 0.927383925882353

01:30:26.880 --> 01:30:28.060 I can add a spot, whatever size I want.

NOTE Confidence: 0.927383925882353

01:30:28.060 --> 01:30:29.319 I can come up there and add a spot,

NOTE Confidence: 0.927383925882353

01:30:29.320 --> 01:30:30.695 But that's not obviously not

NOTE Confidence: 0.927383925882353

01:30:30.695 --> 01:30:31.795 the same size spot.

NOTE Confidence: 0.927383925882353

01:30:31.800 --> 01:30:33.235 You can hold down Shift and you

NOTE Confidence: 0.927383925882353

01:30:33.235 --> 01:30:34.996 can get rid of those spots as well.

NOTE Confidence: 0.927383925882353

01:30:35.000 --> 01:30:37.114 Shift click is to add the spot.

NOTE Confidence: 0.927383925882353

01:30:37.120 --> 01:30:39.130 But my rule of thumb is if you have some

NOTE Confidence: 0.927383925882353

01:30:39.186 --> 01:30:40.998 spots that are already been created,

NOTE Confidence: 0.927383925882353

01:30:41.000 --> 01:30:43.960 if you click on one of the spots,

NOTE Confidence: 0.927383925882353

01:30:43.960 --> 01:30:45.922 the size of the box automatically

NOTE Confidence: 0.927383925882353

01:30:45.922 --> 01:30:48.477 sets to the size that that spot is.

NOTE Confidence: 0.927383925882353

01:30:48.480 --> 01:30:50.200 Then if I come up here and add that spot,

NOTE Confidence: 0.927383925882353

01:30:50.200 --> 01:30:53.638 that should be the the exact same spot size.

NOTE Confidence: 0.927383925882353

01:30:53.640 --> 01:30:56.080 That's the the easiest way to do it.

NOTE Confidence: 0.927383925882353

01:30:56.080 --> 01:30:59.720 Changing the spot size manually is a

NOTE Confidence: 0.927383925882353

01:30:59.720 --> 01:31:01.880 pain because we can't do it as a group,

NOTE Confidence: 0.927383925882353

01:31:01.880 --> 01:31:03.959 it has to be done one at a time.

NOTE Confidence: 0.927383925882353

01:31:03.960 --> 01:31:05.920 But that that trick works pretty well.

NOTE Confidence: 0.927383925882353

01:31:05.920 --> 01:31:07.719 I I think that's probably the easiest

NOTE Confidence: 0.927383925882353

01:31:07.719 --> 01:31:09.733 way to kind of get that solution.

NOTE Confidence: 0.927383925882353

01:31:09.733 --> 01:31:12.798 Hopefully that addresses your question.

NOTE Confidence: 0.927383925882353

01:31:12.800 --> 01:31:15.195 So do you want me to read it?

NOTE Confidence: 0.927383925882353

01:31:15.200 --> 01:31:16.904 So how do you want to do?

NOTE Confidence: 0.927383925882353

01:31:16.904 --> 01:31:19.118 I can read it. OK, so yeah, I would go.

NOTE Confidence: 0.927383925882353

01:31:19.120 --> 01:31:22.120 I just got to expand it and get it out here.

NOTE Confidence: 0.927383925882353

01:31:22.120 --> 01:31:23.480 Does converting into Mars file

NOTE Confidence: 0.927383925882353

01:31:23.480 --> 01:31:24.840 change the original data set?

NOTE Confidence: 0.927383925882353

01:31:24.840 --> 01:31:28.836 No, it does not. So our conversion is lot.

NOTE Confidence: 0.927383925882353

01:31:28.840 --> 01:31:31.360 It's a lossless file conversion.

NOTE Confidence: 0.927383925882353

01:31:31.360 --> 01:31:34.219 So the the raw data, the pixel intensities,

NOTE Confidence: 0.927383925882353

01:31:34.219 --> 01:31:35.398 the voxel sizes,

NOTE Confidence: 0.927383925882353

01:31:35.400 --> 01:31:37.440 everything is exactly the same,

NOTE Confidence: 0.927383925882353

01:31:37.440 --> 01:31:38.880 The intensities are all the same.

NOTE Confidence: 0.927383925882353

01:31:38.880 --> 01:31:40.520 So if you if you acquire it as

NOTE Confidence: 0.927383925882353

01:31:40.520 --> 01:31:41.758 a 16 bit data set,

NOTE Confidence: 0.927383925882353

01:31:41.760 --> 01:31:43.400 the Mars file will be a 16 bit

NOTE Confidence: 0.927383925882353

01:31:43.400 --> 01:31:44.760 data set if it's a 32 bit.

NOTE Confidence: 0.927383925882353

01:31:44.760 --> 01:31:46.256 If it's a 8 bit, Mrs.

NOTE Confidence: 0.927383925882353

01:31:46.256 --> 01:31:48.272 will convert that file and be

NOTE Confidence: 0.927383925882353

01:31:48.272 --> 01:31:49.680 exactly the same file.

NOTE Confidence: 0.927383925882353

01:31:49.680 --> 01:31:52.464 Our file format is a multi

NOTE Confidence: 0.927383925882353

01:31:52.464 --> 01:31:54.320 resolution HDF 5 format.

NOTE Confidence: 0.927383925882353

01:31:54.320 --> 01:31:55.328 I'm sure that doesn't mean a

NOTE Confidence: 0.927383925882353

01:31:55.328 --> 01:31:56.480 whole lot to a lot of you,

NOTE Confidence: 0.927383925882353

01:31:56.480 --> 01:31:58.850 but it is a it is a method of visualizing

NOTE Confidence: 0.927383925882353

01:31:58.916 --> 01:32:01.118 the data with multi resolution levels.

NOTE Confidence: 0.927383925882353

01:32:01.120 --> 01:32:02.870 So what that means is when you're

NOTE Confidence: 0.927383925882353

01:32:02.870 --> 01:32:04.279 visualizing a really big data set,

NOTE Confidence: 0.927383925882353

01:32:04.280 --> 01:32:05.600 I don't know if I have one here,

NOTE Confidence: 0.927383925882353

01:32:05.600 --> 01:32:07.280 but if you're visualizing a really

NOTE Confidence: 0.927383925882353

01:32:07.280 --> 01:32:09.640 big data set, as you're zooming in,

NOTE Confidence: 0.927383925882353

01:32:09.640 --> 01:32:10.908 you're only, you know,

NOTE Confidence: 0.927383925882353

01:32:10.908 --> 01:32:12.432 basically you can kind of see

NOTE Confidence: 0.927383925882353

01:32:12.432 --> 01:32:14.357 it in this image a little bit.

NOTE Confidence: 0.927383925882353

01:32:14.360 --> 01:32:17.530 If I turn on the image here and I look

NOTE Confidence: 0.927383925882353

01:32:17.622 --> 01:32:20.116 at it at kind of a low resolution,

NOTE Confidence: 0.927383925882353

01:32:20.120 --> 01:32:21.919 you can kind of see the data,

NOTE Confidence: 0.927383925882353

01:32:21.920 --> 01:32:24.398 but in here it looks pretty dark.

NOTE Confidence: 0.927383925882353

01:32:24.400 --> 01:32:25.440 That's because the pixels that

NOTE Confidence: 0.927383925882353

01:32:25.440 --> 01:32:26.272 you're looking at there,

NOTE Confidence: 0.927383925882353

01:32:26.280 --> 01:32:27.280 you can't see them yet.

NOTE Confidence: 0.890246886

01:32:27.280 --> 01:32:28.576 They're so small based on the

NOTE Confidence: 0.890246886

01:32:28.576 --> 01:32:29.680 pixels on your screen, right,

NOTE Confidence: 0.890246886

01:32:29.680 --> 01:32:30.880 your pixels on your monitor,

NOTE Confidence: 0.890246886

01:32:30.880 --> 01:32:32.500 whether it's a high resolution

NOTE Confidence: 0.890246886

01:32:32.500 --> 01:32:34.120 monitor or low resolution monitor.

NOTE Confidence: 0.890246886

01:32:34.120 --> 01:32:34.996 As you zoom in,

NOTE Confidence: 0.890246886

01:32:34.996 --> 01:32:36.624 you're not going to see those pixels

NOTE Confidence: 0.890246886

01:32:36.624 --> 01:32:38.430 until you get to a particular zoom

NOTE Confidence: 0.890246886

01:32:38.430 --> 01:32:40.098 level where the size of your pixel

NOTE Confidence: 0.890246886

01:32:40.098 --> 01:32:41.870 on the screen at least matches the

NOTE Confidence: 0.890246886

01:32:41.870 --> 01:32:44.034 size the pixel on your monitor, right.

NOTE Confidence: 0.890246886

01:32:44.034 --> 01:32:44.958 And so as I zoom in,

NOTE Confidence: 0.890246886

01:32:44.960 --> 01:32:45.752 you're going to see,

NOTE Confidence: 0.890246886

01:32:45.752 --> 01:32:47.400 I'm just going to do it stepwise.

NOTE Confidence: 0.890246886

01:32:47.400 --> 01:32:49.052 Some of those the noise kind of

NOTE Confidence: 0.890246886

01:32:49.052 --> 01:32:50.476 starts seeing it higher and higher

NOTE Confidence: 0.890246886

01:32:50.476 --> 01:32:52.319 as you do more and more and it's

NOTE Confidence: 0.890246886

01:32:52.319 --> 01:32:53.999 at some point you're not going to,

NOTE Confidence: 0.890246886

01:32:54.000 --> 01:32:55.015 it's not going to change much because

NOTE Confidence: 0.890246886

01:32:55.015 --> 01:32:56.200 you're at the highest resolution level,

NOTE Confidence: 0.890246886

01:32:56.200 --> 01:32:57.920 but we're visualizing just the

NOTE Confidence: 0.890246886

01:32:57.920 --> 01:32:59.640 resolution level that you can

NOTE Confidence: 0.890246886

01:32:59.706 --> 01:33:01.512 see at the zoom and the cameras

NOTE Confidence: 0.890246886

01:33:01.512 --> 01:33:03.040 room that you have within.

NOTE Confidence: 0.890246886

01:33:03.040 --> 01:33:03.782 But yes,

NOTE Confidence: 0.890246886

01:33:03.782 --> 01:33:05.920 it's a lot totally lossless creation.

NOTE Confidence: 0.890246886

01:33:05.920 --> 01:33:07.880 So don't you don't have to worry

NOTE Confidence: 0.890246886

01:33:07.880 --> 01:33:09.838 about any of any any loss of signal

NOTE Confidence: 0.668433854

01:33:14.240 --> 01:33:16.448 problem of video. Yeah.

NOTE Confidence: 0.668433854

01:33:16.448 --> 01:33:19.120 These these I think was earlier.

NOTE Confidence: 0.668433854

01:33:19.120 --> 01:33:20.996 Oh, with the OH with the video.

NOTE Confidence: 0.668433854

01:33:21.000 --> 01:33:22.680 OK All right. So, Caroline,

NOTE Confidence: 0.668433854

01:33:22.680 --> 01:33:24.520 you have another question here.

NOTE Confidence: 0.668433854

01:33:24.520 --> 01:33:26.680 What is the best way to import EM data?

NOTE Confidence: 0.668433854

01:33:26.680 --> 01:33:28.390 Do I need to invert it first so it's

NOTE Confidence: 0.668433854

01:33:28.390 --> 01:33:29.904 all black, contrast becomes white.

NOTE Confidence: 0.668433854

01:33:29.904 --> 01:33:31.872 So Mars sees it as fluorescence.

NOTE Confidence: 0.668433854

01:33:31.880 --> 01:33:35.120 So EM data is interesting.

NOTE Confidence: 0.668433854

01:33:35.120 --> 01:33:39.355 So EM data typically is not fluorescent

NOTE Confidence: 0.668433854

01:33:39.360 --> 01:33:40.800 depending on how you've acquired it.

NOTE Confidence: 0.668433854

01:33:40.800 --> 01:33:43.355 I've done EM way back in the

NOTE Confidence: 0.668433854

01:33:43.355 --> 01:33:45.795 past and converted our our images

NOTE Confidence: 0.668433854

01:33:45.795 --> 01:33:47.768 to a digital digital series.

NOTE Confidence: 0.668433854

01:33:47.768 --> 01:33:49.952 I did some EM serial sectioning

NOTE Confidence: 0.668433854

01:33:49.952 --> 01:33:51.280 back in the day.

NOTE Confidence: 0.668433854

01:33:51.280 --> 01:33:53.128 From what I remember,

NOTE Confidence: 0.668433854

01:33:53.128 --> 01:33:54.960 they were monochromatic images

NOTE Confidence: 0.668433854

01:33:54.960 --> 01:33:56.280 from the camera.

NOTE Confidence: 0.668433854

01:33:56.280 --> 01:33:57.600 They were not,

NOTE Confidence: 0.668433854

01:33:57.600 --> 01:33:58.560 they were not

NOTE Confidence: 0.736672613333333

01:34:01.320 --> 01:34:03.480 RGB images. So we just monochromatic.

NOTE Confidence: 0.822982195

01:34:05.800 --> 01:34:08.684 I would just keep it as a

NOTE Confidence: 0.822982195

01:34:08.684 --> 01:34:09.920 monochromatic TIFF probably.

NOTE Confidence: 0.822982195

01:34:09.920 --> 01:34:12.360 Now Mars does not do any alignment.

NOTE Confidence: 0.822982195

01:34:12.360 --> 01:34:15.440 So if you're looking like for serial

NOTE Confidence: 0.822982195

01:34:15.440 --> 01:34:17.599 sectioning and things like that,

NOTE Confidence: 0.822982195

01:34:17.600 --> 01:34:19.984 they they need to be automatically or already

NOTE Confidence: 0.822982195

01:34:19.984 --> 01:34:21.876 aligned before you bring them into Mars.

NOTE Confidence: 0.822982195

01:34:21.880 --> 01:34:22.840 We used to have a,

NOTE Confidence: 0.822982195

01:34:22.840 --> 01:34:24.198 we used to have an aligner way,

NOTE Confidence: 0.822982195

01:34:24.200 --> 01:34:25.360 way back in the day.

NOTE Confidence: 0.822982195

01:34:25.360 --> 01:34:26.998 They stopped developing it a while ago.

NOTE Confidence: 0.822982195

01:34:27.000 --> 01:34:28.120 They'd never kind of re

NOTE Confidence: 0.822982195

01:34:28.120 --> 01:34:29.240 implemented it as a tool.

NOTE Confidence: 0.822982195

01:34:29.240 --> 01:34:31.274 It might happen at some point in the future.

NOTE Confidence: 0.822982195

01:34:31.280 --> 01:34:32.588 Right now you'd have to go

NOTE Confidence: 0.822982195

01:34:32.588 --> 01:34:34.160 somewhere else to do the alignment.

NOTE Confidence: 0.822982195

01:34:34.160 --> 01:34:35.840 Fiji has a couple great tools.

NOTE Confidence: 0.822982195

01:34:35.840 --> 01:34:37.079 I'm sure there's other tools out there,

NOTE Confidence: 0.822982195

01:34:37.080 --> 01:34:39.635 maybe with how you acquired the data,

NOTE Confidence: 0.822982195

01:34:39.640 --> 01:34:40.360 but I think

NOTE Confidence: 0.8972307225

01:34:43.320 --> 01:34:46.840 I mean if you want to invert it, you can.

NOTE Confidence: 0.8972307225

01:34:46.840 --> 01:34:49.805 But usually it's a monochromatic

NOTE Confidence: 0.8972307225

01:34:49.805 --> 01:34:51.840 image with black. You know,

NOTE Confidence: 0.8972307225

01:34:51.840 --> 01:34:54.000 kind of a grayscale grayscale image.

NOTE Confidence: 0.8972307225

01:34:54.000 --> 01:34:55.768 You can still use that grayscale image and

NOTE Confidence: 0.8972307225

01:34:55.768 --> 01:34:57.756 use the machine learning and and train it.

NOTE Confidence: 0.8972307225

01:34:57.760 --> 01:34:58.831 That's definitely doable.

NOTE Confidence: 0.8972307225

01:34:58.831 --> 01:35:01.330 I've done it on a couple occasions

NOTE Confidence: 0.8972307225

01:35:01.390 --> 01:35:03.604 where you can use that pixel

NOTE Confidence: 0.8972307225

01:35:03.604 --> 01:35:05.496 classification to do segmentation for

NOTE Confidence: 0.8972307225

01:35:05.496 --> 01:35:08.824 EM data or you can do some contour

NOTE Confidence: 0.8972307225

01:35:08.824 --> 01:35:11.316 tracing to create surfaces on EM data.

NOTE Confidence: 0.8972307225

01:35:11.320 --> 01:35:13.560 I didn't go into the contour tracing tool.

NOTE Confidence: 0.8972307225

01:35:13.560 --> 01:35:14.790 If you are interested in something

NOTE Confidence: 0.8972307225

01:35:14.790 --> 01:35:15.880 like that reach out to me.

NOTE Confidence: 0.8972307225

01:35:15.880 --> 01:35:17.357 I have a video tutorial I can

NOTE Confidence: 0.8972307225

01:35:17.357 --> 01:35:19.000 send you about how to do contour

NOTE Confidence: 0.8972307225

01:35:19.000 --> 01:35:20.200 tracing inside of a Morris,

NOTE Confidence: 0.8972307225

01:35:20.200 --> 01:35:22.251 but that's a very hands on slice

NOTE Confidence: 0.8972307225

01:35:22.251 --> 01:35:24.347 by slice kind of tracing of your

NOTE Confidence: 0.8972307225

01:35:24.347 --> 01:35:26.434 data and then it creates a 3D

NOTE Confidence: 0.8972307225

01:35:26.434 --> 01:35:28.234 volume based on based on that.

NOTE Confidence: 0.897930747142857

01:35:31.480 --> 01:35:32.866 What does the smooth function actually

NOTE Confidence: 0.897930747142857

01:35:32.866 --> 01:35:34.799 do the data to make it look smoother?

NOTE Confidence: 0.897930747142857

01:35:34.800 --> 01:35:37.580 It's a Gaussian filter as I said when I was

NOTE Confidence: 0.897930747142857

01:35:37.654 --> 01:35:40.680 trying to present you earlier. When you do,

NOTE Confidence: 0.939840101428571

01:35:43.440 --> 01:35:46.520 when you do the smoothing step here,

NOTE Confidence: 0.939840101428571

01:35:46.520 --> 01:35:49.440 if you look in. Also just a rule of thumb,

NOTE Confidence: 0.939840101428571

01:35:49.440 --> 01:35:50.928 if you ever have a question on anything

NOTE Confidence: 0.939840101428571

01:35:50.928 --> 01:35:52.624 in a Morris and you don't want to

NOTE Confidence: 0.939840101428571

01:35:52.624 --> 01:35:54.142 call support and your tech people or

NOTE Confidence: 0.939840101428571

01:35:54.142 --> 01:35:55.598 people in your lab are not around,

NOTE Confidence: 0.939840101428571

01:35:55.600 --> 01:35:57.520 that can't help you and you

NOTE Confidence: 0.939840101428571

01:35:57.520 --> 01:35:59.200 can't reach me right away.

NOTE Confidence: 0.939840101428571

01:35:59.200 --> 01:36:00.270 Usually calling me is not

NOTE Confidence: 0.939840101428571

01:36:00.270 --> 01:36:01.520 the best way to contact me.

NOTE Confidence: 0.939840101428571

01:36:01.520 --> 01:36:02.480 Usually by e-mail is the

NOTE Confidence: 0.939840101428571

01:36:02.480 --> 01:36:03.440 best way to contact me.

NOTE Confidence: 0.939840101428571

01:36:03.440 --> 01:36:03.944 So I'm not,

NOTE Confidence: 0.939840101428571

01:36:03.944 --> 01:36:05.120 I'm not someone that's going to be

NOTE Confidence: 0.939840101428571

01:36:05.162 --> 01:36:06.520 able to answer the phone when you're

NOTE Confidence: 0.939840101428571

01:36:06.520 --> 01:36:07.798 sitting in front of the microscope,

NOTE Confidence: 0.939840101428571

01:36:07.800 --> 01:36:09.000 very often much in front

NOTE Confidence: 0.939840101428571

01:36:09.000 --> 01:36:09.960 of the imaging computer.

NOTE Confidence: 0.939840101428571

01:36:09.960 --> 01:36:11.749 So a lot of times you want to try to find

NOTE Confidence: 0.939840101428571

01:36:11.749 --> 01:36:13.517 the answer yourself and send me an e-mail.

NOTE Confidence: 0.939840101428571

01:36:13.520 --> 01:36:15.319 But a lot of times in Amaris,

NOTE Confidence: 0.939840101428571

01:36:15.320 --> 01:36:16.800 all the Wizards in Amaris,

NOTE Confidence: 0.939840101428571

01:36:16.800 --> 01:36:17.568 hopefully everywhere.

NOTE Confidence: 0.939840101428571

01:36:17.568 --> 01:36:19.400 Most of us, if you find an error,

NOTE Confidence: 0.939840101428571

01:36:19.400 --> 01:36:20.021 let me know.

NOTE Confidence: 0.939840101428571

01:36:20.021 --> 01:36:21.959 But if you right click on anywhere in Amaris,

NOTE Confidence: 0.939840101428571

01:36:21.960 --> 01:36:22.680 like for example,

NOTE Confidence: 0.939840101428571

01:36:22.680 --> 01:36:24.120 if I right click right here

NOTE Confidence: 0.939840101428571

01:36:24.120 --> 01:36:25.760 on Smooth and I hit show help,

NOTE Confidence: 0.939840101428571

01:36:25.760 --> 01:36:30.680 it's going to open up our HTML

NOTE Confidence: 0.939840101428571

01:36:30.680 --> 01:36:32.040 manual and it'll show you.

NOTE Confidence: 0.939840101428571

01:36:32.040 --> 01:36:34.231 So right here it'll tell you exactly

NOTE Confidence: 0.939840101428571

01:36:34.231 --> 01:36:35.919 what the smoothing factor does.

NOTE Confidence: 0.939840101428571

01:36:35.920 --> 01:36:37.840 It's basically a Gaussian filter.

NOTE Confidence: 0.939840101428571

01:36:37.840 --> 01:36:39.676 That's all it is but anywhere.

NOTE Confidence: 0.939840101428571

01:36:39.680 --> 01:36:40.658 Tomorrow if you can click on

NOTE Confidence: 0.939840101428571

01:36:40.658 --> 01:36:42.021 here to get what that is and it

NOTE Confidence: 0.939840101428571

01:36:42.021 --> 01:36:43.023 even tells you exactly what the

NOTE Confidence: 0.939840101428571

01:36:43.062 --> 01:36:44.079 background subtraction does.

NOTE Confidence: 0.939840101428571

01:36:44.080 --> 01:36:45.529 So you can have a if you want to

NOTE Confidence: 0.939840101428571

01:36:45.529 --> 01:36:46.900 try to write up a methods back

NOTE Confidence: 0.939840101428571

01:36:46.900 --> 01:36:48.207 paper or kind of tell somebody

NOTE Confidence: 0.939840101428571

01:36:48.207 --> 01:36:49.915 what you how you process your data.

NOTE Confidence: 0.939840101428571

01:36:49.920 --> 01:36:52.496 It tells you exactly what what these

NOTE Confidence: 0.939840101428571

01:36:52.496 --> 01:36:56.400 processes do within within the software.

NOTE Confidence: 0.939840101428571

01:36:56.400 --> 01:37:01.195 OK, so can this training be

NOTE Confidence: 0.939840101428571

01:37:01.195 --> 01:37:03.239 applied to multiple images?

NOTE Confidence: 0.939840101428571

01:37:03.240 --> 01:37:05.040 I assume you're talking about

NOTE Confidence: 0.939840101428571

01:37:05.040 --> 01:37:06.120 the pixel classification.

NOTE Confidence: 0.939840101428571

01:37:06.120 --> 01:37:07.520 So that's a great question.

NOTE Confidence: 0.939840101428571

01:37:07.520 --> 01:37:08.636 I didn't really get into that.

NOTE Confidence: 0.939840101428571

01:37:08.640 --> 01:37:09.232 And again,

NOTE Confidence: 0.939840101428571

01:37:09.232 --> 01:37:10.120 I'm going to,

NOTE Confidence: 0.939840101428571

01:37:10.120 --> 01:37:11.785 there are some video tutorials

NOTE Confidence: 0.939840101428571

01:37:11.785 --> 01:37:13.450 available about kind of best

NOTE Confidence: 0.939840101428571

01:37:13.515 --> 01:37:14.963 practices for doing pixel

NOTE Confidence: 0.939840101428571

01:37:14.963 --> 01:37:16.773 classification and we are building

NOTE Confidence: 0.939840101428571

01:37:16.773 --> 01:37:18.717 our library of tools out there.

NOTE Confidence: 0.939840101428571

01:37:18.720 --> 01:37:20.680 There's a bunch of tools out there.

NOTE Confidence: 0.939840101428571

01:37:20.680 --> 01:37:22.920 Just to show you real quick here,

NOTE Confidence: 0.939840101428571

01:37:22.920 --> 01:37:25.638 there is a tool here called the Mars Bites.

NOTE Confidence: 0.939840101428571

01:37:25.640 --> 01:37:27.680 It's kind of developed by

NOTE Confidence: 0.739666494285714

01:37:30.640 --> 01:37:32.915 Mars Bites. This is a YouTube page,

NOTE Confidence: 0.739666494285714

01:37:32.920 --> 01:37:34.880 so if you search Mars Bites on YouTube,

NOTE Confidence: 0.739666494285714

01:37:34.880 --> 01:37:37.520 there are right now 30 videos,

NOTE Confidence: 0.739666494285714

01:37:37.520 --> 01:37:38.438 short little videos,

NOTE Confidence: 0.739666494285714

01:37:38.438 --> 01:37:40.274 all about 5 to 6 minutes,

NOTE Confidence: 0.739666494285714

01:37:40.280 --> 01:37:42.320 7 minutes long, some shorter,

NOTE Confidence: 0.739666494285714

01:37:42.320 --> 01:37:44.016 doing all different various

NOTE Confidence: 0.739666494285714

01:37:44.016 --> 01:37:46.560 small little features of a Mars.

NOTE Confidence: 0.739666494285714

01:37:46.560 --> 01:37:48.441 A lot of the stuff I didn't even cover

NOTE Confidence: 0.739666494285714

01:37:48.441 --> 01:37:50.357 today because they're they're not really.

NOTE Confidence: 0.739666494285714

01:37:50.360 --> 01:37:52.838 They're more kind of offhand type things,

NOTE Confidence: 0.739666494285714

01:37:52.840 --> 01:37:53.925 you know, adding a surface

NOTE Confidence: 0.739666494285714

01:37:53.925 --> 01:37:55.640 with the magic wand, Z series,

NOTE Confidence: 0.739666494285714

01:37:55.640 --> 01:37:57.320 animation, labels and vantage.

NOTE Confidence: 0.739666494285714

01:37:57.320 --> 01:37:58.304 There's a lot of different things

NOTE Confidence: 0.739666494285714

01:37:58.304 --> 01:37:59.120 that are here that you.

NOTE Confidence: 0.739666494285714

01:37:59.120 --> 01:38:00.359 Oh yeah, look, that might be interesting.

NOTE Confidence: 0.739666494285714

01:38:00.360 --> 01:38:02.000 I'm going to watch that short little videos,

NOTE Confidence: 0.739666494285714

01:38:02.000 --> 01:38:03.836 nice little resource for you to go in here.

NOTE Confidence: 0.666827957

01:38:06.080 --> 01:38:07.352 I'm sorry, what was the last

NOTE Confidence: 0.666827957

01:38:07.352 --> 01:38:08.200 question on the question?

NOTE Confidence: 0.666827957

01:38:08.200 --> 01:38:10.088 Oh, for multiple trainings.

NOTE Confidence: 0.666827957

01:38:10.088 --> 01:38:13.440 So when you train your data sets,

NOTE Confidence: 0.666827957

01:38:13.440 --> 01:38:14.696 typically the pixel classification,

NOTE Confidence: 0.666827957

01:38:14.696 --> 01:38:17.200 if I come up on here and I say,

NOTE Confidence: 0.666827957

01:38:17.200 --> 01:38:18.680 hey, I'm going to,

NOTE Confidence: 0.726457518333333

01:38:21.480 --> 01:38:22.236 I'm going to just do it,

NOTE Confidence: 0.726457518333333

01:38:22.240 --> 01:38:23.410 I'm going to do it on one of these data

NOTE Confidence: 0.726457518333333

01:38:23.445 --> 01:38:24.677 sets because these are all the same size,

NOTE Confidence: 0.726457518333333

01:38:24.680 --> 01:38:27.576 I think. No, no, they're not.

NOTE Confidence: 0.726457518333333

01:38:27.576 --> 01:38:29.558 So the idea here is like this is a,

NOTE Confidence: 0.726457518333333

01:38:29.560 --> 01:38:31.128 this is a control data set, right?

NOTE Confidence: 0.726457518333333

01:38:31.128 --> 01:38:32.898 This is a three, three data sets.

NOTE Confidence: 0.726457518333333

01:38:32.898 --> 01:38:35.330 Let's just say I want to do my

NOTE Confidence: 0.726457518333333

01:38:35.330 --> 01:38:36.128 pixel classification training

NOTE Confidence: 0.726457518333333

01:38:36.128 --> 01:38:37.940 on one of these files, right.

NOTE Confidence: 0.726457518333333

01:38:37.940 --> 01:38:41.680 I might open this file up here and say,

NOTE Confidence: 0.726457518333333

01:38:41.680 --> 01:38:42.720 hey, I want to,

NOTE Confidence: 0.726457518333333

01:38:42.720 --> 01:38:44.358 I want to train my pixel classification.

NOTE Confidence: 0.726457518333333

01:38:44.360 --> 01:38:45.716 I'm going to come in here,

NOTE Confidence: 0.726457518333333

01:38:45.720 --> 01:38:47.568 I'm going to go and make

NOTE Confidence: 0.726457518333333

01:38:47.568 --> 01:38:48.680 these machine learning.

NOTE Confidence: 0.726457518333333

01:38:48.680 --> 01:38:51.480 I'm going to train the green channel.

NOTE Confidence: 0.726457518333333

01:38:51.480 --> 01:38:52.920 Come in, here I go.

NOTE Confidence: 0.726457518333333

01:38:52.920 --> 01:38:54.432 You know I'm not going to do this

NOTE Confidence: 0.726457518333333

01:38:54.432 --> 01:38:56.036 very good here to background and I do

NOTE Confidence: 0.6177317475

01:38:58.800 --> 01:38:59.400 foreground or whatever.

NOTE Confidence: 0.6177317475

01:38:59.400 --> 01:39:00.553 And you train and predict, right?

NOTE Confidence: 0.6177317475

01:39:00.553 --> 01:39:01.318 And you get a result.

NOTE Confidence: 0.6177317475

01:39:01.320 --> 01:39:03.705 You're going to get some sort of some

NOTE Confidence: 0.6177317475

01:39:03.705 --> 01:39:05.840 sort of training of that data set.

NOTE Confidence: 0.6177317475

01:39:05.840 --> 01:39:08.234 I can save that training and I can apply

NOTE Confidence: 0.6177317475

01:39:08.234 --> 01:39:10.520 that exact training to multiple files.

NOTE Confidence: 0.6177317475

01:39:10.520 --> 01:39:11.520 I can. Like I said,

NOTE Confidence: 0.6177317475

01:39:11.520 --> 01:39:13.239 if I if I finish this training and say,

NOTE Confidence: 0.6177317475

01:39:13.240 --> 01:39:15.248 hey, I want to save this training here

NOTE Confidence: 0.6177317475

01:39:15.248 --> 01:39:17.518 and I do store parameters for batch,

NOTE Confidence: 0.6177317475

01:39:17.520 --> 01:39:20.568 I can call this green with pixel

NOTE Confidence: 0.6177317475

01:39:20.568 --> 01:39:22.320 classification whatever, right?

NOTE Confidence: 0.6177317475

01:39:22.320 --> 01:39:24.760 And so now I can go. I can,

NOTE Confidence: 0.6177317475

01:39:24.760 --> 01:39:29.599 I can go here and open up another data set.

NOTE Confidence: 0.6177317475

01:39:29.600 --> 01:39:31.908 Right. Come up here.

NOTE Confidence: 0.6177317475

01:39:31.908 --> 01:39:34.216 There's a favorite creation

NOTE Confidence: 0.6177317475

01:39:34.216 --> 01:39:36.278 parameters here I can do,

NOTE Confidence: 0.6177317475

01:39:36.280 --> 01:39:37.078 oh, what did I call it?

NOTE Confidence: 0.658885128

01:39:41.560 --> 01:39:43.128 Green with fixed classification.

NOTE Confidence: 0.658885128

01:39:43.128 --> 01:39:44.256 Right. Hit next.

NOTE Confidence: 0.658885128

01:39:44.256 --> 01:39:47.200 It's going to use the same exact training.

NOTE Confidence: 0.658885128

01:39:47.200 --> 01:39:48.520 The data is exactly the same.

NOTE Confidence: 0.658885128

01:39:48.520 --> 01:39:49.656 It has to be from this, you know,

NOTE Confidence: 0.658885128

01:39:49.656 --> 01:39:51.112 Everything has to be exactly the same.

NOTE Confidence: 0.658885128

01:39:51.120 --> 01:39:52.884 But now you have your surface creation

NOTE Confidence: 0.658885128

01:39:52.884 --> 01:39:54.746 is the same exact classification in

NOTE Confidence: 0.658885128

01:39:54.746 --> 01:39:56.374 that particular data set, right?

NOTE Confidence: 0.658885128

01:39:56.374 --> 01:39:56.802 Same exact.

NOTE Confidence: 0.658885128

01:39:56.802 --> 01:39:58.879 You can do this as many times as you want.

NOTE Confidence: 0.658885128

01:39:58.880 --> 01:40:00.518 You can even do this in a batch processing.

NOTE Confidence: 0.658885128

01:40:00.520 --> 01:40:01.678 If you have the batch module,

NOTE Confidence: 0.658885128

01:40:01.680 --> 01:40:02.877 you can go into the batch module.

NOTE Confidence: 0.658885128

01:40:02.880 --> 01:40:05.586 Now I didn't go into the batch module again.

NOTE Confidence: 0.658885128

01:40:05.586 --> 01:40:06.916 If you're interested in kind

NOTE Confidence: 0.658885128

01:40:06.916 --> 01:40:08.664 of being able to kind of do,

NOTE Confidence: 0.658885128

01:40:08.664 --> 01:40:11.040 you can set these parameters on a on a,

NOTE Confidence: 0.658885128

01:40:11.040 --> 01:40:13.056 set it and go kind of scenario where

NOTE Confidence: 0.658885128

01:40:13.056 --> 01:40:15.160 they're all very similar and the same

NOTE Confidence: 0.658885128

01:40:15.160 --> 01:40:17.200 exact parameters work well, then batch.

NOTE Confidence: 0.658885128

01:40:17.200 --> 01:40:19.600 Might be an option for you.

NOTE Confidence: 0.658885128

01:40:19.600 --> 01:40:21.157 I'm I'm a fan of kind of doing it

NOTE Confidence: 0.658885128

01:40:21.157 --> 01:40:22.787 one at a time and and making sure

NOTE Confidence: 0.658885128

01:40:22.787 --> 01:40:24.208 that it works well on these data

NOTE Confidence: 0.658885128

01:40:24.208 --> 01:40:26.128 sets before I go on to the next one.

NOTE Confidence: 0.658885128

01:40:26.128 --> 01:40:26.640 But again,

NOTE Confidence: 0.658885128

01:40:26.640 --> 01:40:28.929 batch processing here is kind of reusing

NOTE Confidence: 0.658885128

01:40:28.929 --> 01:40:30.991 the same parameters on this image and

NOTE Confidence: 0.658885128

01:40:30.991 --> 01:40:33.239 then you can kind of validate that result.

NOTE Confidence: 0.658885128

01:40:33.240 --> 01:40:36.324 Now one of the things that people will say is

NOTE Confidence: 0.658885128

01:40:36.324 --> 01:40:38.280 that I don't want to train on just one image,

NOTE Confidence: 0.658885128

01:40:38.280 --> 01:40:40.395 I want to do the training on multiple images.

NOTE Confidence: 0.658885128

01:40:40.400 --> 01:40:41.520 You can do that right?

NOTE Confidence: 0.658885128

01:40:41.520 --> 01:40:43.320 So if I trained it on that image

NOTE Confidence: 0.658885128

01:40:43.320 --> 01:40:45.004 and I open up this one, right.

NOTE Confidence: 0.658885128

01:40:45.004 --> 01:40:46.480 And I come up here and I was like,

NOTE Confidence: 0.658885128

01:40:46.480 --> 01:40:47.479 you know what?

NOTE Confidence: 0.658885128

01:40:47.479 --> 01:40:50.016 I'm going to use that green training,

NOTE Confidence: 0.658885128

01:40:50.016 --> 01:40:52.395 green cells with PC, right?

NOTE Confidence: 0.658885128

01:40:52.395 --> 01:40:54.275 I come up here and I do this.

NOTE Confidence: 0.658885128

01:40:54.280 --> 01:40:55.880 You see where it says keep training data.

NOTE Confidence: 0.658885128

01:40:55.880 --> 01:40:57.798 It's going to keep the training data.

NOTE Confidence: 0.658885128

01:40:57.800 --> 01:40:58.997 But I can come up here and I can

NOTE Confidence: 0.658885128

01:40:58.997 --> 01:41:00.120 look at this image and say, oh,

NOTE Confidence: 0.658885128

01:41:00.120 --> 01:41:01.400 you, you can look at this and say,

NOTE Confidence: 0.658885128

01:41:01.400 --> 01:41:02.136 oh, wow, that's terrible.

NOTE Confidence: 0.658885128

01:41:02.136 --> 01:41:03.240 I want to come up here.

NOTE Confidence: 0.658885128

01:41:03.240 --> 01:41:04.920 This is, I need to train this better.

NOTE Confidence: 0.658885128

01:41:04.920 --> 01:41:05.628 On this particular image,

NOTE Confidence: 0.658885128

01:41:05.628 --> 01:41:06.513 it didn't work real well.

NOTE Confidence: 0.658885128

01:41:06.520 --> 01:41:08.257 I can come up here and train some of

NOTE Confidence: 0.658885128

01:41:08.257 --> 01:41:10.119 these structures here and and retrain it.

NOTE Confidence: 0.658885128

01:41:10.120 --> 01:41:11.270 That's going to build on

NOTE Confidence: 0.658885128

01:41:11.270 --> 01:41:11.960 that existing training.

NOTE Confidence: 0.658885128

01:41:11.960 --> 01:41:13.276 So it's going to take the training.

NOTE Confidence: 0.658885128

01:41:13.280 --> 01:41:14.600 I did it on image #1,

NOTE Confidence: 0.658885128

01:41:14.600 --> 01:41:16.800 it's going to modify it on image #2,

NOTE Confidence: 0.658885128

01:41:16.800 --> 01:41:18.543 and so now I have a new

NOTE Confidence: 0.658885128

01:41:18.543 --> 01:41:19.879 surface creation on image #2.

NOTE Confidence: 0.658885128

01:41:19.880 --> 01:41:22.120 I finished this process right?

NOTE Confidence: 0.658885128

01:41:22.120 --> 01:41:24.976 And then I can come in here

NOTE Confidence: 0.658885128

01:41:24.976 --> 01:41:26.536 and say pixel classification.

NOTE Confidence: 0.658885128

01:41:26.536 --> 01:41:29.112 I can save and I'm going to

NOTE Confidence: 0.658885128

01:41:29.112 --> 01:41:33.510 say green with PC I just,

NOTE Confidence: 0.658885128

01:41:33.510 --> 01:41:34.560 I just like saving for two.

NOTE Confidence: 0.658885128

01:41:34.560 --> 01:41:36.660 Sometimes I say now that's

NOTE Confidence: 0.658885128

01:41:36.660 --> 01:41:37.860 second second round, right?

NOTE Confidence: 0.658885128

01:41:37.860 --> 01:41:39.680 So now I've trained it on one,

NOTE Confidence: 0.658885128

01:41:39.680 --> 01:41:42.116 I applied it to a second one.

NOTE Confidence: 0.658885128

01:41:42.120 --> 01:41:43.440 Doesn't quite work as well,

NOTE Confidence: 0.658885128

01:41:43.440 --> 01:41:44.997 but I'm going to train it on that one.

NOTE Confidence: 0.658885128

01:41:45.000 --> 01:41:46.520 Now I have this,

NOTE Confidence: 0.658885128

01:41:46.520 --> 01:41:47.280 this second,

NOTE Confidence: 0.658885128

01:41:47.280 --> 01:41:49.614 this kind of merged creation parameter

NOTE Confidence: 0.658885128

01:41:49.614 --> 01:41:52.319 that's based on two separate images,

NOTE Confidence: 0.658885128

01:41:52.320 --> 01:41:54.480 but it's done separately and I'm not a huge,

NOTE Confidence: 0.96172878

01:41:54.480 --> 01:41:55.800 big fan of that. Typically,

NOTE Confidence: 0.96172878

01:41:55.800 --> 01:41:58.678 what I would like to do to do proper

NOTE Confidence: 0.96172878

01:41:58.678 --> 01:42:01.230 training data set is to kind of merge

NOTE Confidence: 0.96172878

01:42:01.230 --> 01:42:02.960 these files together into one file.

NOTE Confidence: 0.96172878

01:42:02.960 --> 01:42:04.360 Now there's a couple different ways to

NOTE Confidence: 0.96172878

01:42:04.360 --> 01:42:06.560 do that. One is to do it in a time to

NOTE Confidence: 0.96172878

01:42:06.560 --> 01:42:08.680 make yourself a fake time lapse and

NOTE Confidence: 0.96172878

01:42:08.680 --> 01:42:11.076 then train this data set one at a time.

NOTE Confidence: 0.96172878

01:42:11.080 --> 01:42:12.439 Now I was hoping that you'd kind of build

NOTE Confidence: 0.96172878

01:42:12.439 --> 01:42:13.874 this into the software a little bit better,

NOTE Confidence: 0.96172878

01:42:13.880 --> 01:42:15.364 but they haven't quite done that yet

NOTE Confidence: 0.96172878

01:42:15.364 --> 01:42:17.320 because it's brand, brand spanking new.

NOTE Confidence: 0.96172878

01:42:17.320 --> 01:42:20.388 And so the idea is you want to be

NOTE Confidence: 0.96172878

01:42:20.388 --> 01:42:22.240 able to have a time lapse data set.

NOTE Confidence: 0.96172878

01:42:22.240 --> 01:42:23.640 So, but to do that they have

NOTE Confidence: 0.96172878

01:42:23.640 --> 01:42:24.958 to be exactly the same size.

NOTE Confidence: 0.96172878

01:42:24.960 --> 01:42:27.700 Unfortunately, these guys here,

NOTE Confidence: 0.96172878

01:42:27.700 --> 01:42:30.612 358 by three, 49356 by three,

NOTE Confidence: 0.96172878

01:42:30.612 --> 01:42:32.316 they're not exactly the same sizes,

NOTE Confidence: 0.96172878

01:42:32.320 --> 01:42:33.867 so we can't add them through time

NOTE Confidence: 0.96172878

01:42:33.867 --> 01:42:34.800 because they're different sizes.

NOTE Confidence: 0.96172878

01:42:34.800 --> 01:42:35.960 That's not always the case.

NOTE Confidence: 0.96172878

01:42:35.960 --> 01:42:38.600 Sometimes two data are exactly the same size,

NOTE Confidence: 0.96172878

01:42:38.600 --> 01:42:41.198 1024 by 1024, blah blah blah,

NOTE Confidence: 0.96172878

01:42:41.200 --> 01:42:43.040 and 10 and 20 slices,

NOTE Confidence: 0.96172878

01:42:43.040 --> 01:42:45.200 but they're also different Z slices as well.

NOTE Confidence: 0.96172878

01:42:45.200 --> 01:42:47.920 So what I typically would do in a

NOTE Confidence: 0.96172878

01:42:47.920 --> 01:42:49.760 case like this, and I want to say,

NOTE Confidence: 0.96172878

01:42:49.760 --> 01:42:51.120 you know what, I have 10 data sets,

NOTE Confidence: 0.96172878

01:42:51.120 --> 01:42:52.728 but I want to train it on three

NOTE Confidence: 0.96172878

01:42:52.728 --> 01:42:53.400 different data sets.

NOTE Confidence: 0.96172878

01:42:53.400 --> 01:42:55.011 I don't want to just train it on one

NOTE Confidence: 0.96172878

01:42:55.011 --> 01:42:56.569 because there's a little bit of variation

NOTE Confidence: 0.96172878

01:42:56.569 --> 01:42:58.080 between one image and another image.

NOTE Confidence: 0.96172878

01:42:58.080 --> 01:43:01.473 So what I end up doing here is I would

NOTE Confidence: 0.96172878

01:43:01.473 --> 01:43:03.840 come up here and I'm just going to

NOTE Confidence: 0.96172878

01:43:03.840 --> 01:43:05.440 open up just the image here, right?

NOTE Confidence: 0.96172878

01:43:05.440 --> 01:43:07.203 So I have image #1, right?

NOTE Confidence: 0.96172878

01:43:07.203 --> 01:43:10.107 If I come up here and I do

NOTE Confidence: 0.96172878

01:43:10.107 --> 01:43:12.197 edit and I add slices,

NOTE Confidence: 0.96172878

01:43:12.200 --> 01:43:13.999 the size of the image doesn't matter.

NOTE Confidence: 0.96172878

01:43:14.000 --> 01:43:14.187 Well,

NOTE Confidence: 0.96172878

01:43:14.187 --> 01:43:15.122 actually it does matter because

NOTE Confidence: 0.96172878

01:43:15.122 --> 01:43:16.439 it has to be the same size.

NOTE Confidence: 0.96172878

01:43:16.440 --> 01:43:16.840 Shoot,

NOTE Confidence: 0.84675815

01:43:19.120 --> 01:43:20.038 OK, that's not going to work.

NOTE Confidence: 0.84675815

01:43:20.040 --> 01:43:22.998 Let me find a different example.

NOTE Confidence: 0.84675815

01:43:23.000 --> 01:43:24.400 Well, I'll just use this.

NOTE Confidence: 0.84675815

01:43:24.400 --> 01:43:26.560 I'll use the same file as an example.

NOTE Confidence: 0.84675815

01:43:26.560 --> 01:43:28.540 It still has to be the same XY dimensions

NOTE Confidence: 0.84675815

01:43:28.540 --> 01:43:30.517 to be able to do it this way as well.

NOTE Confidence: 0.84675815

01:43:30.520 --> 01:43:31.804 But the idea is that you're

NOTE Confidence: 0.84675815

01:43:31.804 --> 01:43:33.690 going to come up here, do edit,

NOTE Confidence: 0.84675815

01:43:33.690 --> 01:43:36.360 and you're going to either add time points.

NOTE Confidence: 0.84675815

01:43:36.360 --> 01:43:38.280 So if I do add time points here,

NOTE Confidence: 0.84675815

01:43:38.280 --> 01:43:41.154 and I take this image here and I add it,

NOTE Confidence: 0.84675815

01:43:41.154 --> 01:43:42.336 I'll have one time point here

NOTE Confidence: 0.84675815

01:43:42.336 --> 01:43:43.800 and I'll have another time point.

NOTE Confidence: 0.84675815

01:43:43.800 --> 01:43:44.942 Now it's the same time point, right?

NOTE Confidence: 0.84675815

01:43:44.942 --> 01:43:46.718 But you'll have one time .2 time points.

NOTE Confidence: 0.84675815

01:43:46.720 --> 01:43:48.795 And so when you create

NOTE Confidence: 0.84675815

01:43:48.795 --> 01:43:50.040 your creation parameters,

NOTE Confidence: 0.84675815

01:43:50.040 --> 01:43:51.456 you'll hit the blue tab and

NOTE Confidence: 0.84675815

01:43:51.456 --> 01:43:52.400 you can excuse me,

NOTE Confidence: 0.84675815

01:43:52.400 --> 01:43:54.960 you're going to train data on time .1,

NOTE Confidence: 0.84675815

01:43:54.960 --> 01:43:55.611 background and foreground.

NOTE Confidence: 0.84675815

01:43:55.611 --> 01:43:56.913 You're going to get time .2.

NOTE Confidence: 0.84675815

01:43:56.920 --> 01:43:58.185 You're going to train data

NOTE Confidence: 0.84675815

01:43:58.185 --> 01:43:59.197 time background and foreground.

NOTE Confidence: 0.84675815

01:43:59.200 --> 01:44:01.056 And you're going to optimize it on both

NOTE Confidence: 0.84675815

01:44:01.056 --> 01:44:02.690 until you're done and you're happy

NOTE Confidence: 0.84675815

01:44:02.690 --> 01:44:04.095 with the segmentation that's happening

NOTE Confidence: 0.84675815

01:44:04.095 --> 01:44:06.119 on both of those images at the same time.

NOTE Confidence: 0.84675815

01:44:06.120 --> 01:44:08.380 So that's one option.

NOTE Confidence: 0.84675815

01:44:08.380 --> 01:44:10.640 If they're the same,

NOTE Confidence: 0.84675815

01:44:10.640 --> 01:44:13.160 exactly the same size XY and Z,

NOTE Confidence: 0.84675815

01:44:13.160 --> 01:44:14.875 you can add them in time lapse.

NOTE Confidence: 0.84675815

01:44:14.880 --> 01:44:17.890 However, that's not always the case because

NOTE Confidence: 0.84675815

01:44:17.890 --> 01:44:21.720 a lot of times the ZS are different,

NOTE Confidence: 0.84675815

01:44:21.720 --> 01:44:22.760 X&X&Y is the same,

NOTE Confidence: 0.84675815

01:44:22.760 --> 01:44:24.080 there's still 1024 by 1024,

NOTE Confidence: 0.84675815

01:44:24.080 --> 01:44:25.480 but the ZS are different.

NOTE Confidence: 0.84675815

01:44:25.480 --> 01:44:26.920 So what I would do in a case like that,

NOTE Confidence: 0.84675815

01:44:26.920 --> 01:44:28.360 and it's a little bit counterintuitive,

NOTE Confidence: 0.84675815

01:44:28.360 --> 01:44:30.278 but I'm going to do add slices.

NOTE Confidence: 0.84675815

01:44:30.280 --> 01:44:32.002 So what that basically does is it

NOTE Confidence: 0.84675815

01:44:32.002 --> 01:44:33.760 all added on top of each other.

NOTE Confidence: 0.84675815

01:44:33.760 --> 01:44:36.060 So you'll get an image here and

NOTE Confidence: 0.84675815

01:44:36.060 --> 01:44:36.760 if I go into slice,

NOTE Confidence: 0.84675815

01:44:36.760 --> 01:44:38.020 you'll see it right?

NOTE Confidence: 0.84675815

01:44:38.020 --> 01:44:39.595 So here's your first image,

NOTE Confidence: 0.84675815

01:44:39.600 --> 01:44:40.638 and then as you go down,

NOTE Confidence: 0.84675815

01:44:40.640 --> 01:44:41.960 that image will disappear and then

NOTE Confidence: 0.84675815

01:44:41.960 --> 01:44:43.440 the second image will be at the top.

NOTE Confidence: 0.84675815

01:44:43.440 --> 01:44:45.840 And so the idea is that the pixel

NOTE Confidence: 0.84675815

01:44:45.840 --> 01:44:47.007 classification doesn't take into

NOTE Confidence: 0.84675815

01:44:47.007 --> 01:44:48.799 account the Z depth of the pixel,

NOTE Confidence: 0.84675815

01:44:48.800 --> 01:44:50.571 it just takes into account the pixels

NOTE Confidence: 0.84675815

01:44:50.571 --> 01:44:52.519 that are just surrounding that pixel.

NOTE Confidence: 0.84675815

01:44:52.520 --> 01:44:54.770 And so a lot of times you can do

NOTE Confidence: 0.84675815

01:44:54.770 --> 01:44:56.840 this trick by adding it in Z so

NOTE Confidence: 0.84675815

01:44:56.840 --> 01:44:59.080 that I can train pixels up here,

NOTE Confidence: 0.84675815

01:44:59.080 --> 01:45:00.280 train pixels down here,

NOTE Confidence: 0.84675815

01:45:00.280 --> 01:45:01.480 2 totally different images.

NOTE Confidence: 0.84675815

01:45:01.480 --> 01:45:03.200 And then when I save that creation parameter,

NOTE Confidence: 0.84675815

01:45:03.200 --> 01:45:04.780 it's based on two separate

NOTE Confidence: 0.84675815

01:45:04.780 --> 01:45:06.360 images within the data set.

NOTE Confidence: 0.84675815

01:45:06.360 --> 01:45:08.480 That's typically what I would end up doing.

NOTE Confidence: 0.84675815

01:45:08.480 --> 01:45:10.384 You can also crop your other data sets

NOTE Confidence: 0.84675815

01:45:10.384 --> 01:45:12.555 to fit so that they are the same size.

NOTE Confidence: 0.84675815

01:45:12.560 --> 01:45:13.596 Or if you know you're going to

NOTE Confidence: 0.84675815

01:45:13.596 --> 01:45:14.840 do it on a training data set,

NOTE Confidence: 0.84675815

01:45:14.840 --> 01:45:16.600 acquire data in a way that you can

NOTE Confidence: 0.84675815

01:45:16.600 --> 01:45:18.372 kind of import them in so that

NOTE Confidence: 0.84675815

01:45:18.372 --> 01:45:19.920 this is your training data set.

NOTE Confidence: 0.84675815

01:45:19.920 --> 01:45:20.916 Here's an image, here's an image.

NOTE Confidence: 0.84675815

01:45:20.920 --> 01:45:22.360 They're exactly the same size,

NOTE Confidence: 0.84675815

01:45:22.360 --> 01:45:23.361 and if you knew you're going to

NOTE Confidence: 0.84675815

01:45:23.361 --> 01:45:24.199 do this in the future,

NOTE Confidence: 0.84675815

01:45:24.200 --> 01:45:25.894 then you can kind of make sure

NOTE Confidence: 0.84675815

01:45:25.894 --> 01:45:26.960 that you take them,

NOTE Confidence: 0.84675815

01:45:26.960 --> 01:45:28.600 take these training data sets

NOTE Confidence: 0.84675815

01:45:28.600 --> 01:45:30.571 with the same size, same Z step,

NOTE Confidence: 0.84675815

01:45:30.571 --> 01:45:31.439 that sort of stuff.

NOTE Confidence: 0.786568101052631

01:45:31.440 --> 01:45:32.854 And that way when you go to

NOTE Confidence: 0.786568101052631

01:45:32.854 --> 01:45:34.134 import them together and make your

NOTE Confidence: 0.786568101052631

01:45:34.134 --> 01:45:35.394 time time lapse is the easiest,

NOTE Confidence: 0.786568101052631

01:45:35.400 --> 01:45:36.276 the best way to do it.

NOTE Confidence: 0.786568101052631

01:45:36.280 --> 01:45:38.438 So if you're taking a 10/24 or 10/24,

NOTE Confidence: 0.786568101052631

01:45:38.438 --> 01:45:40.760 just take them two or three images

NOTE Confidence: 0.786568101052631

01:45:40.760 --> 01:45:42.960 with exactly the same number of slices,

NOTE Confidence: 0.786568101052631

01:45:42.960 --> 01:45:44.633 add them together in that time lapse

NOTE Confidence: 0.786568101052631

01:45:44.633 --> 01:45:46.720 and then do the training on those data

NOTE Confidence: 0.786568101052631

01:45:46.720 --> 01:45:48.260 sets for all the remaining images

NOTE Confidence: 0.786568101052631

01:45:48.260 --> 01:45:49.800 that you have in your data set.

NOTE Confidence: 0.786568101052631

01:45:49.800 --> 01:45:51.342 So that's typically what I would

NOTE Confidence: 0.786568101052631

01:45:51.342 --> 01:45:52.999 do in a case like that.

NOTE Confidence: 0.786568101052631

01:45:53.000 --> 01:45:54.560 So hopefully that answers that question.

NOTE Confidence: 0.885363122

01:45:58.720 --> 01:46:00.300 Can you split volumes post

NOTE Confidence: 0.885363122

01:46:00.300 --> 01:46:01.880 processing after making a volume?

NOTE Confidence: 0.885363122

01:46:01.880 --> 01:46:03.390 If, for example, escalating C

NOTE Confidence: 0.885363122

01:46:03.390 --> 01:46:04.598 point isn't accurate enough,

NOTE Confidence: 0.84761447375

01:46:06.760 --> 01:46:10.320 The quick answer there is yes we can.

NOTE Confidence: 0.84761447375

01:46:10.320 --> 01:46:13.519 It is a very crude measure unfortunately,

NOTE Confidence: 0.84761447375

01:46:13.520 --> 01:46:15.570 so let me demonstrate that

NOTE Confidence: 0.84761447375

01:46:15.570 --> 01:46:18.639 really quickly here. I'll do it.

NOTE Confidence: 0.84761447375

01:46:18.640 --> 01:46:21.280 Let's do it on this page.

NOTE Confidence: 0.84761447375

01:46:21.280 --> 01:46:23.314 So the the tool for cutting

NOTE Confidence: 0.84761447375

01:46:23.314 --> 01:46:25.600 is a it's called a cut tool.

NOTE Confidence: 0.84761447375

01:46:25.600 --> 01:46:26.716 So if we look at Oops,

NOTE Confidence: 0.75570825

01:46:30.840 --> 01:46:32.280 oh wrong, oh wrong one, sorry.

NOTE Confidence: 0.87781406

01:46:38.000 --> 01:46:39.386 So the cutting is a very crude

NOTE Confidence: 0.87781406

01:46:39.386 --> 01:46:40.892 it's like taking a hatchet when you

NOTE Confidence: 0.87781406

01:46:40.892 --> 01:46:42.840 really need a scalpel, but it works

NOTE Confidence: 0.87781406

01:46:42.840 --> 01:46:45.000 depending on what you're doing here.

NOTE Confidence: 0.87781406

01:46:45.000 --> 01:46:48.800 So if I were to say, say I wanted to cut

NOTE Confidence: 0.87781406

01:46:48.800 --> 01:46:50.278 this little tip off that you know what,

NOTE Confidence: 0.87781406

01:46:50.280 --> 01:46:52.758 that's definitely not part of the cell.

NOTE Confidence: 0.87781406

01:46:52.760 --> 01:46:54.680 There is a pencil tool here

NOTE Confidence: 0.87781406

01:46:54.680 --> 01:46:56.600 and there's a cut surface,

NOTE Confidence: 0.87781406

01:46:56.600 --> 01:46:58.120 you know, scrolling over here.

NOTE Confidence: 0.87781406

01:46:58.120 --> 01:47:00.549 Hold down shift and left click and

NOTE Confidence: 0.87781406

01:47:00.549 --> 01:47:02.919 you'll see a little blue line.

NOTE Confidence: 0.87781406

01:47:02.920 --> 01:47:05.233 The blue line is always going to be vertical.

NOTE Confidence: 0.87781406

01:47:05.240 --> 01:47:06.440 As you place that blue line,

NOTE Confidence: 0.87781406

01:47:06.440 --> 01:47:07.600 it is always vertical.

NOTE Confidence: 0.87781406

01:47:07.600 --> 01:47:09.340 So you rotate your image appropriately

NOTE Confidence: 0.87781406

01:47:09.396 --> 01:47:11.160 and that line gets placed vertically.

NOTE Confidence: 0.87781406

01:47:11.160 --> 01:47:12.636 Can't change it any other way.

NOTE Confidence: 0.87781406

01:47:12.640 --> 01:47:14.838 But then you can click cut surface

NOTE Confidence: 0.87781406

01:47:14.840 --> 01:47:18.174 and then that surface there now is

NOTE Confidence: 0.87781406

01:47:18.174 --> 01:47:20.526 separate from this guy and you can take

NOTE Confidence: 0.87781406

01:47:20.526 --> 01:47:22.755 this guy and you can get rid of it.

NOTE Confidence: 0.87781406

01:47:22.760 --> 01:47:25.874 So it it it's a it's a good tool,

NOTE Confidence: 0.87781406

01:47:25.880 --> 01:47:27.080 it gets the job done,

NOTE Confidence: 0.87781406

01:47:27.080 --> 01:47:29.278 but it's not a very sensitive tool.

NOTE Confidence: 0.87781406

01:47:29.280 --> 01:47:32.040 And just be aware if you do use the cut tool,

NOTE Confidence: 0.87781406

01:47:32.040 --> 01:47:33.320 if I cut like this,

NOTE Confidence: 0.87781406

01:47:33.320 --> 01:47:35.095 you can see unfortunately it's

NOTE Confidence: 0.87781406

01:47:35.095 --> 01:47:37.440 not just cutting this one segment.

NOTE Confidence: 0.87781406

01:47:37.440 --> 01:47:39.080 The way they make their surfaces in a

NOTE Confidence: 0.87781406

01:47:39.080 --> 01:47:40.559 Morris and the way they changed it,

NOTE Confidence: 0.87781406

01:47:40.560 --> 01:47:42.444 it's going to cut every single

NOTE Confidence: 0.87781406

01:47:42.444 --> 01:47:44.320 part of that surface together.

NOTE Confidence: 0.87781406

01:47:44.320 --> 01:47:46.595 So if I did something like that,

NOTE Confidence: 0.87781406

01:47:46.600 --> 01:47:48.200 you'll see it's going to cut all those

NOTE Confidence: 0.87781406

01:47:48.200 --> 01:47:49.795 little pieces and I can visualize that here,

NOTE Confidence: 0.87781406

01:47:49.800 --> 01:47:50.680 just show this real quick.

NOTE Confidence: 0.87781406

01:47:50.680 --> 01:47:51.826 Here Object ID,

NOTE Confidence: 0.87781406

01:47:51.826 --> 01:47:54.118 you can see these these pieces

NOTE Confidence: 0.87781406

01:47:54.118 --> 01:47:56.797 are all cut now they're separate.

NOTE Confidence: 0.87781406

01:47:56.800 --> 01:47:58.784 You can go back and unify them later

NOTE Confidence: 0.87781406

01:47:58.784 --> 01:48:00.640 so that they're more connected.

NOTE Confidence: 0.87781406

01:48:00.640 --> 01:48:01.837 So like, oh, I cut this off,

NOTE Confidence: 0.87781406

01:48:01.840 --> 01:48:03.217 but this is the one I want to get

NOTE Confidence: 0.87781406

01:48:03.217 --> 01:48:03.919 rid of that one.

NOTE Confidence: 0.87781406

01:48:03.920 --> 01:48:05.675 But these guys here I still want to keep,

NOTE Confidence: 0.87781406

01:48:05.680 --> 01:48:07.200 if I hold down control and select that,

NOTE Confidence: 0.87781406

01:48:07.200 --> 01:48:09.080 go to the edit, there is a Unify.

NOTE Confidence: 0.87781406

01:48:09.080 --> 01:48:10.240 I can unify that back.

NOTE Confidence: 0.87781406

01:48:10.240 --> 01:48:11.661 It's not going to change the volume

NOTE Confidence: 0.87781406

01:48:11.661 --> 01:48:12.858 because we didn't change the volume

NOTE Confidence: 0.87781406

01:48:12.858 --> 01:48:14.280 when we cut it and just split it,

NOTE Confidence: 0.87781406

01:48:14.280 --> 01:48:15.240 You're going to get it back

NOTE Confidence: 0.87781406

01:48:15.240 --> 01:48:15.880 to the original size.

NOTE Confidence: 0.87781406

01:48:15.880 --> 01:48:16.576 But then I can,

NOTE Confidence: 0.87781406

01:48:16.576 --> 01:48:17.825 I can select this guy here and

NOTE Confidence: 0.87781406

01:48:17.825 --> 01:48:19.113 get rid of that corner if I want

NOTE Confidence: 0.87781406

01:48:19.113 --> 01:48:20.355 to just get rid of that guy.

NOTE Confidence: 0.87781406

01:48:20.360 --> 01:48:21.515 So a lot of different editing tools.

NOTE Confidence: 0.87781406

01:48:21.520 --> 01:48:22.878 Like I said, it's like a hatchet,

NOTE Confidence: 0.87781406

01:48:22.880 --> 01:48:24.760 but it it'll it'll work in a pinch.

NOTE Confidence: 0.87781406

01:48:24.760 --> 01:48:26.278 If it's a very complicated surface,

NOTE Confidence: 0.87781406

01:48:26.280 --> 01:48:27.680 it's not going to be very useful.

NOTE Confidence: 0.87781406

01:48:27.680 --> 01:48:28.760 But if it's a simple thing,

NOTE Confidence: 0.87781406

01:48:28.760 --> 01:48:30.227 you want to cut off a cell or split

NOTE Confidence: 0.87781406

01:48:30.227 --> 01:48:31.639 a cell that didn't get split,

NOTE Confidence: 0.87781406

01:48:31.640 --> 01:48:33.636 you can use this cut tool to

NOTE Confidence: 0.87781406

01:48:33.636 --> 01:48:36.012 typically get get the the result

NOTE Confidence: 0.87781406

01:48:36.012 --> 01:48:37.560 that you're looking for.

NOTE Confidence: 0.87781406

01:48:37.560 --> 01:48:41.571 The next question I think was about

NOTE Confidence: 0.87781406

01:48:41.571 --> 01:48:44.346 individual colors of the microglia.

NOTE Confidence: 0.87781406

01:48:44.346 --> 01:48:46.514 Short answer there is.

NOTE Confidence: 0.87781406

01:48:46.520 --> 01:48:51.852 I did object ID so every surface

NOTE Confidence: 0.87781406

01:48:51.852 --> 01:48:53.858 gets a random color so it gets an

NOTE Confidence: 0.87781406

01:48:53.858 --> 01:48:55.292 object ID so that's base color

NOTE Confidence: 0.87781406

01:48:55.292 --> 01:48:56.009 object ID so

NOTE Confidence: 0.794960793333333

01:48:56.066 --> 01:48:58.194 every object you'll get a separate color.

NOTE Confidence: 0.794960793333333

01:48:58.200 --> 01:49:00.280 That's that's all I did there for that.

NOTE Confidence: 0.794960793333333

01:49:00.280 --> 01:49:02.060 You can visualize these

NOTE Confidence: 0.794960793333333

01:49:02.060 --> 01:49:03.840 surfaces with statistics coding.

NOTE Confidence: 0.794960793333333

01:49:03.840 --> 01:49:04.920 You can do that as well.

NOTE Confidence: 0.794960793333333

01:49:04.920 --> 01:49:06.528 So for example, if I wanted to get

NOTE Confidence: 0.794960793333333

01:49:06.528 --> 01:49:07.958 it based show based on volume,

NOTE Confidence: 0.794960793333333

01:49:07.960 --> 01:49:11.160 you can get oops sorry,

NOTE Confidence: 0.794960793333333

01:49:11.160 --> 01:49:12.994 you can get it to look like

NOTE Confidence: 0.688624877

01:49:16.200 --> 01:49:17.460 spectrum. The ones that are

NOTE Confidence: 0.688624877

01:49:17.460 --> 01:49:18.720 red are my bigger guys,

NOTE Confidence: 0.688624877

01:49:18.720 --> 01:49:20.274 guys are purple or more smaller guys.

NOTE Confidence: 0.688624877

01:49:20.280 --> 01:49:21.996 Another way of visualizing the data,

NOTE Confidence: 0.688624877

01:49:22.000 --> 01:49:23.584 giving it, you know, giving some

NOTE Confidence: 0.688624877

01:49:23.584 --> 01:49:25.000 statistical context to your volume,

NOTE Confidence: 0.688624877

01:49:25.000 --> 01:49:25.688 sometimes that's a useful

NOTE Confidence: 0.688624877

01:49:25.688 --> 01:49:26.720 way of doing it as well.

NOTE Confidence: 0.688624877

01:49:26.720 --> 01:49:27.980 But object ID is the quick and

NOTE Confidence: 0.688624877

01:49:27.980 --> 01:49:29.317 dirty way to kind of show them.

NOTE Confidence: 0.688624877

01:49:29.320 --> 01:49:31.665 So typically if I am cutting my

NOTE Confidence: 0.688624877

01:49:31.665 --> 01:49:33.000 cells and using that cut tool,

NOTE Confidence: 0.688624877

01:49:33.000 --> 01:49:34.750 I'm usually in the object ID because

NOTE Confidence: 0.688624877

01:49:34.750 --> 01:49:36.516 that'll tell me exactly if I cut it,

NOTE Confidence: 0.688624877

01:49:36.520 --> 01:49:38.634 it'll show me the colors really clearly.

NOTE Confidence: 0.688624877

01:49:38.640 --> 01:49:39.320 It's like, Oh yeah, look,

NOTE Confidence: 0.688624877

01:49:39.320 --> 01:49:40.520 cut that little piece off.

NOTE Confidence: 0.688624877

01:49:40.520 --> 01:49:42.430 I can go find that or I can undo it

NOTE Confidence: 0.688624877

01:49:42.485 --> 01:49:44.557 and and and merge them together later.

NOTE Confidence: 0.875588861176471

01:49:47.920 --> 01:49:49.747 OK. I'm going to try to go through all

NOTE Confidence: 0.875588861176471

01:49:49.747 --> 01:49:51.813 the questions here as best I can here so

NOTE Confidence: 0.875588861176471

01:49:51.813 --> 01:49:53.517 that we don't get through the end here.

NOTE Confidence: 0.875588861176471

01:49:53.520 --> 01:49:55.640 So I know we're a little bit past our time,

NOTE Confidence: 0.875588861176471

01:49:55.640 --> 01:49:56.846 but hopefully it looks like most

NOTE Confidence: 0.875588861176471

01:49:56.846 --> 01:49:57.960 people kind of stuck around.

NOTE Confidence: 0.875588861176471

01:49:57.960 --> 01:50:00.800 So great. I appreciate that.

NOTE Confidence: 0.875588861176471

01:50:00.800 --> 01:50:01.745 So, hi, Matthew.

NOTE Confidence: 0.875588861176471

01:50:01.745 --> 01:50:03.950 I'm wondering how to use that microblia

NOTE Confidence: 0.875588861176471

01:50:04.009 --> 01:50:06.665 image to do stroll analysis after it is

NOTE Confidence: 0.875588861176471

01:50:06.665 --> 01:50:08.398 reconstructed using the filament tool.

NOTE Confidence: 0.875588861176471

01:50:08.400 --> 01:50:11.000 So I think I mentioned that real briefly.

NOTE Confidence: 0.875588861176471

01:50:11.000 --> 01:50:13.422 Again, Fill in analysis is a totally

NOTE Confidence: 0.875588861176471

01:50:13.422 --> 01:50:15.597 separate seminar that we can talk about.

NOTE Confidence: 0.875588861176471

01:50:15.600 --> 01:50:18.820 But any kind of filament that you've

NOTE Confidence: 0.875588861176471

01:50:18.820 --> 01:50:21.280 generated, any filament object that

NOTE Confidence: 0.875588861176471

01:50:21.280 --> 01:50:24.248 you've created under the Statistics tab,

NOTE Confidence: 0.875588861176471

01:50:24.248 --> 01:50:27.200 the stroll analysis is right here.

NOTE Confidence: 0.875588861176471

01:50:27.200 --> 01:50:28.280 And so it does it.

NOTE Confidence: 0.875588861176471

01:50:28.280 --> 01:50:29.561 You'll see there's going to be a

NOTE Confidence: 0.875588861176471

01:50:29.561 --> 01:50:30.657 lot of data here, unfortunately.

NOTE Confidence: 0.875588861176471

01:50:30.657 --> 01:50:33.033 Sometimes it's a little bit hard to imagine,

NOTE Confidence: 0.875588861176471

01:50:33.040 --> 01:50:34.400 but there's a filament ID,

NOTE Confidence: 0.875588861176471

01:50:34.400 --> 01:50:37.277 so every filament has its own ID.

NOTE Confidence: 0.875588861176471

01:50:37.280 --> 01:50:38.190 If you wanted to kind of make

NOTE Confidence: 0.875588861176471

01:50:38.190 --> 01:50:39.000 it a little bit simpler,

NOTE Confidence: 0.875588861176471

01:50:39.000 --> 01:50:40.248 maybe you don't have as many

NOTE Confidence: 0.875588861176471

01:50:40.248 --> 01:50:40.872 in the structure,

NOTE Confidence: 0.875588861176471

01:50:40.880 --> 01:50:43.247 but if you kind of take this guy out

NOTE Confidence: 0.875588861176471

01:50:43.247 --> 01:50:45.754 and just duplicate it out on its own,

NOTE Confidence: 0.875588861176471

01:50:45.760 --> 01:50:46.985 then the Shoal analysis will

NOTE Confidence: 0.875588861176471

01:50:46.985 --> 01:50:48.818 kind of be all by itself, right?

NOTE Confidence: 0.875588861176471

01:50:48.818 --> 01:50:49.886 It'll be a little bit easier

NOTE Confidence: 0.875588861176471

01:50:49.886 --> 01:50:51.199 to kind of export and look at.

NOTE Confidence: 0.875588861176471

01:50:51.200 --> 01:50:53.475 But if you export that to Excel,

NOTE Confidence: 0.875588861176471

01:50:53.480 --> 01:50:56.747 that that value is there and you can see

NOTE Confidence: 0.875588861176471

01:50:56.747 --> 01:51:00.015 the intersections here one through 10,

NOTE Confidence: 0.875588861176471

01:51:00.015 --> 01:51:03.005 and it's doing it on one Micron intervals.

NOTE Confidence: 0.875588861176471

01:51:03.005 --> 01:51:05.000 So if you wanted to do every 10,

NOTE Confidence: 0.875588861176471

01:51:05.000 --> 01:51:05.966 you just have to go out and

NOTE Confidence: 0.875588861176471

01:51:05.966 --> 01:51:06.520 pull out every 10,

NOTE Confidence: 0.875588861176471

01:51:06.520 --> 01:51:08.080 It's probably the easiest way to do it.

NOTE Confidence: 0.875588861176471

01:51:08.080 --> 01:51:10.410 There is an option here to

NOTE Confidence: 0.875588861176471

01:51:10.410 --> 01:51:12.582 set the Shoal resolution.

NOTE Confidence: 0.875588861176471

01:51:12.582 --> 01:51:16.074 By default it's set to one,

NOTE Confidence: 0.875588861176471

01:51:16.080 --> 01:51:17.396 but if I change this to 10,

NOTE Confidence: 0.875588861176471

01:51:17.400 --> 01:51:18.928 it's not going to change my statistics here

NOTE Confidence: 0.875588861176471

01:51:18.928 --> 01:51:20.357 because I already created my filament.

NOTE Confidence: 0.875588861176471

01:51:20.360 --> 01:51:22.760 If I set this to 10 and then do my filament,

NOTE Confidence: 0.875588861176471

01:51:22.760 --> 01:51:25.320 then it's only going to show every 10.

NOTE Confidence: 0.875588861176471

01:51:25.320 --> 01:51:27.450 So I I tend to just like the 1 Micron

NOTE Confidence: 0.875588861176471

01:51:27.517 --> 01:51:29.645 view here and then export it to Excel

NOTE Confidence: 0.875588861176471

01:51:29.645 --> 01:51:31.680 and then just take every 10th one.

NOTE Confidence: 0.875588861176471

01:51:31.680 --> 01:51:33.591 It's pretty easy to do that in

NOTE Confidence: 0.875588861176471

01:51:33.591 --> 01:51:35.132 Excel and other applications to

NOTE Confidence: 0.875588861176471

01:51:35.132 --> 01:51:37.421 kind of get the the resolution that

NOTE Confidence: 0.875588861176471

01:51:37.421 --> 01:51:39.478 you want for for Shoal analysis.

NOTE Confidence: 0.875588861176471

01:51:39.480 --> 01:51:40.920 OK,

NOTE Confidence: 0.875588861176471

01:51:40.920 --> 01:51:44.091 is it possible to batch export one

NOTE Confidence: 0.875588861176471

01:51:44.091 --> 01:51:46.920 specific data from multiple image,

NOTE Confidence: 0.9029716075

01:51:50.480 --> 01:51:53.200 one specific statistic out?

NOTE Confidence: 0.886411284

01:51:58.360 --> 01:52:00.600 You can't. Well, kind of.

NOTE Confidence: 0.886411284

01:52:00.600 --> 01:52:04.140 I guess this is a little bit

NOTE Confidence: 0.886411284

01:52:04.140 --> 01:52:05.640 of a tricky scenario here.

NOTE Confidence: 0.886411284

01:52:05.640 --> 01:52:07.194 Let me show you real quick here,

NOTE Confidence: 0.886411284

01:52:07.200 --> 01:52:09.198 see if I can demonstrate it on an example.

NOTE Confidence: 0.886411284

01:52:09.200 --> 01:52:11.034 Let's see if I'm going to hopefully,

NOTE Confidence: 0.886411284

01:52:11.040 --> 01:52:12.398 hopefully I'm going to answer your question.

NOTE Confidence: 0.886411284

01:52:12.400 --> 01:52:15.200 I know we don't have any audio for you guys,

NOTE Confidence: 0.886411284

01:52:15.200 --> 01:52:17.503 but basically what it seems like you're

NOTE Confidence: 0.886411284

01:52:17.503 --> 01:52:19.546 asking where let's go here, go here.

NOTE Confidence: 0.886411284

01:52:19.546 --> 01:52:21.457 I'm going to just get rid of

NOTE Confidence: 0.886411284

01:52:21.457 --> 01:52:23.400 all these guys getting away.

NOTE Confidence: 0.871272371428572

01:52:29.880 --> 01:52:32.995 OK, so if these are three cells,

NOTE Confidence: 0.871272371428572

01:52:33.000 --> 01:52:36.080 3 images that I processed,

NOTE Confidence: 0.871272371428572

01:52:36.080 --> 01:52:39.200 if I come up here in this guy,

NOTE Confidence: 0.871272371428572

01:52:39.200 --> 01:52:41.328 you can see how there's a there's

NOTE Confidence: 0.871272371428572

01:52:41.328 --> 01:52:42.920 a surface that's called KO.

NOTE Confidence: 0.871272371428572

01:52:42.920 --> 01:52:44.393 They say It's A Knockout, whatever.

NOTE Confidence: 0.871272371428572

01:52:44.393 --> 01:52:46.393 Then here's my red signal, right?

NOTE Confidence: 0.871272371428572

01:52:46.393 --> 01:52:47.558 These are two separate surfaces.

NOTE Confidence: 0.871272371428572

01:52:47.560 --> 01:52:50.586 There's there's this guy here,

NOTE Confidence: 0.871272371428572

01:52:50.586 --> 01:52:53.354 nice and big, and there's this KO guy.

NOTE Confidence: 0.871272371428572

01:52:53.360 --> 01:52:54.792 That's this guy, right?

NOTE Confidence: 0.871272371428572

01:52:54.792 --> 01:52:57.480 Two separate surface objects with KO and red.

NOTE Confidence: 0.871272371428572

01:52:57.480 --> 01:52:59.236 And I saved that file, right?

NOTE Confidence: 0.871272371428572

01:52:59.236 --> 01:53:01.124 If I come back over here and I

NOTE Confidence: 0.871272371428572

01:53:01.124 --> 01:53:02.920 look at these images here, here,

NOTE Confidence: 0.871272371428572

01:53:02.920 --> 01:53:06.400 there's a KO in this image, right?

NOTE Confidence: 0.871272371428572

01:53:06.400 --> 01:53:07.597 I've made that surface I don't have.

NOTE Confidence: 0.871272371428572

01:53:07.600 --> 01:53:08.797 I don't have the red in here,

NOTE Confidence: 0.871272371428572

01:53:08.800 --> 01:53:10.120 but I have the KO surface in here.

NOTE Confidence: 0.871272371428572

01:53:10.120 --> 01:53:12.180 And then let's just say I open up this file

NOTE Confidence: 0.871272371428572

01:53:12.236 --> 01:53:14.156 and I have a KO in that surface as well.

NOTE Confidence: 0.871272371428572

01:53:14.160 --> 01:53:16.932 So I have 3 surfaces I've made

NOTE Confidence: 0.871272371428572

01:53:16.932 --> 01:53:19.795 all with the same exact name in

NOTE Confidence: 0.871272371428572

01:53:19.795 --> 01:53:21.160 the file and I did it manually.

NOTE Confidence: 0.871272371428572

01:53:21.160 --> 01:53:22.679 I didn't do this through a batch,

NOTE Confidence: 0.871272371428572

01:53:22.680 --> 01:53:23.420 I did it manually.

NOTE Confidence: 0.871272371428572

01:53:23.420 --> 01:53:24.160 I'd made each one,

NOTE Confidence: 0.871272371428572

01:53:24.160 --> 01:53:27.480 but each one is the same surpass name.

NOTE Confidence: 0.871272371428572

01:53:27.480 --> 01:53:29.314 A nice little feature of Mars is

NOTE Confidence: 0.871272371428572

01:53:29.314 --> 01:53:31.262 the way the batch process kind of

NOTE Confidence: 0.871272371428572

01:53:31.262 --> 01:53:33.329 works is that it does it because

NOTE Confidence: 0.871272371428572

01:53:33.329 --> 01:53:35.119 it renames the new surfaces,

NOTE Confidence: 0.871272371428572

01:53:35.120 --> 01:53:38.600 it creates it in the same with the same name.

NOTE Confidence: 0.871272371428572

01:53:38.600 --> 01:53:40.076 That's how the batch processing works.

NOTE Confidence: 0.871272371428572

01:53:40.080 --> 01:53:41.328 If you would kind of go up here

NOTE Confidence: 0.871272371428572

01:53:41.328 --> 01:53:42.480 and run a batch and do that,

NOTE Confidence: 0.871272371428572

01:53:42.480 --> 01:53:43.956 every new surface object it makes,

NOTE Confidence: 0.871272371428572

01:53:43.960 --> 01:53:44.968 it's going to have the same

NOTE Confidence: 0.871272371428572

01:53:44.968 --> 01:53:46.221 exact name and it's going to be

NOTE Confidence: 0.871272371428572

01:53:46.221 --> 01:53:47.116 able to merge them together.

NOTE Confidence: 0.871272371428572

01:53:47.120 --> 01:53:49.788 You can do that manually based on that KO.

NOTE Confidence: 0.871272371428572

01:53:49.788 --> 01:53:50.559 So I can,

NOTE Confidence: 0.871272371428572

01:53:50.560 --> 01:53:52.612 if I select three of those

NOTE Confidence: 0.871272371428572

01:53:52.612 --> 01:53:54.514 guys and I do new plot up here,

NOTE Confidence: 0.871272371428572

01:53:54.520 --> 01:53:58.356 it's going to take those three files.

NOTE Confidence: 0.871272371428572

01:53:58.360 --> 01:53:59.634 Not going to do the red one,

NOTE Confidence: 0.871272371428572

01:53:59.640 --> 01:54:02.920 but it has the KO and in the KO down here

NOTE Confidence: 0.96637139

01:54:05.480 --> 01:54:08.980 you can go to whatever statistic

NOTE Confidence: 0.96637139

01:54:08.980 --> 01:54:10.060 doesn't matter, let's just

NOTE Confidence: 0.96637139

01:54:10.060 --> 01:54:11.519 do let's do objects for you.

NOTE Confidence: 0.96637139

01:54:11.520 --> 01:54:12.280 It doesn't really matter,

NOTE Confidence: 0.50627676

01:54:16.240 --> 01:54:17.320 right? So

NOTE Confidence: 0.6564946875

01:54:21.200 --> 01:54:23.162 so I come out here and I do like

NOTE Confidence: 0.6564946875

01:54:23.162 --> 01:54:25.608 a scatter plot. So the idea here,

NOTE Confidence: 0.6564946875

01:54:25.608 --> 01:54:28.623 if I look at that KO surface I made,

NOTE Confidence: 0.6564946875

01:54:28.623 --> 01:54:30.328 there's a column over here

NOTE Confidence: 0.6564946875

01:54:30.328 --> 01:54:32.160 that says image name, right?

NOTE Confidence: 0.6564946875

01:54:32.160 --> 01:54:33.240 That's the image.

NOTE Confidence: 0.6564946875

01:54:33.240 --> 01:54:35.896 So this is 7/3, there's 74, there's 76.

NOTE Confidence: 0.6564946875

01:54:35.896 --> 01:54:37.720 So all three images are there.

NOTE Confidence: 0.6564946875

01:54:37.720 --> 01:54:40.668 All the data here from there that has

NOTE Confidence: 0.6564946875

01:54:40.668 --> 01:54:43.426 that KO surface are here and it's

NOTE Confidence: 0.6564946875

01:54:43.426 --> 01:54:45.680 identified based on the image name.

NOTE Confidence: 0.6564946875

01:54:45.680 --> 01:54:47.514 And so from this I use Vantage

NOTE Confidence: 0.6564946875

01:54:47.514 --> 01:54:50.025 to say I use Vantage a lot for

NOTE Confidence: 0.6564946875

01:54:50.025 --> 01:54:52.080 kind of exporting data like this.

NOTE Confidence: 0.6564946875

01:54:52.080 --> 01:54:54.496 So if you wanted to kind of just

NOTE Confidence: 0.6564946875

01:54:54.496 --> 01:54:56.537 export KO from all three images

NOTE Confidence: 0.6564946875

01:54:56.537 --> 01:54:58.536 and only do you know say you

NOTE Confidence: 0.6564946875

01:54:58.536 --> 01:55:00.000 wanted to do so the position,

NOTE Confidence: 0.6564946875

01:55:00.000 --> 01:55:01.800 the graph here is you can make a graph,

NOTE Confidence: 0.6564946875

01:55:01.800 --> 01:55:01.948 right?

NOTE Confidence: 0.6564946875

01:55:01.948 --> 01:55:03.280 You can do any kind of thing in Vantage.

NOTE Confidence: 0.6564946875

01:55:03.280 --> 01:55:04.365 But sometimes I don't use

NOTE Confidence: 0.6564946875

01:55:04.365 --> 01:55:05.233 the Vantage for graph.

NOTE Confidence: 0.6564946875

01:55:05.240 --> 01:55:06.906 Sometimes I use it for data export

NOTE Confidence: 0.6564946875

01:55:06.906 --> 01:55:09.670 and say I want to export area,

NOTE Confidence: 0.6564946875

01:55:09.670 --> 01:55:15.731 surface area, volume and intensity, right.

NOTE Confidence: 0.6564946875

01:55:15.731 --> 01:55:17.957 And then bounding box length C,

NOTE Confidence: 0.6564946875

01:55:17.960 --> 01:55:18.640 whatever, right.

NOTE Confidence: 0.6564946875

01:55:18.640 --> 01:55:21.360 And so I have those three statistics here,

NOTE Confidence: 0.6564946875

01:55:21.360 --> 01:55:23.184 area, volume, intensity,

NOTE Confidence: 0.6564946875

01:55:23.184 --> 01:55:25.153 bounding box, they're all here.

NOTE Confidence: 0.6564946875

01:55:25.153 --> 01:55:27.438 And I know which one is coming from which

NOTE Confidence: 0.6564946875

01:55:27.438 --> 01:55:29.640 image and I can save this data out here,

NOTE Confidence: 0.6564946875

01:55:29.640 --> 01:55:30.000 right?

NOTE Confidence: 0.6564946875

01:55:30.000 --> 01:55:32.520 And I can save Vantage for whatever.

NOTE Confidence: 0.6564946875

01:55:32.520 --> 01:55:34.400 And so now I have all my data.

NOTE Confidence: 0.6564946875

01:55:34.400 --> 01:55:36.088 It's going to be in a little bit

NOTE Confidence: 0.6564946875

01:55:36.088 --> 01:55:37.880 of a not a complicated form,

NOTE Confidence: 0.6564946875

01:55:37.880 --> 01:55:39.914 but it's going to be in an Excel sheet

NOTE Confidence: 0.6564946875

01:55:39.920 --> 01:55:43.119 that's going to look something like this.

NOTE Confidence: 0.6564946875

01:55:43.120 --> 01:55:44.672 It's not super organized,

NOTE Confidence: 0.6564946875

01:55:44.672 --> 01:55:47.150 but you have the statistic here that you

NOTE Confidence: 0.6564946875

01:55:47.150 --> 01:55:49.000 were really interested in those three guys,

NOTE Confidence: 0.6564946875

01:55:49.000 --> 01:55:49.325 right?

NOTE Confidence: 0.6564946875

01:55:49.325 --> 01:55:50.300 Your area volume,

NOTE Confidence: 0.6564946875

01:55:50.300 --> 01:55:52.759 mean all the other stuff is kind of

NOTE Confidence: 0.6564946875

01:55:52.760 --> 01:55:56.896 not really useful except for the one

NOTE Confidence: 0.6564946875

01:55:56.896 --> 01:55:58.240 all the way over here on the right,

NOTE Confidence: 0.6564946875

01:55:58.240 --> 01:56:01.440 which is your image ID,

NOTE Confidence: 0.6564946875

01:56:01.440 --> 01:56:01.616 right?

NOTE Confidence: 0.6564946875

01:56:01.616 --> 01:56:03.200 So this tells you what image it came from.

NOTE Confidence: 0.6564946875

01:56:03.200 --> 01:56:04.229 So I would keep pretty much can

NOTE Confidence: 0.6564946875

01:56:04.229 --> 01:56:05.230 get rid of everything else for

NOTE Confidence: 0.6564946875

01:56:05.230 --> 01:56:06.455 the most part and kind of keep

NOTE Confidence: 0.6564946875

01:56:06.490 --> 01:56:07.505 the original component and that

NOTE Confidence: 0.6564946875

01:56:07.505 --> 01:56:09.033 helps you identify what it is.

NOTE Confidence: 0.6564946875

01:56:09.033 --> 01:56:11.788 But basically that image ID tells

NOTE Confidence: 0.6564946875

01:56:11.788 --> 01:56:12.916 you which image it came from.

NOTE Confidence: 0.6564946875

01:56:12.920 --> 01:56:14.792 So that's the best way to do multiple images,

NOTE Confidence: 0.6564946875

01:56:14.800 --> 01:56:16.796 multiple statistics kind of

NOTE Confidence: 0.6564946875

01:56:16.796 --> 01:56:18.792 simultaneously without having to

NOTE Confidence: 0.6564946875

01:56:18.792 --> 01:56:20.760 export individual data from Mrs.

NOTE Confidence: 0.6564946875

01:56:20.760 --> 01:56:22.671 It's a nice little trick to kind

NOTE Confidence: 0.6564946875

01:56:22.671 --> 01:56:24.474 of group them together kind of

NOTE Confidence: 0.6564946875

01:56:24.474 --> 01:56:25.999 in a semi automated way.

NOTE Confidence: 0.6564946875

01:56:26.000 --> 01:56:27.848 As long as you rename them

NOTE Confidence: 0.6564946875

01:56:27.848 --> 01:56:29.080 exactly the same name,

NOTE Confidence: 0.6564946875

01:56:29.080 --> 01:56:31.055 you can export those surfaces

NOTE Confidence: 0.6564946875

01:56:31.055 --> 01:56:32.635 out together and combine.

NOTE Confidence: 0.6564946875

01:56:32.640 --> 01:56:33.920 Hopefully that answers your question.

NOTE Confidence: 0.756537318333333

01:56:38.280 --> 01:56:39.876 When looking at object object stats,

NOTE Confidence: 0.756537318333333

01:56:39.880 --> 01:56:41.805 is it possible to look at the

NOTE Confidence: 0.756537318333333

01:56:41.805 --> 01:56:44.720 overlap area ratio to surfaces?

NOTE Confidence: 0.832658223333333

01:56:48.240 --> 01:56:49.758 Looking at the object object stats,

NOTE Confidence: 0.832658223333333

01:56:49.760 --> 01:56:52.140 is it possible to look at the

NOTE Confidence: 0.832658223333333

01:56:52.140 --> 01:56:53.640 overlap surface area ratio?

NOTE Confidence: 0.832658223333333

01:56:53.640 --> 01:56:59.434 No, we don't do a surface surface contact.

NOTE Confidence: 0.832658223333333

01:56:59.440 --> 01:57:00.400 I think, I think that's

NOTE Confidence: 0.832658223333333

01:57:00.400 --> 01:57:01.360 kind of what you're asking.

NOTE Confidence: 0.832658223333333

01:57:01.360 --> 01:57:04.874 There is no surface to surface contact

NOTE Confidence: 0.832658223333333

01:57:04.880 --> 01:57:08.142 statistic that is something to that

NOTE Confidence: 0.832658223333333

01:57:08.142 --> 01:57:10.558 would be a really nice statistic to have.

NOTE Confidence: 0.832658223333333

01:57:10.560 --> 01:57:12.120 If you reach out to me,

NOTE Confidence: 0.832658223333333

01:57:12.120 --> 01:57:14.232 there is an extension that kind of does

NOTE Confidence: 0.832658223333333

01:57:14.232 --> 01:57:16.520 a little bit of surface surface contact.

NOTE Confidence: 0.832658223333333

01:57:16.520 --> 01:57:18.116 It is not an officially supported

NOTE Confidence: 0.832658223333333

01:57:18.116 --> 01:57:18.914 bit plan extension.

NOTE Confidence: 0.832658223333333

01:57:18.920 --> 01:57:20.285 It's it's a custom extension

NOTE Confidence: 0.832658223333333

01:57:20.285 --> 01:57:21.920 I wrote a little while ago,

NOTE Confidence: 0.832658223333333

01:57:21.920 --> 01:57:23.648 but it's I'd be more than happy to show

NOTE Confidence: 0.832658223333333

01:57:23.648 --> 01:57:25.412 that to you if that's if that's what

NOTE Confidence: 0.832658223333333

01:57:25.412 --> 01:57:26.846 you're looking for and looking for

NOTE Confidence: 0.832658223333333

01:57:26.846 --> 01:57:28.554 kind of a surface surface contact value.

NOTE Confidence: 0.832658223333333

01:57:28.560 --> 01:57:29.799 I I can show it to people.

NOTE Confidence: 0.832658223333333

01:57:29.800 --> 01:57:31.252 I've used it and published it

NOTE Confidence: 0.832658223333333

01:57:31.252 --> 01:57:32.560 over the past couple years.

NOTE Confidence: 0.832658223333333

01:57:32.560 --> 01:57:33.931 That's relatively straightforward

NOTE Confidence: 0.832658223333333

01:57:33.931 --> 01:57:36.673 to to kind of unique application.

NOTE Confidence: 0.832658223333333

01:57:36.680 --> 01:57:37.705 It's not something you need

NOTE Confidence: 0.832658223333333

01:57:37.705 --> 01:57:38.320 the extension for.

NOTE Confidence: 0.832658223333333

01:57:38.320 --> 01:57:39.280 You can do it manually,

NOTE Confidence: 0.832658223333333

01:57:39.280 --> 01:57:41.422 but I can show you how that works to

NOTE Confidence: 0.832658223333333

01:57:41.422 --> 01:57:43.680 to apply that within your data set.

NOTE Confidence: 0.832658223333333

01:57:43.680 --> 01:57:44.500 If that's something that

NOTE Confidence: 0.832658223333333

01:57:44.500 --> 01:57:45.115 you're interested in.

NOTE Confidence: 0.832658223333333

01:57:45.120 --> 01:57:46.914 Just reach out to me separately

NOTE Confidence: 0.832658223333333

01:57:46.914 --> 01:57:48.318 and and set up a time.

NOTE Confidence: 0.832658223333333

01:57:48.320 --> 01:57:49.504 Show me your data.

NOTE Confidence: 0.832658223333333

01:57:49.504 --> 01:57:50.984 We can see what you're

NOTE Confidence: 0.832658223333333

01:57:50.984 --> 01:57:52.638 what you're trying to do,

NOTE Confidence: 0.832658223333333

01:57:52.640 --> 01:57:54.476 How to measure the whole stereology

NOTE Confidence: 0.832658223333333

01:57:54.476 --> 01:57:56.320 volume of the whole structure.

NOTE Confidence: 0.854397044444445

01:57:58.400 --> 01:58:00.422 Not exactly sure what you mean

NOTE Confidence: 0.854397044444445

01:58:00.422 --> 01:58:02.320 by that question. Specifically,

NOTE Confidence: 0.9595379725

01:58:04.440 --> 01:58:06.640 if you wanted to open up a file,

NOTE Confidence: 0.9595379725

01:58:06.640 --> 01:58:10.055 any file from your data,

NOTE Confidence: 0.9595379725

01:58:10.055 --> 01:58:12.280 the size of your volume,

NOTE Confidence: 0.9595379725

01:58:12.280 --> 01:58:14.596 the size of the acquisition data,

NOTE Confidence: 0.9595379725

01:58:14.600 --> 01:58:15.755 I don't know if that's

NOTE Confidence: 0.9595379725

01:58:15.755 --> 01:58:16.679 what you're looking for.

NOTE Confidence: 0.9595379725

01:58:16.680 --> 01:58:17.680 If you click on volume,

NOTE Confidence: 0.9595379725

01:58:17.680 --> 01:58:19.456 there are some statistics relative to

NOTE Confidence: 0.9595379725

01:58:19.456 --> 01:58:21.398 the whole volume from top to bottom.

NOTE Confidence: 0.9595379725

01:58:21.400 --> 01:58:23.144 So we have intensity, Max, mean,

NOTE Confidence: 0.9595379725

01:58:23.144 --> 01:58:24.840 min, standard deviation sum,

NOTE Confidence: 0.9595379725

01:58:24.840 --> 01:58:26.305 but you also have the

NOTE Confidence: 0.9595379725

01:58:26.305 --> 01:58:27.477 volume of that acquisition.

NOTE Confidence: 0.9595379725

01:58:27.480 --> 01:58:29.951 So that's the volume of your acquired

NOTE Confidence: 0.9595379725

01:58:29.951 --> 01:58:32.188 image from top to bottom, right?

NOTE Confidence: 0.9595379725

01:58:32.188 --> 01:58:33.472 Every single slice,

NOTE Confidence: 0.9595379725

01:58:33.472 --> 01:58:35.423 every single pixel gives you that

NOTE Confidence: 0.9595379725

01:58:35.423 --> 01:58:36.970 app that the volume of the entire

NOTE Confidence: 0.9595379725

01:58:37.025 --> 01:58:38.320 acquisition of the data set.

NOTE Confidence: 0.9595379725

01:58:38.320 --> 01:58:39.238 So the more slices you have,

NOTE Confidence: 0.9595379725

01:58:39.240 --> 01:58:40.264 the bigger the volume.

NOTE Confidence: 0.9595379725

01:58:40.264 --> 01:58:42.595 I don't know if that answers

NOTE Confidence: 0.9595379725

01:58:42.595 --> 01:58:44.025 your question or not.

NOTE Confidence: 0.9595379725

01:58:44.025 --> 01:58:44.395 If not,

NOTE Confidence: 0.9595379725

01:58:44.395 --> 01:58:45.320 please reach out to me.

NOTE Confidence: 0.9595379725

01:58:45.320 --> 01:58:47.140 We can we can talk more about

NOTE Confidence: 0.9595379725

01:58:47.140 --> 01:58:48.112 exactly what you're what

NOTE Confidence: 0.9595379725

01:58:48.112 --> 01:58:48.880 you're talking about there.

NOTE Confidence: 0.953940092

01:58:52.560 --> 01:58:54.680 OK. Where are we here? Sorry, sorry.

NOTE Confidence: 0.845406243333333

01:59:05.280 --> 01:59:08.440 There are some, there are some

NOTE Confidence: 0.845406243333333

01:59:08.440 --> 01:59:09.736 bright spots, integration at

NOTE Confidence: 0.845406243333333

01:59:09.736 --> 01:59:12.560 the random spots, similar sizes.

NOTE Confidence: 0.845406243333333

01:59:12.560 --> 01:59:14.594 That's also how do you get rid of them.

NOTE Confidence: 0.924964878571429

01:59:16.800 --> 01:59:18.676 I would say to answer that question,

NOTE Confidence: 0.924964878571429

01:59:18.680 --> 01:59:22.240 probably the machine learning

NOTE Confidence: 0.924964878571429

01:59:22.240 --> 01:59:25.080 probably could do that.

NOTE Confidence: 0.924964878571429

01:59:25.080 --> 01:59:26.516 Sometimes the machine learning,

NOTE Confidence: 0.924964878571429

01:59:26.516 --> 01:59:27.952 object based machine learning

NOTE Confidence: 0.924964878571429

01:59:27.952 --> 01:59:29.839 after you generate your objects,

NOTE Confidence: 0.924964878571429

01:59:29.840 --> 01:59:31.360 being able to kind of say hey that's a cell,

NOTE Confidence: 0.924964878571429

01:59:31.360 --> 01:59:32.520 that's a cell, that's noise,

NOTE Confidence: 0.924964878571429

01:59:32.520 --> 01:59:36.320 that's noise you'd be crazy to to to

NOTE Confidence: 0.924964878571429

01:59:36.320 --> 01:59:38.000 think sometimes it's not going to work,

NOTE Confidence: 0.924964878571429

01:59:38.000 --> 01:59:39.165 but sometimes I'm like that's

NOTE Confidence: 0.924964878571429

01:59:39.165 --> 01:59:40.925 not going to work and it actually

NOTE Confidence: 0.924964878571429

01:59:40.925 --> 01:59:42.760 worked to me without seeing the

NOTE Confidence: 0.924964878571429

01:59:42.760 --> 01:59:44.608 data that's probably going to be

NOTE Confidence: 0.924964878571429

01:59:44.608 --> 01:59:46.633 your best bet to to get rid of them.

NOTE Confidence: 0.924964878571429

01:59:46.640 --> 01:59:48.710 And again even the pixel classification

NOTE Confidence: 0.924964878571429

01:59:48.710 --> 01:59:51.195 a lot of times pixel classification is

NOTE Confidence: 0.924964878571429

01:59:51.195 --> 01:59:54.000 also good enough to get rid of them.

NOTE Confidence: 0.924964878571429

01:59:54.000 --> 01:59:55.880 Point in case I didn't,

NOTE Confidence: 0.924964878571429

01:59:55.880 --> 01:59:58.600 I was going to get into it but I didn't.

NOTE Confidence: 0.924964878571429

01:59:58.600 --> 02:00:00.203 I wanted to show you this example

NOTE Confidence: 0.924964878571429

02:00:00.203 --> 02:00:01.524 because it kind of demonstrates

NOTE Confidence: 0.924964878571429

02:00:01.524 --> 02:00:03.276 the power of the pixel classifier.

NOTE Confidence: 0.924964878571429

02:00:03.280 --> 02:00:06.040 Let's see if I put it in here.

NOTE Confidence: 0.924964878571429

02:00:06.040 --> 02:00:06.676 I think I put it in.

NOTE Confidence: 0.798897984166667

02:00:09.480 --> 02:00:10.740 Yeah, here. So I'm not going to

NOTE Confidence: 0.798897984166667

02:00:10.740 --> 02:00:11.839 go through the process here,

NOTE Confidence: 0.798897984166667

02:00:11.840 --> 02:00:14.840 but I did this right before we came in here.

NOTE Confidence: 0.798897984166667

02:00:14.840 --> 02:00:16.982 So this is kind of a one

NOTE Confidence: 0.798897984166667

02:00:16.982 --> 02:00:18.839 of our demo data sets.

NOTE Confidence: 0.798897984166667

02:00:18.840 --> 02:00:20.094 You can see there's a lot

NOTE Confidence: 0.798897984166667

02:00:20.094 --> 02:00:21.439 of blue in this data set.

NOTE Confidence: 0.798897984166667

02:00:21.440 --> 02:00:23.092 There's a lot of small little cells

NOTE Confidence: 0.798897984166667

02:00:23.092 --> 02:00:24.652 over here and then there's these

NOTE Confidence: 0.798897984166667

02:00:24.652 --> 02:00:26.858 big nurse nuclei in the middle here

NOTE Confidence: 0.798897984166667

02:00:26.858 --> 02:00:28.760 that create these big surfaces,

NOTE Confidence: 0.798897984166667

02:00:28.760 --> 02:00:30.876 if you can make those big surfaces, right.

NOTE Confidence: 0.798897984166667

02:00:30.876 --> 02:00:34.684 However, if I were to make a regular

NOTE Confidence: 0.798897984166667

02:00:34.684 --> 02:00:37.420 surface in a Morris and I do the

NOTE Confidence: 0.798897984166667

02:00:37.420 --> 02:00:38.845 pixel classification to try to

NOTE Confidence: 0.798897984166667

02:00:38.845 --> 02:00:40.679 render these small guys out here,

NOTE Confidence: 0.798897984166667

02:00:40.680 --> 02:00:42.160 you're going to get surfaces

NOTE Confidence: 0.798897984166667

02:00:42.160 --> 02:00:43.640 that are going to create.

NOTE Confidence: 0.798897984166667

02:00:43.640 --> 02:00:45.122 You're going to get surfaces that

NOTE Confidence: 0.798897984166667

02:00:45.122 --> 02:00:46.680 are going to create everything.

NOTE Confidence: 0.798897984166667

02:00:46.680 --> 02:00:49.039 You're going to get surfaces out here,

NOTE Confidence: 0.798897984166667

02:00:49.040 --> 02:00:50.755 you're going to get sub segmentation here,

NOTE Confidence: 0.798897984166667

02:00:50.760 --> 02:00:51.516 you get the surface out here,

NOTE Confidence: 0.798897984166667

02:00:51.520 --> 02:00:53.158 you get a lot of junk everywhere.

NOTE Confidence: 0.798897984166667

02:00:53.160 --> 02:00:55.716 However, if you do pixel classification

NOTE Confidence: 0.798897984166667

02:00:55.720 --> 02:00:57.238 and I do something like this,

NOTE Confidence: 0.798897984166667

02:00:57.240 --> 02:00:59.536 I can train it so that I'm only

NOTE Confidence: 0.798897984166667

02:00:59.536 --> 02:01:00.600 rendering these pixels,

NOTE Confidence: 0.798897984166667

02:01:00.600 --> 02:01:03.400 these the nuclei that are out here.

NOTE Confidence: 0.798897984166667

02:01:03.400 --> 02:01:05.264 It's not rendering these

NOTE Confidence: 0.798897984166667

02:01:05.264 --> 02:01:07.594 Big Blue nurse nuclei here.

NOTE Confidence: 0.798897984166667

02:01:07.600 --> 02:01:07.920 Why?

NOTE Confidence: 0.798897984166667

02:01:07.920 --> 02:01:09.840 Because I trained it as background,

NOTE Confidence: 0.798897984166667

02:01:09.840 --> 02:01:09.987 right?

NOTE Confidence: 0.798897984166667

02:01:09.987 --> 02:01:11.310 And if I come up here and I just

NOTE Confidence: 0.798897984166667

02:01:11.352 --> 02:01:12.598 show you real quickly what I did,

NOTE Confidence: 0.798897984166667

02:01:12.600 --> 02:01:14.200 I think it'll come up.

NOTE Confidence: 0.917285407777778

02:01:17.200 --> 02:01:19.675 You come in here, you can see I trained.

NOTE Confidence: 0.897597282

02:01:22.440 --> 02:01:24.241 I trained that as background, right?

NOTE Confidence: 0.897597282

02:01:24.241 --> 02:01:25.960 I came in here and you can see where is it.

NOTE Confidence: 0.73773775

02:01:32.230 --> 02:01:33.310 You know, I trained all these. I

NOTE Confidence: 0.556348633333333

02:01:36.350 --> 02:01:39.048 guess that's it. Oh, there.

NOTE Confidence: 0.556348633333333

02:01:39.048 --> 02:01:40.512 Yeah. So I trained all these

NOTE Confidence: 0.556348633333333

02:01:40.512 --> 02:01:41.720 pixels here as background,

NOTE Confidence: 0.556348633333333

02:01:41.720 --> 02:01:42.640 all that as background,

NOTE Confidence: 0.556348633333333

02:01:42.640 --> 02:01:43.560 all that as background.

NOTE Confidence: 0.556348633333333

02:01:43.560 --> 02:01:45.000 And then I went up here and I

NOTE Confidence: 0.556348633333333

02:01:45.000 --> 02:01:46.071 trained that as signal, right.

NOTE Confidence: 0.556348633333333

02:01:46.071 --> 02:01:47.919 And so even though it's blue and it's,

NOTE Confidence: 0.556348633333333

02:01:47.920 --> 02:01:49.999 it's a little bit brighter and blue,

NOTE Confidence: 0.556348633333333

02:01:50.000 --> 02:01:51.144 but it's still blue.

NOTE Confidence: 0.556348633333333

02:01:51.144 --> 02:01:53.316 I'm able to train that as background

NOTE Confidence: 0.556348633333333

02:01:53.316 --> 02:01:56.039 and totally ignore it for the creation.

NOTE Confidence: 0.556348633333333

02:01:56.040 --> 02:01:58.479 Now that's that might be an option as well.

NOTE Confidence: 0.556348633333333

02:01:58.480 --> 02:01:59.825 Again, the pixel classifier kind

NOTE Confidence: 0.556348633333333

02:01:59.825 --> 02:02:01.463 of surprises me sometime how well

NOTE Confidence: 0.556348633333333

02:02:01.463 --> 02:02:02.921 it's able to kind of separate

NOTE Confidence: 0.556348633333333

02:02:02.921 --> 02:02:03.960 separate those spots there.

NOTE Confidence: 0.556348633333333

02:02:03.960 --> 02:02:04.320 But again,

NOTE Confidence: 0.556348633333333

02:02:04.320 --> 02:02:05.760 without seeing the data set it'd be hard.

NOTE Confidence: 0.556348633333333

02:02:05.760 --> 02:02:07.716 So again, reach out to support.

NOTE Confidence: 0.556348633333333

02:02:07.720 --> 02:02:09.000 We can take a look at it together,

NOTE Confidence: 0.88685868

02:02:11.240 --> 02:02:13.400 such as one embryo which has many cells.

NOTE Confidence: 0.88685868

02:02:13.400 --> 02:02:16.032 I would like to measure how big size

NOTE Confidence: 0.88685868

02:02:16.032 --> 02:02:18.836 of the volume of the whole embryo,

NOTE Confidence: 0.88685868

02:02:18.840 --> 02:02:20.528 not only one individual

NOTE Confidence: 0.88685868

02:02:20.528 --> 02:02:22.638 cell volume of the embryo.

NOTE Confidence: 0.88685868

02:02:22.640 --> 02:02:25.313 Again, I would say in a case like that,

NOTE Confidence: 0.88685868

02:02:25.320 --> 02:02:27.060 probably the pixel classification

NOTE Confidence: 0.88685868

02:02:27.060 --> 02:02:28.800 might work really well.

NOTE Confidence: 0.88685868

02:02:28.800 --> 02:02:30.192 I've used that on a number

NOTE Confidence: 0.88685868

02:02:30.192 --> 02:02:31.520 of occasions to kind of say,

NOTE Confidence: 0.88685868

02:02:31.520 --> 02:02:34.930 you know, what if I were to open

NOTE Confidence: 0.88685868

02:02:34.930 --> 02:02:38.780 up a data set like here and say,

NOTE Confidence: 0.88685868

02:02:38.780 --> 02:02:40.920 you know what, I want to measure

NOTE Confidence: 0.88685868

02:02:40.920 --> 02:02:42.480 the size of this whole structure,

NOTE Confidence: 0.88685868

02:02:42.480 --> 02:02:45.080 not just the cells, not just the cells.

NOTE Confidence: 0.88685868

02:02:45.080 --> 02:02:46.116 I want to measure the whole cell,

NOTE Confidence: 0.88685868

02:02:46.120 --> 02:02:48.492 including all the intercellular

NOTE Confidence: 0.88685868

02:02:48.492 --> 02:02:49.678 space essentially.

NOTE Confidence: 0.88685868

02:02:49.680 --> 02:02:52.596 So I would, you know again come up here.

NOTE Confidence: 0.88685868

02:02:52.600 --> 02:02:54.252 I'd probably do a little bit of

NOTE Confidence: 0.88685868

02:02:54.252 --> 02:02:54.960 smoothing background strand,

NOTE Confidence: 0.88685868

02:02:54.960 --> 02:02:57.960 I'd probably do all channels come in here.

NOTE Confidence: 0.88685868

02:02:57.960 --> 02:02:59.720 I can train it and say you know what I'm

NOTE Confidence: 0.88685868

02:02:59.774 --> 02:03:01.718 going to make it pretty broad here and I'll,

NOTE Confidence: 0.88685868

02:03:01.720 --> 02:03:02.120 you know,

NOTE Confidence: 0.88685868

02:03:02.120 --> 02:03:04.279 I come up here and is it going to let me,

NOTE Confidence: 0.88685868

02:03:04.280 --> 02:03:05.318 it's not going to let me.

NOTE Confidence: 0.88685868

02:03:05.320 --> 02:03:07.000 Sorry, didn't try to reopen,

NOTE Confidence: 0.88685868

02:03:07.000 --> 02:03:07.180 sorry.

NOTE Confidence: 0.88685868

02:03:07.180 --> 02:03:07.360 So

NOTE Confidence: 0.951296489230769

02:03:13.240 --> 02:03:15.305 I can come up here and I

NOTE Confidence: 0.951296489230769

02:03:15.305 --> 02:03:16.919 would just train it to say

NOTE Confidence: 0.594941845555556

02:03:22.520 --> 02:03:23.639 takes it here,

NOTE Confidence: 0.594941845555556

02:03:23.639 --> 02:03:26.210 it's going to let me draw oh sorry,

NOTE Confidence: 0.594941845555556

02:03:26.210 --> 02:03:27.035 I'm on the wrong button.

NOTE Confidence: 0.594941845555556

02:03:27.040 --> 02:03:28.440 So yeah I do that all the time.

NOTE Confidence: 0.594941845555556

02:03:28.440 --> 02:03:30.036 Make sure you're on the the,

NOTE Confidence: 0.594941845555556

02:03:30.040 --> 02:03:31.240 not on the circle select,

NOTE Confidence: 0.594941845555556

02:03:31.240 --> 02:03:33.277 but on the on the thing here.

NOTE Confidence: 0.594941845555556

02:03:33.280 --> 02:03:34.120 But anyway, you can come up here.

NOTE Confidence: 0.594941845555556

02:03:34.120 --> 02:03:36.150 You're going to train this as a

NOTE Confidence: 0.594941845555556

02:03:36.150 --> 02:03:37.763 signal and you come up here and you

NOTE Confidence: 0.594941845555556

02:03:37.763 --> 02:03:39.284 can train this as background, right?

NOTE Confidence: 0.594941845555556

02:03:39.284 --> 02:03:40.988 And you get you'll get a

NOTE Confidence: 0.594941845555556

02:03:40.988 --> 02:03:42.599 whole a whole oops sorry,

NOTE Confidence: 0.600895378

02:03:45.880 --> 02:03:48.312 background. Train it as

NOTE Confidence: 0.600895378

02:03:48.312 --> 02:03:51.080 background and you can get.

NOTE Confidence: 0.600895378

02:03:51.080 --> 02:03:53.156 Hopefully if you train it right,

NOTE Confidence: 0.600895378

02:03:53.160 --> 02:03:54.699 you'll get one,

NOTE Confidence: 0.600895378

02:03:54.699 --> 02:03:59.040 one big BLOB including everything.

NOTE Confidence: 0.600895378

02:03:59.040 --> 02:04:00.524 And again, a lot of times there's

NOTE Confidence: 0.600895378

02:04:00.524 --> 02:04:01.406 auto fluorescence and things

NOTE Confidence: 0.600895378

02:04:01.406 --> 02:04:02.600 like that that get picked up.

NOTE Confidence: 0.600895378

02:04:02.600 --> 02:04:04.030 And clearly background is background

NOTE Confidence: 0.600895378

02:04:04.030 --> 02:04:05.460 and you'll get something that

NOTE Confidence: 0.600895378

02:04:05.510 --> 02:04:06.734 looks like this that'll be able

NOTE Confidence: 0.600895378

02:04:06.734 --> 02:04:08.460 to kind of give you that idea of

NOTE Confidence: 0.600895378

02:04:08.460 --> 02:04:09.960 that one big volume structure.

NOTE Confidence: 0.600895378

02:04:09.960 --> 02:04:12.192 And then then you can just go here

NOTE Confidence: 0.600895378

02:04:12.192 --> 02:04:14.140 and look at total volume down here

NOTE Confidence: 0.600895378

02:04:14.140 --> 02:04:15.160 and that'll give you the shape,

NOTE Confidence: 0.600895378

02:04:15.160 --> 02:04:17.200 total size of the the embryo.

NOTE Confidence: 0.600895378

02:04:17.200 --> 02:04:18.719 Again just depends on the data set,

NOTE Confidence: 0.600895378

02:04:18.720 --> 02:04:20.712 but that that is pretty easy way of

NOTE Confidence: 0.600895378

02:04:20.712 --> 02:04:22.918 doing it through pixel classification.

NOTE Confidence: 0.600895378

02:04:22.920 --> 02:04:24.280 You might be able to even do it

NOTE Confidence: 0.600895378

02:04:24.280 --> 02:04:25.279 through just intensity based.

NOTE Confidence: 0.600895378

02:04:25.280 --> 02:04:28.038 Again a lot of times auto fluorescence

NOTE Confidence: 0.600895378

02:04:28.040 --> 02:04:30.210 can be your friend in terms of

NOTE Confidence: 0.600895378

02:04:30.210 --> 02:04:32.596 rendering kind of a whole cell object.

NOTE Confidence: 0.600895378

02:04:32.600 --> 02:04:34.040 I use that on many occasions and say,

NOTE Confidence: 0.600895378

02:04:34.040 --> 02:04:35.102 hey, you know what the auto

NOTE Confidence: 0.600895378

02:04:35.102 --> 02:04:36.120 fluorescence in that one channel,

NOTE Confidence: 0.600895378

02:04:36.120 --> 02:04:37.824 even though I don't think it's

NOTE Confidence: 0.600895378

02:04:37.824 --> 02:04:38.884 good for this segmentation,

NOTE Confidence: 0.600895378

02:04:38.884 --> 02:04:40.989 I can use it to kind of render the whole

NOTE Confidence: 0.600895378

02:04:40.989 --> 02:04:42.515 cell that's I've used that on many,

NOTE Confidence: 0.600895378

02:04:42.520 --> 02:04:45.238 many different occasions.

NOTE Confidence: 0.600895378

02:04:45.240 --> 02:04:47.560 OK And last one here.

NOTE Confidence: 0.600895378

02:04:47.560 --> 02:04:49.060 Is there a way of visualizing

NOTE Confidence: 0.600895378

02:04:49.060 --> 02:04:50.869 shells in a nucleus as the distance

NOTE Confidence: 0.600895378

02:04:50.869 --> 02:04:52.619 from the center of the nucleus to

NOTE Confidence: 0.600895378

02:04:52.679 --> 02:04:54.439 how far is this are away from the

NOTE Confidence: 0.600895378

02:04:54.439 --> 02:04:56.200 center or the edge of a nucleus?

NOTE Confidence: 0.600895378

02:04:56.200 --> 02:04:56.982 Oh gosh,

NOTE Confidence: 0.600895378

02:04:56.982 --> 02:04:59.328 you are jumping into a totally

NOTE Confidence: 0.600895378

02:04:59.328 --> 02:05:02.036 module that I didn't get into today.

NOTE Confidence: 0.600895378

02:05:02.040 --> 02:05:03.996 So the short answer is yes,

NOTE Confidence: 0.600895378

02:05:04.000 --> 02:05:05.212 we can do that,

NOTE Confidence: 0.600895378

02:05:05.212 --> 02:05:08.400 but it is using a module called Amar cell.

NOTE Confidence: 0.600895378

02:05:08.400 --> 02:05:11.452 It's this guy up here where you would

NOTE Confidence: 0.600895378

02:05:11.452 --> 02:05:15.080 actually do a detection of the whole cell,

NOTE Confidence: 0.600895378

02:05:15.080 --> 02:05:18.000 you would do a detection of the nuclei

NOTE Confidence: 0.600895378

02:05:18.000 --> 02:05:20.952 and then you can measure objects

NOTE Confidence: 0.600895378

02:05:20.952 --> 02:05:23.390 relative to that nuclei and measure

NOTE Confidence: 0.600895378

02:05:23.390 --> 02:05:25.035 how close they are to the center,

NOTE Confidence: 0.600895378

02:05:25.040 --> 02:05:26.958 how close they are to the membrane.

NOTE Confidence: 0.600895378

02:05:26.960 --> 02:05:28.574 And there's a lot of different

NOTE Confidence: 0.600895378

02:05:28.574 --> 02:05:30.239 parameters there that we can measure

NOTE Confidence: 0.600895378

02:05:30.240 --> 02:05:33.320 relative to the edge of the nucleus,

NOTE Confidence: 0.600895378

02:05:33.320 --> 02:05:36.274 but it's you can do it separately

NOTE Confidence: 0.600895378

02:05:36.274 --> 02:05:38.320 I suppose as well. But the Mr.

NOTE Confidence: 0.600895378

02:05:38.320 --> 02:05:41.434 cell module is, is the way to go basically.

NOTE Confidence: 0.600895378

02:05:41.440 --> 02:05:42.610 I can show you really quickly

NOTE Confidence: 0.600895378

02:05:42.610 --> 02:05:43.958 I don't want to get into it.

NOTE Confidence: 0.600895378

02:05:43.960 --> 02:05:44.310 But again,

NOTE Confidence: 0.600895378

02:05:44.310 --> 02:05:45.535 I think if you have a specific

NOTE Confidence: 0.600895378

02:05:45.535 --> 02:05:45.960 question there,

NOTE Confidence: 0.600895378

02:05:45.960 --> 02:05:47.245 again I can cover everything

NOTE Confidence: 0.600895378

02:05:47.245 --> 02:05:48.920 in a lot of detail today.

NOTE Confidence: 0.600895378

02:05:48.920 --> 02:05:52.570 Let me see if I can find dumb,

NOTE Confidence: 0.600895378

02:05:52.570 --> 02:05:54.400 dumb example here.

NOTE Confidence: 0.81629513

02:05:57.200 --> 02:06:00.773 This guy here, I guess, right?

NOTE Confidence: 0.81629513

02:06:00.773 --> 02:06:03.438 So this is a cell.

NOTE Confidence: 0.81629513

02:06:03.440 --> 02:06:05.198 Let's just say come in here.

NOTE Confidence: 0.81629513

02:06:05.200 --> 02:06:06.760 I think I can build this

NOTE Confidence: 0.81629513

02:06:06.760 --> 02:06:08.040 really quick. See here.

NOTE Confidence: 0.81629513

02:06:08.040 --> 02:06:11.000 See this guy here? So we do.

NOTE Confidence: 0.87485866875

02:06:13.120 --> 02:06:14.800 The nuclei is blue.

NOTE Confidence: 0.87485866875

02:06:14.800 --> 02:06:17.280 You come in here, you're

NOTE Confidence: 0.87485866875

02:06:17.280 --> 02:06:20.419 going to segment the nuclei.

NOTE Confidence: 0.87485866875

02:06:20.419 --> 02:06:21.958 It's not working.

NOTE Confidence: 0.565861045

02:06:26.560 --> 02:06:28.744 Hold on, let me start over.

NOTE Confidence: 0.565861045

02:06:28.744 --> 02:06:30.240 I'm not sure why it's not working.

NOTE Confidence: 0.565861045

02:06:30.240 --> 02:06:32.039 It's not showing up in the threshold.

NOTE Confidence: 0.33173692

02:06:36.560 --> 02:06:36.680 There

NOTE Confidence: 0.700043134285714

02:06:41.920 --> 02:06:43.999 we go, Right. So there's our nuclei.

NOTE Confidence: 0.724093396666667

02:06:46.680 --> 02:06:49.158 One big nuclei.

NOTE Confidence: 0.724093396666667

02:06:49.160 --> 02:06:52.612 We have our cell for big cell labeling.

NOTE Confidence: 0.724093396666667

02:06:52.612 --> 02:06:55.390 Here again, I'm not going to do

NOTE Confidence: 0.724093396666667

02:06:55.390 --> 02:06:57.473 super duper fancy here, right?

NOTE Confidence: 0.724093396666667

02:06:57.473 --> 02:07:00.030 So there's our cell and then we

NOTE Confidence: 0.724093396666667

02:07:00.030 --> 02:07:01.800 have some vesicles in the cells.

NOTE Confidence: 0.724093396666667

02:07:01.800 --> 02:07:05.696 So I come in here, turn this guy off,

NOTE Confidence: 0.724093396666667

02:07:05.696 --> 02:07:08.324 We can detect, we can detect spots.

NOTE Confidence: 0.724093396666667

02:07:08.324 --> 02:07:10.079 That's probably the easiest way to do it.

NOTE Confidence: 0.724093396666667

02:07:10.080 --> 02:07:12.000 So you have a whole bunch of spots

NOTE Confidence: 0.724093396666667

02:07:12.000 --> 02:07:13.584 within the structure and then you

NOTE Confidence: 0.724093396666667

02:07:13.584 --> 02:07:15.439 have a whole ton of statistics.

NOTE Confidence: 0.724093396666667

02:07:15.440 --> 02:07:16.798 Now again, you have a cell option.

NOTE Confidence: 0.724093396666667

02:07:16.800 --> 02:07:18.690 Now the visualization of the Marcel

NOTE Confidence: 0.724093396666667

02:07:18.690 --> 02:07:19.988 module is. It should be desired.

NOTE Confidence: 0.724093396666667

02:07:19.988 --> 02:07:20.823 It's not quite the same

NOTE Confidence: 0.724093396666667

02:07:20.823 --> 02:07:21.800 as the surface rendering,

NOTE Confidence: 0.724093396666667

02:07:21.800 --> 02:07:23.516 but the statistics are all there.

NOTE Confidence: 0.724093396666667

02:07:23.520 --> 02:07:25.599 So there's the cell, there's your vesicles,

NOTE Confidence: 0.724093396666667

02:07:25.600 --> 02:07:26.830 there's your nuclei.

NOTE Confidence: 0.724093396666667

02:07:26.830 --> 02:07:28.880 All the statistics are here.

NOTE Confidence: 0.724093396666667

02:07:28.880 --> 02:07:30.518 You can look at these statistics on the Mr.

NOTE Confidence: 0.724093396666667

02:07:30.520 --> 02:07:31.656 cell feature.

NOTE Confidence: 0.724093396666667

02:07:31.656 --> 02:07:34.520 So for example, cell

NOTE Confidence: 0.619389886

02:07:36.760 --> 02:07:40.600 vesicle. Where's the vesicle? Vesicle.

NOTE Confidence: 0.619389886

02:07:40.600 --> 02:07:43.276 Distance? Maybe I haven't turned on.

NOTE Confidence: 0.354214001666667

02:07:47.640 --> 02:07:48.276 Yeah, I can turn it on,

NOTE Confidence: 0.354214001666667

02:07:48.280 --> 02:07:50.597 but there's a lot of statistics here.

NOTE Confidence: 0.354214001666667

02:07:50.600 --> 02:07:53.856 So that's fulls. So distance.

NOTE Confidence: 0.354214001666667

02:07:53.856 --> 02:07:55.312 Here it is. Yeah.

NOTE Confidence: 0.354214001666667

02:07:55.312 --> 02:07:57.080 So distance to cell, membrane distance,

NOTE Confidence: 0.354214001666667

02:07:57.080 --> 02:07:59.580 the closest nucleus distance, nucleus center.

NOTE Confidence: 0.354214001666667

02:07:59.580 --> 02:08:02.450 So there's a lot of different parameters

NOTE Confidence: 0.354214001666667

02:08:02.450 --> 02:08:04.710 here that you can export out and

NOTE Confidence: 0.354214001666667

02:08:04.710 --> 02:08:07.039 get some cell to cell statistics.

NOTE Confidence: 0.354214001666667

02:08:07.040 --> 02:08:08.874 Now the challenge here is to do

NOTE Confidence: 0.354214001666667

02:08:08.874 --> 02:08:10.320 the rendering inside of a Marcel.

NOTE Confidence: 0.354214001666667

02:08:10.320 --> 02:08:11.508 It works really well.

NOTE Confidence: 0.354214001666667

02:08:11.508 --> 02:08:12.993 You can also import surfaces

NOTE Confidence: 0.354214001666667

02:08:12.993 --> 02:08:14.159 into a Marcel there.

NOTE Confidence: 0.354214001666667

02:08:14.160 --> 02:08:15.480 There's an import process here.

NOTE Confidence: 0.354214001666667

02:08:15.480 --> 02:08:17.640 So if you did your segmentation in surfaces,

NOTE Confidence: 0.354214001666667

02:08:17.640 --> 02:08:19.278 you can import them into a Marcel.

NOTE Confidence: 0.354214001666667

02:08:19.280 --> 02:08:20.720 Sometimes that's not super efficient,

NOTE Confidence: 0.354214001666667

02:08:20.720 --> 02:08:22.728 but it can get definitely get the job

NOTE Confidence: 0.354214001666667

02:08:22.728 --> 02:08:25.008 done and get you those statistics that

NOTE Confidence: 0.354214001666667

02:08:25.008 --> 02:08:27.080 are automatically calculated for you.

NOTE Confidence: 0.354214001666667

02:08:27.080 --> 02:08:29.320 So I think I'm going to stop there.

NOTE Confidence: 0.354214001666667

02:08:29.320 --> 02:08:30.508 I know we went really long

NOTE Confidence: 0.354214001666667

02:08:30.508 --> 02:08:31.959 here and we got a late start,

NOTE Confidence: 0.354214001666667

02:08:31.960 --> 02:08:33.994 but I think I got to all the questions.

NOTE Confidence: 0.354214001666667

02:08:34.000 --> 02:08:37.252 I think my my biggest and I appreciate you

NOTE Confidence: 0.354214001666667

02:08:37.252 --> 02:08:39.557 all kind of sticking with me to the end here.

NOTE Confidence: 0.354214001666667

02:08:39.560 --> 02:08:40.972 As I said before,

NOTE Confidence: 0.354214001666667

02:08:40.972 --> 02:08:43.090 you guys have a maintenance contract

NOTE Confidence: 0.354214001666667

02:08:43.157 --> 02:08:45.233 with the core facility gives you

NOTE Confidence: 0.354214001666667

02:08:45.233 --> 02:08:47.798 access to myself and our support team.

NOTE Confidence: 0.354214001666667

02:08:47.800 --> 02:08:50.184 Whenever you have a question on using the

NOTE Confidence: 0.354214001666667

02:08:50.184 --> 02:08:52.198 software with a particular application,

NOTE Confidence: 0.354214001666667

02:08:52.200 --> 02:08:53.226 I'll be more than happy to

NOTE Confidence: 0.354214001666667

02:08:53.226 --> 02:08:54.360 kind of ask for that data,

NOTE Confidence: 0.354214001666667

02:08:54.360 --> 02:08:55.760 walk you through it one-on-one.

NOTE Confidence: 0.354214001666667

02:08:55.760 --> 02:08:57.860 Please just reach out to send

NOTE Confidence: 0.354214001666667

02:08:57.860 --> 02:08:58.960 an e-mail to your support,

NOTE Confidence: 0.354214001666667

02:08:58.960 --> 02:08:59.880 tell me who you are.

NOTE Confidence: 0.354214001666667

02:08:59.880 --> 02:09:02.478 Tell me who's license you're using

NOTE Confidence: 0.354214001666667

02:09:02.480 --> 02:09:04.196 and things like that with you.

NOTE Confidence: 0.354214001666667

02:09:04.200 --> 02:09:06.712 Any any of you want any more information

NOTE Confidence: 0.354214001666667

02:09:06.712 --> 02:09:09.278 on the modules that I didn't cover,

NOTE Confidence: 0.354214001666667

02:09:09.280 --> 02:09:10.368 Again, please reach out.

NOTE Confidence: 0.354214001666667

02:09:10.368 --> 02:09:12.347 I think you guys have all of

NOTE Confidence: 0.354214001666667

02:09:12.347 --> 02:09:13.797 the modules available to you,

NOTE Confidence: 0.354214001666667

02:09:13.800 --> 02:09:15.389 so there's a lot of different options

NOTE Confidence: 0.354214001666667

02:09:15.389 --> 02:09:17.079 out there to to analyze your data.

NOTE Confidence: 0.354214001666667

02:09:17.080 --> 02:09:18.914 And I'm more than happy to have

NOTE Confidence: 0.354214001666667

02:09:18.914 --> 02:09:20.604 conversations and teach you some of the

NOTE Confidence: 0.354214001666667

02:09:20.604 --> 02:09:22.319 things that hey maybe you can do this,

NOTE Confidence: 0.354214001666667

02:09:22.320 --> 02:09:24.596 maybe you can do that and try to get

NOTE Confidence: 0.354214001666667

02:09:24.596 --> 02:09:26.281 maybe some things that you didn't think

NOTE Confidence: 0.354214001666667

02:09:26.281 --> 02:09:28.115 about for your for your data analysis.

NOTE Confidence: 0.93635179

02:09:30.240 --> 02:09:32.676 So I appreciate your time and effort.

NOTE Confidence: 0.93635179

02:09:32.680 --> 02:09:34.813 I know this is a a long meeting but

NOTE Confidence: 0.93635179

02:09:34.813 --> 02:09:36.480 hopefully it gives you an idea of of

NOTE Confidence: 0.93635179

02:09:36.480 --> 02:09:38.076 what you can do with the software.

NOTE Confidence: 0.93635179

02:09:38.080 --> 02:09:39.624 When you go down and sit in front

NOTE Confidence: 0.93635179

02:09:39.624 --> 02:09:41.454 of it you you'll have a a thing you

NOTE Confidence: 0.93635179

02:09:41.454 --> 02:09:42.925 will get a video automatically I

NOTE Confidence: 0.93635179

02:09:42.925 --> 02:09:44.836 think at the end of this meeting.

NOTE Confidence: 0.93635179

02:09:44.840 --> 02:09:45.862 I don't know how long it takes

NOTE Confidence: 0.93635179

02:09:45.862 --> 02:09:46.719 to get that video sent,

NOTE Confidence: 0.93635179

02:09:46.720 --> 02:09:48.295 but if you signed up and registered

NOTE Confidence: 0.93635179

02:09:48.295 --> 02:09:49.584 you should get an automatic

NOTE Confidence: 0.93635179

02:09:49.584 --> 02:09:50.999 video recording of the session.

NOTE Confidence: 0.93635179

02:09:51.000 --> 02:09:52.477 If you don't please let me know.

NOTE Confidence: 0.93635179

02:09:52.480 --> 02:09:53.640 I think I'm going to get one too.

NOTE Confidence: 0.93635179

02:09:53.640 --> 02:09:55.398 So hopefully if I get it,

NOTE Confidence: 0.93635179

02:09:55.400 --> 02:09:56.597 you guys will get it as well.

NOTE Confidence: 0.93635179

02:09:56.600 --> 02:09:58.640 But I'll have the recording

NOTE Confidence: 0.93635179

02:09:58.640 --> 02:10:00.680 available if if you don't,

NOTE Confidence: 0.93635179

02:10:00.680 --> 02:10:02.486 if you don't get that link to

NOTE Confidence: 0.93635179

02:10:02.486 --> 02:10:04.136 the to the video. All right.

NOTE Confidence: 0.93635179

02:10:04.136 --> 02:10:05.592 Well, I hope that is what you

NOTE Confidence: 0.93635179

02:10:05.592 --> 02:10:07.440 were hoping for, Matthias.

NOTE Confidence: 0.93635179

02:10:07.440 --> 02:10:09.600 Yeah, sure.

NOTE Confidence: 0.93635179

02:10:09.600 --> 02:10:12.416 Hopefully it gives you guys a a good

NOTE Confidence: 0.93635179

02:10:12.416 --> 02:10:14.714 starting point for a lot of different

NOTE Confidence: 0.93635179

02:10:14.714 --> 02:10:17.478 tools out there to to use our software.

NOTE Confidence: 0.93635179

02:10:17.480 --> 02:10:18.108 All right.

NOTE Confidence: 0.93635179

02:10:18.108 --> 02:10:20.620 So I guess we should just all thanks

NOTE Confidence: 0.93635179

02:10:20.688 --> 02:10:22.932 Matthew for dedicating so much time

NOTE Confidence: 0.93635179

02:10:22.932 --> 02:10:25.206 and covering so much material and

NOTE Confidence: 0.93635179

02:10:25.206 --> 02:10:27.684 it's great that we we have this

NOTE Confidence: 0.93635179

02:10:27.684 --> 02:10:29.880 starting point and as Matthew said,

NOTE Confidence: 0.93635179

02:10:29.880 --> 02:10:31.320 we have a maintenance contract,

NOTE Confidence: 0.93635179

02:10:31.320 --> 02:10:33.264 you guys can always reach out

NOTE Confidence: 0.93635179

02:10:33.264 --> 02:10:34.236 to the supporter.

NOTE Confidence: 0.93635179

02:10:34.240 --> 02:10:36.442 Demarius just mentioned that the license

NOTE Confidence: 0.93635179

02:10:36.442 --> 02:10:39.520 is CCMI and it's under my name I believe.

NOTE Confidence: 0.93635179

02:10:39.520 --> 02:10:41.990 So he knows how to to route

NOTE Confidence: 0.93635179

02:10:41.990 --> 02:10:44.240 that and and as I said,

NOTE Confidence: 0.93635179

02:10:44.240 --> 02:10:44.759 he's going to,

NOTE Confidence: 0.93635179

02:10:44.759 --> 02:10:45.797 you're going to get a recording.

NOTE Confidence: 0.93635179

02:10:45.800 --> 02:10:48.728 And we hope that this has been very

NOTE Confidence: 0.93635179

02:10:48.728 --> 02:10:52.152 useful to all of you as it has been to me.

NOTE Confidence: 0.93635179

02:10:52.160 --> 02:10:54.116 And I'm looking forward to working

NOTE Confidence: 0.93635179

02:10:54.116 --> 02:10:56.324 more with you and with more

NOTE Confidence: 0.93635179

02:10:56.324 --> 02:10:57.996 advance from Marty's features.

NOTE Confidence: 0.93635179

02:10:58.000 --> 02:10:58.195 Yeah.

NOTE Confidence: 0.93635179

02:10:58.195 --> 02:10:58.390 Yeah.

NOTE Confidence: 0.93635179

02:10:58.390 --> 02:10:59.365 You're more than welcome to

NOTE Confidence: 0.93635179

02:10:59.365 --> 02:11:00.358 have sessions with me as well.

NOTE Confidence: 0.93635179

02:11:00.360 --> 02:11:01.482 If you want to learn anything

NOTE Confidence: 0.93635179

02:11:01.482 --> 02:11:02.701 about what we covered more detail

NOTE Confidence: 0.93635179

02:11:02.701 --> 02:11:03.960 and get more technical, we can.

NOTE Confidence: 0.93635179

02:11:03.960 --> 02:11:05.800 We can do that as well. Yeah.

NOTE Confidence: 0.93635179

02:11:05.800 --> 02:11:06.440 Great.

NOTE Confidence: 0.93635179

02:11:06.440 --> 02:11:07.080 Great.

NOTE Confidence: 0.93635179

02:11:07.080 --> 02:11:09.800 So, yeah, everybody, thank you very much.

NOTE Confidence: 0.93635179

02:11:09.800 --> 02:11:11.608 And Matthew, I wanted to chat with you

NOTE Confidence: 0.93635179

02:11:11.608 --> 02:11:13.320 a couple minutes if you have time,

NOTE Confidence: 0.93635179

02:11:13.320 --> 02:11:17.355 but I don't know if you want to call me.

NOTE Confidence: 0.93635179

02:11:17.360 --> 02:11:18.640 Do you mind calling me? Oh, yeah.

NOTE Confidence: 0.93635179

02:11:18.640 --> 02:11:20.108 I can give you a call. Yeah.

NOTE Confidence: 0.93635179

02:11:20.108 --> 02:11:22.436 OK Let me just send you.

NOTE Confidence: 0.93635179

02:11:22.440 --> 02:11:24.520 Let me just send you the number here.

NOTE Confidence: 0.728138582

02:11:29.040 --> 02:11:32.240 OK. All right, guys. Yeah.

NOTE Confidence: 0.728138582

02:11:32.240 --> 02:11:33.405 Thank you. I don't know, Matthew,

NOTE Confidence: 0.728138582

02:11:33.405 --> 02:11:35.355 if you can end the session.

NOTE Confidence: 0.728138582

02:11:35.360 --> 02:11:37.335 I end the session. So, yeah, I'll end.

NOTE Confidence: 0.728138582

02:11:37.335 --> 02:11:38.155 I'll end the session.

NOTE Confidence: 0.728138582

02:11:38.160 --> 02:11:38.995 Yeah, I'm going to end it. OK.

NOTE Confidence: 0.728138582

02:11:38.995 --> 02:11:40.235 Yeah. I just send you on the chat,

NOTE Confidence: 0.728138582

02:11:40.240 --> 02:11:40.879 the phone number.

NOTE Confidence: 0.578071544545455

02:11:42.960 --> 02:11:43.344 Where's the chat?

NOTE Confidence: 0.578071544545455

02:11:43.344 --> 02:11:44.360 Let me make sure I can see it.

NOTE Confidence: 0.64276732125

02:11:46.800 --> 02:11:48.600 OK. Make sure I can copy that out.

NOTE Confidence: 0.851023882857143

02:11:51.680 --> 02:11:53.920 OK. All right. I'll call you shortly.

NOTE Confidence: 0.851023882857143

02:11:53.920 --> 02:11:55.848 OK. All right. Thank you, everyone.

NOTE Confidence: 0.851023882857143

02:11:55.848 --> 02:11:57.998 Have a great day. You too. Bye.