

WEBVTT Kind: captions Language: en

00:00:01.500 --> 00:00:04.750 - The prostate gland sits in a difficult location,
00:00:04.750 --> 00:00:06.420 and it's a soft organ.
00:00:06.420 --> 00:00:09.840 It's not like the skull where it's surrounded
00:00:09.840 --> 00:00:12.480 by a boney structure and you can pick sort of
points
00:00:12.480 --> 00:00:14.270 and triangulate very well because it's not moving.
00:00:14.270 --> 00:00:15.380 The prostate squishes.
00:00:15.380 --> 00:00:16.213 It rotates.
00:00:16.213 --> 00:00:17.610 It kind of moves all over in the pelvis,
00:00:17.610 --> 00:00:21.027 so it's a very difficult thing to biopsy.
00:00:25.600 --> 00:00:27.550 The normal ultrasound just kind of tells you
00:00:27.550 --> 00:00:28.660 where the prostate is,
00:00:28.660 --> 00:00:30.070 so we're using it just to make sure
00:00:30.070 --> 00:00:31.730 that we put needles in the prostate
00:00:31.730 --> 00:00:34.740 and not somewhere else in the pelvis.
00:00:34.740 --> 00:00:37.500 The MRI allows us to look inside the prostate
00:00:37.500 --> 00:00:39.080 for different lesions.
00:00:39.080 --> 00:00:41.380 - Both the MR image and the ultrasound
00:00:41.380 --> 00:00:44.790 show very different visualizations of the anatomy.
00:00:44.790 --> 00:00:47.370 The challenge is trying to map those two together,
00:00:47.370 --> 00:00:48.787 those two images.
00:00:53.370 --> 00:00:54.203 - [Dr. Sprenkle] With the addition
00:00:54.203 --> 00:00:56.770 of MR-Ultrasound Fusion targeted biopsies,
00:00:56.770 --> 00:00:59.390 we're able to much more accurately pinpoint
00:00:59.390 --> 00:01:01.552 those areas that are concerning.
00:01:01.552 --> 00:01:03.962 - [Dr. Onofrey] The value of merging these two
image
00:01:03.962 --> 00:01:08.400 modalities is to provide accurate biopsy guidance.
00:01:08.400 --> 00:01:10.240 - [Dr. Sprenkle] That overlapping of fusion tech-
nology

00:01:10.240 --> 00:01:13.490 sounds pretty simple, but it's actually quite complicated

00:01:13.490 --> 00:01:14.870 for several reasons.

00:01:14.870 --> 00:01:16.607 One of the main ones is that the prostate

00:01:16.607 --> 00:01:18.970 is deformable, so one of the things

00:01:18.970 --> 00:01:21.350 that we're actually doing in our research here

00:01:21.350 --> 00:01:25.550 is trying to predict how the prostate is going to move

00:01:25.550 --> 00:01:28.470 by understanding how it has moved in the past,

00:01:28.470 --> 00:01:31.600 and so that we can make sure that we're actually

00:01:31.600 --> 00:01:34.500 at the lesion and not a few millimeters away from it.

00:01:39.130 --> 00:01:41.730 - [Dr. Onofrey] We've learned from hundreds of cases

00:01:41.730 --> 00:01:43.270 that have come prior to this

00:01:43.270 --> 00:01:46.740 and with some manual training coming from Dr. Sprenkle,

00:01:46.740 --> 00:01:50.080 we're able to learn how the prostate will actually deform

00:01:50.080 --> 00:01:53.090 during this procedure and so we use that to guide

00:01:53.090 --> 00:01:57.028 the fusion of these two modalities in a constrained way.

00:01:57.028 --> 00:01:59.410 - As soon as I start talking to these men

00:01:59.410 --> 00:02:02.100 about a prostate biopsy, having a prostate biopsy,

00:02:02.100 --> 00:02:04.400 sort of empathizing with their discomfort

00:02:04.400 --> 00:02:06.540 with the idea of having an ultrasound probe in their rectum

00:02:06.540 --> 00:02:09.090 and a needle getting passed into their prostate,

00:02:09.090 --> 00:02:12.620 it becomes clear that we want to do better than that.

00:02:12.620 --> 00:02:16.560 By being able to improve our Ultrasound-MR Fusion

00:02:16.560 --> 00:02:17.890 and being able to model the prostate,

00:02:17.890 --> 00:02:20.630 we can improve our biopsy technique,
00:02:20.630 --> 00:02:24.750 so instead of potentially having to do 17 biopsies
00:02:24.750 --> 00:02:28.300 to collect all the tissue, we can do one.
00:02:28.300 --> 00:02:30.450 - [Dr. Onofrey] It's extremely fulfilling to actually
see
00:02:30.450 --> 00:02:33.600 these algorithms come out of the lab.
00:02:33.600 --> 00:02:36.210 It's a great example of translational research,
00:02:36.210 --> 00:02:38.920 bringing AI machine-learning techniques
00:02:38.920 --> 00:02:41.900 into the clinic where we could directly improve
00:02:41.900 --> 00:02:44.090 patient experience and hopefully improve
00:02:44.090 --> 00:02:46.923 the diagnosis of prostate cancer.