

BluHaptics

Safer and More Efficient Undersea Robotic Operations

Andy Stewart: We're down here on one of our research vessels today to work on the final stages of a small business innovative research project to develop what we call a collaborative sub-sea manipulation interface.

So what we have on the seafloor here is actually a robotic arm that's integrated into a test bed we've been working with for some time now.

Narrator: This 2014 video reported on the robotic arm and its control system developed by a team of scientists and engineers.

Stewart: What's unique about this project is our ability to combine the spatial awareness of a computer system with the perceptive capability of a human operator. We use what is called a haptic device.

Narrator: Haptics: tactile feedback technology that takes advantage of the sense of touch by applying forces, vibrations or motions to the user. Doing for the sense of touch what computer graphics do for vision.

Narrator: Now new sensors are vastly improving the robotic arm's ability to act as a functional extension of a human arm.

Stewart: What's really exciting is that we actually have a couple of advanced sensors that are allowing us to develop 3D demonstrations of that underwater environment.

Narrator: Much of the work involves adapting and integrating off-the-shelf technology.

Stewart: We also have a 3D sonar system that's developed and marketed by Teledyne BlueView. And then we have a really interesting laser scanning system that has been provided to us by 2G Robotics.

Narrator: The additional sensors enable advanced haptic controls, and enhanced 3D visualization.

Fredrik Ryden: I'm sitting here in my office and I'm controlling the manipulator that's actually down in the lake in Portage Bay right now.

Narrator: The additional sensors enable advanced haptic controls and enhanced 3D visualization.

Ryden: These tests have been a major success. The laser scanner can actually see underwater. And it turns out we can actually do this even in murky waters.

Stewart: This laser scanner actually casts a laser line across the environment and then images it with a camera and is able to get a point cloud, which is a 3D representation of what's in that space.

BluHaptics

Safer and More Efficient Undersea Robotic Operations

Ryden: Having that 3D data makes all the difference in the world. They can go in and unplug the connector as easily as if they were using their own hands, really.

Don Pickering: Going forward, this technology really connects spatial awareness and intelligence to control systems and in doing that, will revolutionize how we use subsea equipment and robotics. Right now, there's a high degree of inefficiency, failure and downtime that's associated with pilot error and our technology can make operations far safer and more efficient."

Narrator: The company — BluHaptics — is a UW startup. The robot arm project employs algorithms developed by the UW Department of Electrical Engineering. APL-UW provides expertise in robotics and ocean engineering.

Pickering: I've been an entrepreneur for 20 years. And this is my first company working with the University and the Applied Physics Lab. And I have to say, it's really made my job a lot easier.

The grant funding, the support and the gravitas of having APL behind us gives us instant credibility in the marketplace.

Science at Work for You.

This is APL — The Applied Physics Laboratory at the University of Washington in Seattle.