



Husky UGV is equipped with an ice augger to drill into the surface of the tailings ponds to collect soil samples.

SUCCESS STORY

Getting to the Bottom of Alberta's Tailings Deposit Ponds - with Robots.

The University of Alberta (UofA) boasts one of Canada's largest Mechanical Engineering departments and offers students learning through collaboration with internationally renowned researchers. PhD student Nicolas Olmedo conducts research for UofA's Integrated Reliable Oil Sands Systems Lab (IROSSL) and works in tandem with Copperstone Technologies, an organization that provides engineering services in embedded systems, remote sensing, and robotics. Olmedo's research investigates oil sands tailings deposits to gain a more thorough understanding of the safety and transformation of tailings deposits over a period of time.

Before Clearpath Robotics

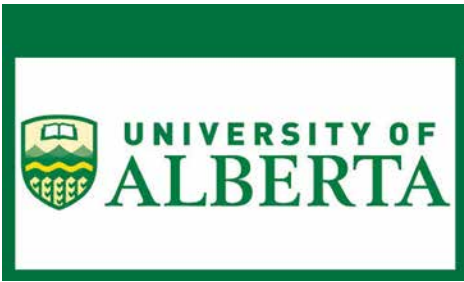
A tailings deposit pond is a pool of mud deposits that have been left to dry out. Plans to reclaim and develop the sites in Alberta have been delayed since deposits are taking much longer than expected to dry. The IROSSL is currently researching soil properties through sample collection in order to determine how tailings deposits change and dry over time.

"Traditional methods for soil collection are completed by human operators - they are labor intensive, expensive, unreliable, and not accurate," said Olmedo. "Most importantly, you can't do it every day, so the information is not received in a timely manner." In other words, manual methods do not provide consistent data.

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Recognizing the need for precision, and the importance of constant interaction with the surface of the tailings deposit pond for accurate reporting, Olmedo's team proposed the use of robotic systems to conduct the work. It was at this time that UofA and Copperstone Technologies turned to Clearpath Robotics for a system that could effectively be used for the research; the team purchased a Husky Unmanned Ground Vehicle (UGV).

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The Clearpath Advantage

Husky was an ideal platform for their testing because of its ability to handle uneven terrain and take on a variety of application-specific payloads, including modified sensory instruments for soil sampling to determine solid parameter estimation and real-time data collection.

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Husky enabled Olmedo’s team to collect and analyze soil samples more



UofA and Copperstone Technologies outfitted Husky with heavy treads to handle the harsh environment.

efficiently and in less time than previously; “Working with the Husky platform has been great! It was really easy to setup,” says Olmedo.

Additionally, the platform’s open-source compatibility with the Robot Operating System (ROS) helped to get research to the field much faster than expected.

“The sensor integration, monitoring systems, estimation algorithms, and tele-operation were all done using ROS,” he added.

Results

Since purchasing Husky, Olmedo has successfully navigated through several field trials in existing tailings deposit ponds to remotely collect accurate soil estimation data and soil samples. “Husky survived being on several tailings deposits,” says Olmedo.

The research teams at the University of Alberta and Copperstone Technologies have since presented a successful technology demonstration in Fort McMurray, Alberta, for some of Canada’s top ranked organizations within the oil sands industry.

Oil sands operators have expressed an interest in continuing to work with the team and are eager to see the research progress.

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With regard to his personal experience working with Clearpath Robotics Olmedo says, “The team at Clearpath has been really quick to reply to my support questions. They always show a willingness to make sure everything is okay. Every time I’ve contacted them it’s been a great experience!”



Nicolas Olmedo stands next to the soil sampling robot during a field test.

About Clearpath Robotics

Clearpath Robotics, a global leader in unmanned vehicle robotics for research and development, is dedicated to automating the world’s dullest, dirtiest, and deadliest jobs. The Company serves robotics leaders in over 30 countries worldwide in academic, corporate, industrial, and military environments. Visit us at www.clearpathrobotics.com to learn more or call us at 1-800-301-3863 to speak with an applications engineer.