Edmonton Innovator Wins Award for First-of-its-Kind Cleantech Robot that Does Industrial Dirty Work for Humans

Up-and-coming company aims to keep people out of harm by using robots to traverse hazardous terrains

Edmonton, AB — June 2, 2022 — Nicolas Olmedo is on a mission to keep people safe by sending robots where no human should ever have to go: into the murky, muddy sludge of industrial mine tailing ponds and other hazardous terrains that need to be continually monitored.

His ground-breaking work to develop intelligent robots capable of traversing mud, snow, ice or rock using screw-shaped pontoons has earned Olmedo a prestigious award from Mitacs, a national innovation organization that fosters growth by solving business challenges with research solutions from academic institutions.

In recognition of his efforts to advance the robots through his company, Copperstone Technologies Ltd., Olmedo — one of three Copperstone co-founders who completed his PhD in Mechanical Engineering at the University of Alberta — will be presented the Mitacs Outstanding Entrepreneur Award on June 2 at a ceremony in Montreal.

“It’s critical that industrial companies and mines continually monitor their waste areas, to measure their progress on environmental mitigation and remediation, yet the terrain involved is extremely dangerous,” said Olmedo, explaining that it’s like trying to move through thick, black honey, which makes travel with wheels, tracks and boat propellers impossible.

Even if floating excavators are used to carry a team of geotechnical experts out into the middle of a waste pond, the process is time-consuming, costly and there’s always the risk of getting stuck, meaning a backup crew must be on standby. “We thought, instead of trying to send people, why aren’t we sending robots?” he added.

The company’s HELIX family of amphibious cleantech robots – which can be remotely controlled by a human or programmed to operate autonomously – use a patented combination of screw-propulsion and four-wheel drive technologies to float on water or scroll across any terrain, no matter how wet, muddy, snowy or sticky. At the same time, they’re equipped with state-of-the-art tools to collect mud or water samples, and perform geotechnical measurements required to monitor environmental clean-up efforts.

“Our robots can go out into these hazardous waste areas and successfully collect samples from under the surface of tailings,” he said, noting that in some cases, the robots collect data that would be impossible to gather otherwise. “Our samples allow our customers to analyze everything from the composition of their waste material, to how much water is trapped in the sludge, to how much residual bitumen is present,” he explained.

HELIX robots can be purchased directly or contracted out as a robot-as-a-service, in which case Copperstone employees are responsible for deploying and operating them. In

both instances, the machines are customized for each specific industrial application, including water surveys, water profiling, water and sediment sampling, geotechnical surveys, or assessing ice thickness, necessary to ensure the safety of ice roads in winter, for example.

Because materials and terrains are unique to each application, the company operates like a Formula One pit crew, continually improving the performance of their robots through small adjustments after each job. “We’re a young company, so we’re constantly refining our procedures,” said Olmedo, explaining that a task might require 10 buttons to be pushed the first time it’s tackled, but ultimately the goal is “to make the robot so intelligent, no buttons are required.”

With the global mine waste management market forecast to grow to more than 208 billion tons by 2028, the company is on track to achieve multimillion-dollar revenues in the coming years, and has already grown from a small team of three founders in 2014 to 18 employees today. Though they started out to tackle problems unique to the oil sands in their own backyard, they now have a global reach, working with industrial companies that have locations throughout Canada, the U.S., Europe, Africa, Australia, Brazil and Peru.

“In many cases, industrial waste is considered a ticking time bomb and there’s a huge push to do a better job of environmental monitoring,” said Olmedo. “We’re providing a solution that is accurate, affordable and most importantly, keeps people safe, so that ultimately these hazardous sites can be reclaimed and returned to their original state.”

Olmedo is one of five winners of the Mitacs Entrepreneur Award who are being recognized for their efforts to turn their research into an innovative business that impacts the lives of Canadians.

“Mitacs has been invaluable in helping to build my company, allowing me to keep connected to the best the university has to offer, as well as understanding and supporting my needs as an entrepreneur,” Olmedo said.

“Mitacs is committed to helping up-and-coming innovators through their entrepreneurial journey, and we’re extremely proud of the remarkable accomplishments of each of this year’s award winners,” said Mitacs CEO John Hepburn, adding that 20 percent of Mitacs interns successfully turn their innovations into startups. “The success of our country’s entrepreneurs in commercializing ground-breaking innovations not only goes a long way in boosting Canada’s economic future, but also helps put Canada on the map as a research and innovation leader.”

About Mitacs

Mitacs is a not-for-profit organization that fosters growth and innovation in Canada by solving business challenges with research solutions from academic institutions. It is funded by the Government of Canada and the Government of Alberta, along with the Government of British Columbia, Research Manitoba, the Government of New Brunswick, the Government of Newfoundland and Labrador, the Government of Nova Scotia, the Government of Ontario, Innovation PEI, the Government of Quebec, the Government of Saskatchewan and the Government of Yukon.

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