ROBOTICS ADVANCe Laboratory (ST Engineering-NTU Corp Lab)

Director: Prof Wang Dan Wei

The ROBOTICS ADVANCe Laboratory is housed in NTU's School of Electrical and Electronic Engineering (EEE) and focuses on two research areas: advanced robotics and autonomous systems to improve airport operations and disaster rescue efforts.

The laboratory's funding is from the Singapore National Research Foundation's Corporate Laboratory@University Scheme, which encourages research and development collaboration between universities and companies.

The next time you check in your luggage at Singapore's Changi Airport, robotic arms could take it and load it onto a driverless vehicle, which would then transport the bag to the aircraft.

By 2018, one of the airport's terminals is expected to pilot an almost fully automated baggage transfer system, which would cut the manpower required for the laborious process by half.

This innovation is just one of many projects at a S$53 million laboratory jointly managed by Nanyang Technological University (NTU) and the ST Engineering group.

Aside from lightening the loads of baggage handlers, the laboratory will also develop robotic systems to improve the efficiency and safety of aerobridge operations and aircraft tow trucks. Such innovations are especially timely as airports worldwide are expanding their premises. Logistics companies could also use these systems to move large items in their warehouses.

In the pipeline too are small robots that can survey disaster-struck areas quickly and help emergency responders to look for survivors. Statistics show that, in the last decade, there was an average of 360 large-scale natural disasters in the world each year.

The robots would use on-board sensors such laser rangefinders, which measure the distance to an object, to create precise maps of the damaged areas so people can plan safer and more effective rescue missions. They would also be able to enter environments that are unsafe for people and look for signs of life.

Unlike today's robots, which have to be remotely-controlled, these "smart" robots would be autonomous and enable crisis responders to deploy manpower and resources more productively.

The inventions are also expected to be used in healthcare, transport, security and urban development, and help Singapore realise its ambition to be a "Smart Nation" powered by next-generation technology.

In the shorter-term, the laboratory's work will not only provide solutions to Singapore's labour constraints, but also help the country and its neighbours to cut costs and boost their economies. In the airport operations sector, for instance, labour costs currently form up to 70 percent of all operational costs.