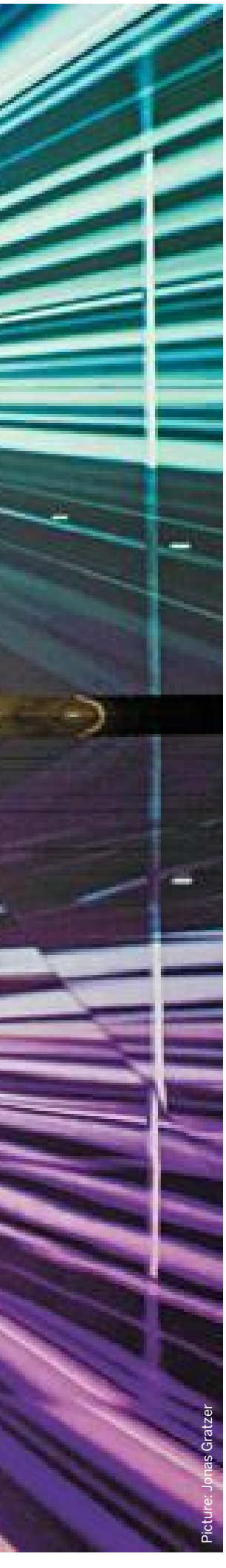

Picture: Jonas Gratzer

Our friends electric

South Korea is an AI pioneer, with robots already boosting the economy, and soon expected to take on a wider role in society, from providing rescue services to caring for the elderly. But the technology has also sparked fears of a dystopian future.

BY **JOHAN AUGUSTIN**

Departing passengers at Incheon International Airport, on the outskirts of the South Korean capital, Seoul, wave goodbye to friends and loved ones, and say hello to the future. "Please touch my face," a GuideBot says to one traveller, in English. The robot, which also speaks Korean, Mandarin and Japanese, can recognise boarding passes that are scanned onto its broad touch-screen visage. "Please follow me."

The robot connects to the airport's central server to find out boarding times and locations of restaurants and shops. If asked, it will accompany a passenger to their gate, gliding over the airport's shiny floor.

Nearby, a CleanBot works without complaint, having taught itself which areas require the most frequent cleaning and how best to navigate between them.

The robots belong to South Korean multinational LG Electronics' CLOi (pronounced "kloh-ee") family. Both are prototypes but could be a more common sight in the near future. About a dozen GuideBots currently glide around the airport at Incheon, while similar facilities in the United States, France and the Middle East have placed orders.

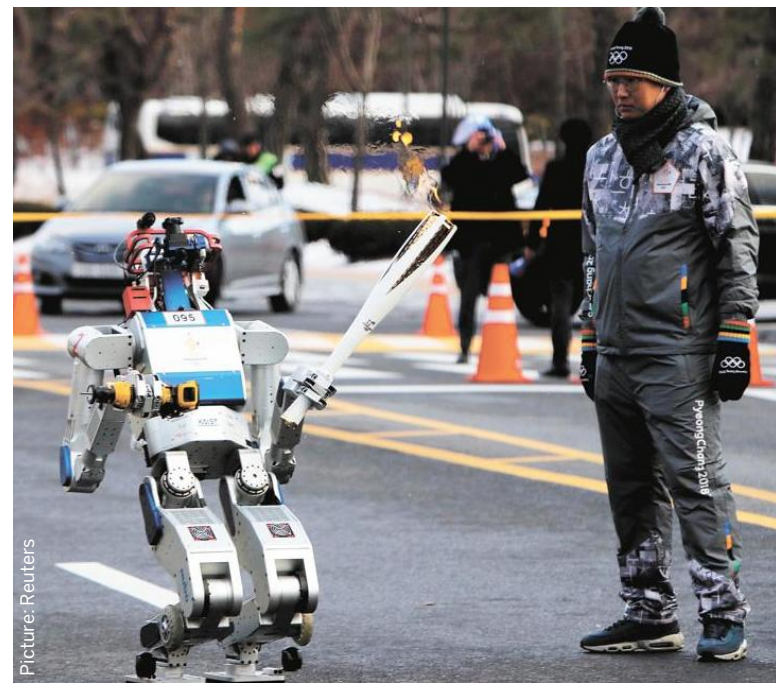
Some 35km east of the airport, closer to the centre of Seoul and near the west bank of the Han river, stands LG Science Park, the company's new research centre. Here, in a futuristic glass building, Choi Hyungjin, LG's director of robot business development and product planning, demonstrates a range of new models, including the ServBot (designed to deliver room service in hotels, and serve food and drinks at airport lounges), the CartBot (equipped with a barcode reader and designed to assist customers who need a robotic hand at supermarkets) and the PorterBot (carries bag at hotels and airports, and aids check-in and check-out, thus reducing queues).

LG plans to release those models next year, but hopes to have its CLOi Home on sale before the end of 2018. Able to distinguish faces and greet family members personally, Home is essentially a command centre that can react to spoken directions, and monitor and control a living space and its smart appliances, such as the air-conditioning and entertainment systems, the oven and fridge, and all manner of labour-saving devices.

"It's within the vacuum-cleaner industry that we have the most experience," Choi says. "The next step is to develop other areas."

Artificial intelligence is expected to play a key role in elderly care in the future. South Korea's population is ageing rapidly: in 2016, and for the first time, there were more people over the age of 65 in the country than under 14, according to government data. Currently, there are more than seven million elderly people in a total population of 51 million, and

Picture: Jonas Gratzer


Picture: Reuters


Picture: Jonas Gratzer

Clockwise from left: an LG robot on display at Incheon International Airport, in Seoul; CLOi Home, LG's home assistant robot; a Hubo robot carries the Olympic torch at the Korea Advanced Institute of Science and Technology (KAIST) in Daejeon, on December 11, 2017; an airport visitor communicates with a robot on display at Incheon International Airport.

Koreans have traditionally relied on their children rather than the state for support in old age.

Such facts and figures excite the more than 600 robot companies that operate in South Korea and employ over 34,000 people. In 2016, the Ministry of Commerce announced a five-year plan in which US$450 million was earmarked for developing robots that can, for instance, gauge the emotions of a patient with dementia or cognitive impairment.

In 2014, nursing homes in the United States and Sweden began using GoCart robots, built by Korean company Yujin Robot, to distribute food to residents. GoCart robots have built-in navigation systems and use cameras and sensors to find their way around.

Although Japan, China, the US and Germany are strong competitors, South Korea – which, estimates the Ministry of Trade, Industry and Energy, will have spent more than US$6 billion by 2022 on artificial intelligence (AI) – possesses the largest per capita share of industrial robots.

According to the Frankfurt-based International Federation of Robotics, which was established in 1987 to promote and support the robotics industry worldwide, the global average within manufacturing is now 74 robots per 100,000 employees, although that figure is growing rapidly. In 2016, South Korea had 631 units per 100,000 employees, with the ratio significantly higher in the electronics and automotive sectors.

That same year, South Korean companies sold more than 41,000 robots at home and abroad, a number eclipsed only by China, whose companies sold more than 65,000 robots. Even so, China is the biggest buyer of South Korean robots, according to statistics published by the Korean Association of Robot Industry, and in 2016 the sector was valued at more than US$4 billion, with exports contributing US$857 million to the South Korean economy.

Talk of machines that have been designed to learn is causing unease in certain circles.

In April, more than 50 researchers from around the world threatened to boycott South Korea's leading technical university, the Korea Advanced Institute of Science and Technology (KAIST), over its collaboration with defence manufacturer Hanwha Systems on a laboratory believed to be working on autonomous weapon systems. More than 100 specialists from 26 countries have already called for a global ban on so-called killer robots.

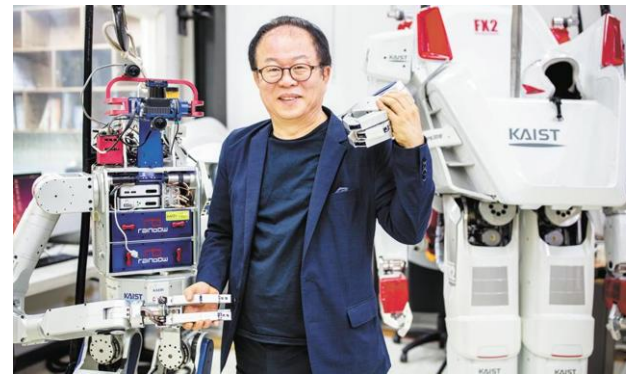
Last year, KAIST opened its Humanoid Robot Research Centre, commonly known as the Hubo Lab, after the institute's celebrated Hubo robot, in the city of Daejeon, 140km south of Seoul. When *Post Magazine* visits the centre, Oh Jun-ho, a professor of mechanical engineering who has long worked on KAIST's robots, insists the institute's goal is not to pursue violent AI applications.

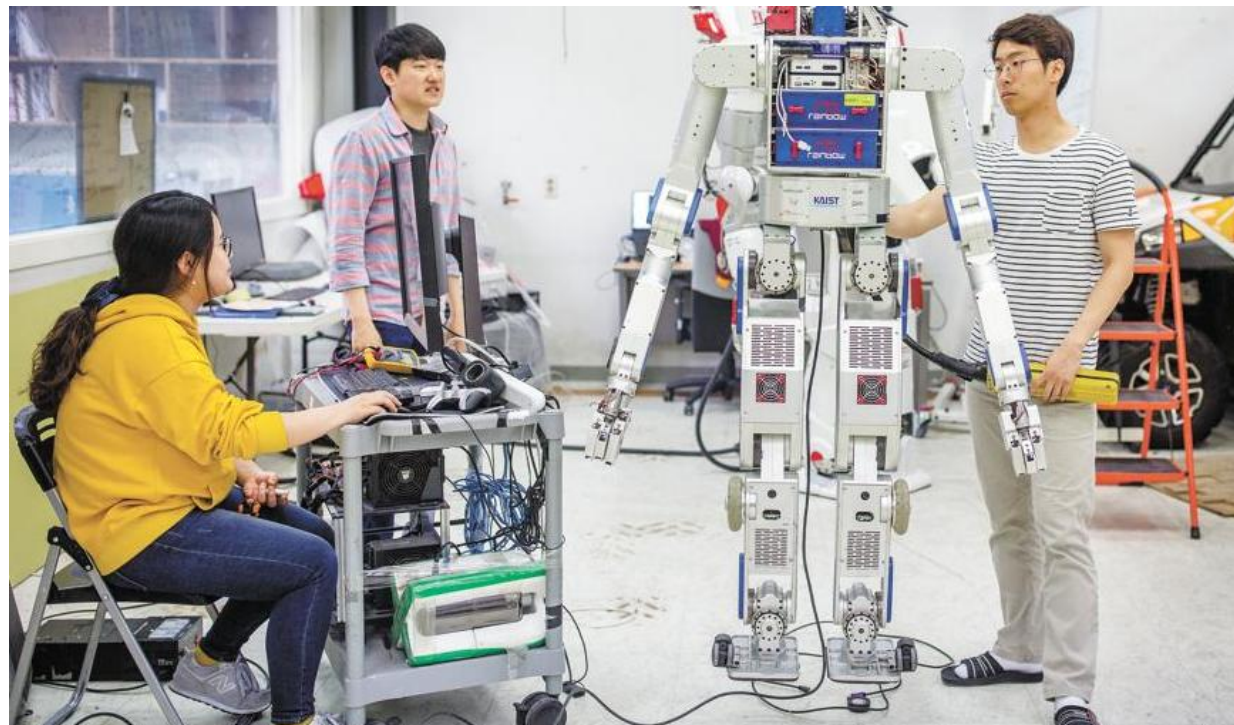
"Those robots can think on their own; we develop AI that don't make their own decisions, but need programming," Oh says. "The goal of our robots is to help people."

The ultimate aim of KAIST with Hubo robots, in fact, is for them to be used in rescue operations. In the run-up to the 2018 Winter Olympic Games, which were held in South Korea, a 1.2-metre-tall Hubo cut and then punched a hole through a wooden wall in Daejeon, to hand the Olympic torch to Oh, who later passed it on to the FX-2, a 2.4-metre-tall robot piloted by a 14-year-old student.

The Olympics was a huge advertisement for South Korea's AI industry, with 85 robots employed in a range of tasks, from cleaning to delivering information to visitors.

The humanoid robots designed at KAIST are "not ready for people's homes yet", says Oh, because they need to be stable and lighter. "We don't want people to get hurt if the robot falls on them," he adds, saying that would be the only way the machines could ever cause harm to humans. ■





Clockwise from top: the CartBot, which is designed to assist supermarket customers, is demonstrated at LG Science Park, in Seoul; Oh Jun-ho, a professor of mechanical engineering at KAIST; the university's futuristic building; students at KAIST work on a robot; Choi Hyungjin, LG's director of robot business development and product planning. Pictures: Jonas Gratzer