DTU Robotics Group Creates Smart Service Robot

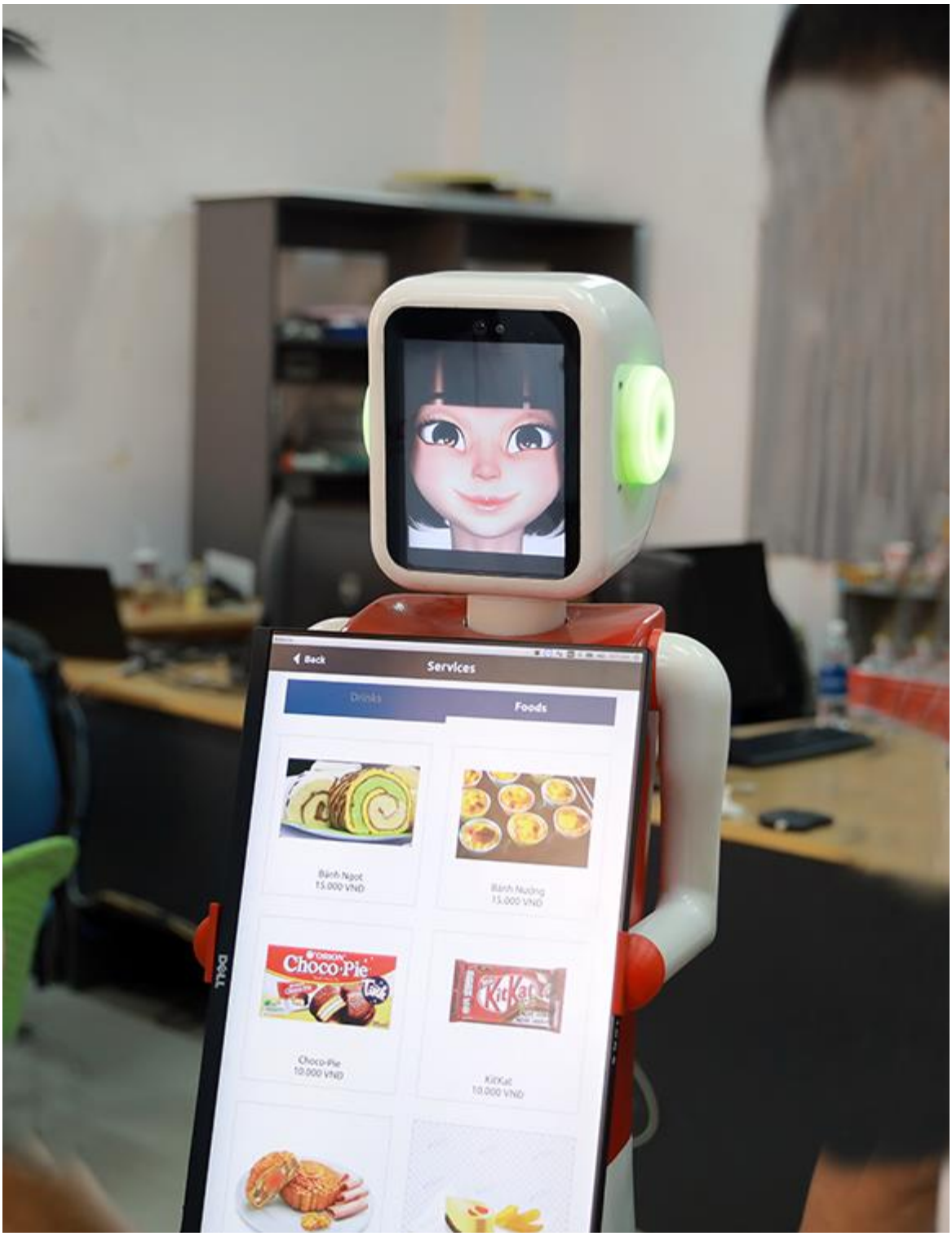
Automation, machine learning and artificial intelligence are now evolving rapidly in Vietnam and robotics have the potential to replace workers in many professions, including education, hospitals, hotels, airports, supermarkets and so on. The University of Nevada, in Las Vegas USA, has much experience in robotic manufacturing technology, which caught the interest of the Laboratory for Corporate Electrical-Engineering Research and the Center for Software Engineering (CSE). They then began experimenting with smart service robots to guide visitors around the university and perform as service staff at restaurants and hotels, using resources currently available at the university.

DTU Robotics Group Creates Smart Service Robot

Traveling to America to learn about robotics technology

Mr. Pham Quyen Anh, with eight years of experience in the field is mentoring a DTU research group with a passion for robotics and has already advised them on previous Vietnam Robotics contests. The DTU team won first prize for the Best Hand-Controlled Robot and Best Automatic Robot in 2013 and third prize and a Style award in 2014.

Mr. Tran Le Thang Dong and Nguyen Duy Hoa have since successfully created several practical robots, used as handheld parking ticket dispensers, a 2-in-1 printer and an automatic washing and drying machine. Nguyen Anh Quoc Huy, Truong Hoang Trung, Tran Khanh Linh, and Nguyen Anh Khai Hoan are all second and third-year Electrical Engineering, Hospitality and Business Administration students who have been concentrating on robotics studies and development.



Smart service robot

Before developing the smart service robot for restaurants and hotels, the group visited the University of Nevada to study robotics. *"This was an excellent opportunity to learn about robotics research and*

production in a developed country," explained Mr. Pham Quyen Anh of the Laboratory for Corporate Electrical-Engineering Research. *"We learned more about the open-architecture Robot Operating System (ROS), which gives us the flexibility to experiment with new ideas and algorithms, like other robotics researchers worldwide. In particular, we learned about positioning and route planning algorithms for robots using special sensors, such as encoders, IMUs, laser scanners and 3D cameras which gave the robots the ability to navigate more precisely. I hope that the Corporate Electrical-Engineering Research Laboratory and CSE smart service robot will be enjoyable, exciting and easy to use."*

User-friendly robot with strikingly attractive design

DTU has campuses located in Quang Trung, Nguyen Van Linh, Phan Thanh and Nguyen Minh Thao. 25 thousand students attend the university every year and many others visitors come for work, conferences or seminars. Difficulties arise when they first arrive at a new campus. The Corporate Electrical-Engineering research laboratory and the CSE are jointly developing a smart service robot to enable new students and Vietnamese or foreign visitors to quickly locate a classroom, meeting or conference room.

The DTU research group

As soon as the first robot was functional, the team started adapting it for use in restaurants and hotels, to welcome customers and lead them to their tables. To do so, it must move flexibly, have eye-catching

design and shape, and be friendly while engaging in advanced interactions to assist the diners appropriately.

The robot's head is equipped with a 10-inch screen image of a face, with expressions of happiness, sadness, anger, nodding in agreement, head-shaking in disagreement and a sleeping state. Its body below contains the motherboard, computer, moving mechanisms and a 24-inch touchscreen. The robot is also equipped with two cameras, an ordinary one, to detect where people are, and a 3D camera to map its working space.

Through the touchscreen, the customer will interact with the robot, view routing information, review the menu and prices, and order drinks and food. The built-in sensors and AI algorithms allow the robot to interact through simple voice control technology, in many different foreign languages.

"In promoting our robot, we plan to provide its functionality to become an additional key employee to assist the real waiters, and I'm excited to be involved in this project." said Nguyen Anh Quoc Huy, a second-year Electrical Engineering student. *"At the same time, we can continue our research and receive strong guidance from our lecturers on how to create a robot that and fully meets customer requirements, using our electrical engineering knowledge. In addition, we are currently preparing to compete in a startup contest to create a robot that can be used practically to improve productivity and product quality without human intervention."*

(Media Center)