

ACHIEVEMENTS

# NTU Collaborates with National Science and Technology Council to Develop AI Robotic Dogs

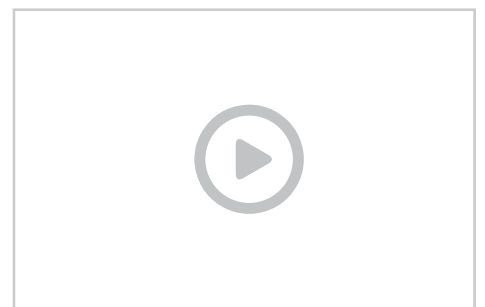
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Left to right: Liu Hao-Yu, Cheng Tzu-Chia (Members of ASR Lab).

Under the leadership of Prof. Chung-Hsien Kuo of the Department of Mechanical Engineering, the Autonomous & Soft Robotics Laboratory (ASR Lab) at National Taiwan University (NTU) has made significant progress in developing AI robotic dogs, with generous funding from the National Science and Technology Council. The ASR Lab members have successfully developed two prototypes: a small-to-medium-sized robot dog named Oliver in February 2024, followed by a working robot dog named Dustin in May 2024.

Oliver and Dustin were conceived and developed on the technological foundation established through the team's earlier work in creating a 160 cm tall bipedal humanoid robot (HuroEvolution AD), for the RoboCup World Cup robot soccer competition. The research and development process for building such sophisticated robots includes mechanical structure design, fabrication, circuit design, control engineering, gait generation, autonomous navigation, and AI algorithms, requiring a highly integrated approach to mechatronic design, system dynamics, control, and software integration.



Cheng Tzu-Chia, Second year of Graduate Institute Of Mechanical Engineering, introduces two AI robotic dogs from ASR Lab.

## Oliver

Oliver, a pet robot dog measuring 54 cm in length and weighing 16 kg, is equipped with motion teaching and AI vision capabilities. It can detect and interact using voice and facial expressions, making it suitable for home interaction, companionship, and security patrol. Oliver is also designed as an open development platform, providing educational tools that inspire students to explore creative applications and programming skills in AI robotic dogs.

## Dustin

Dustin, a working robot dog measuring 93 cm in length and weighing 40 kg, is designed for industrial inspection and item delivery. It can be equipped with various industrial sensors (such as sound, vision, temperature, and gas sensors) and integrates with Line Bot for real-time message reporting. The goal is to introduce Dustin into the service and manufacturing industries at a lower cost, to address labor shortages in such sectors as chemical plants, construction sites, railway maintenance, restaurants, and logistics.

NTU's Department of Mechanical Engineering is committed to addressing Taiwan's severe labor shortage issues, particularly in industries that are closely tied to daily life and have attracted significant public attention. The team is accelerating research and development efforts to provide solutions to such societal concerns. Additionally, the team is actively incorporating AI to enhance the NTU DogBots' ability to adapt to complex environments and terrains, with the aim of bringing this advanced technology to practical application as soon as possible.



Prof. Chung-Hsien Kuo with ASR Lab members.



The NTU DogBot, Dustin.



The NTU DogBot, Oliver.