P3

1 In the lab, I'm working on research about autonomous mobile robots. (TurtleBot to achieve localization, path planning, and navigation)

4 After exchangement, I gain the confidence to study in Japan, since I adapt well to both Japanese and English-speaking environments.

5 Chien Kuo High School is the best boy's high school in Taiwan

P5

Actually, most project I've done in university is related to mechanical design, as you can see in graphs with number 1 to 5. So, number 1 to 3 are car robots designed for the Capstone Projects in my department.

4 and 5 are drone robots designed for TDK Competition held in 2021.

(Besides, the graphs without numbers are the robots designed for high school students at C.K. Robotics, where I served as a team mentor.)

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Billiard car:

Project conducted in fall '20, 1st Capstone Project in ME department

Propeller-Powered vehicles:

The project was conducted in spring '21, 2nd Capstone Project in ME department, Mechanical design leader in the group (designed the whole structure of the robot)

UAV:

The project was conducted in Jul. 2021 - Dec. 2021, 2021 Taiwan TDK Competition, UAV group, Championship, won 200,000 ntd (about 911,412yen) knew the application about ROS for the first time

FRC:

Guided more than 30 students to fabricate and optimize the robot that performed assigned missions. Also, I gained more practical experience in metal machining.

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In here, we will have a demo of Propeller-Powered Vehicles that successfully achieve the given task in the capstone course.

P6

The project was conducted last summer.

It's a self-made project in Intelligent Robot Lab, without using any funding from the lab.

Using the mapping algorithm Hector SLAM to extract an internal map

Through this project, I learned how to use Raspberry Pi, ROS, Linux

8
Robot is the intersection of my expertise mentioned before
9
With the aid of knowledge I learned in University, such as Control Theory, Kinematics, Mechanics, and Programming, I'll be able to perform research in the robotics field. In Robotics, I'm interested in Quadruped Robots, Autonomous Driving, Humanoid, Drone (UAV)
In addition, I think Autonomous driving is closest to our lives. And since I have experience in indoor Autonomous Mobile robots, I can extend the knowledge I learned before to perform research in autonomous driving if I have the chance to research in the related field.

10~13
For my research plan, I want to integrate Robotics with AI. In here, the AI refers to Reinforcement learning.
The reason behind this is because of the inspiration from one previous research about Quadruped by Massachusetts Institute of Technology.
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Video:
In the video, we can see that the human-designed controller fell down on the boundary between gravel and pavement, while the learned one successfully overcome it and prevent the robot from falling.
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Therefore, in my research plan, I would like to use a learning-based method. So that robots will be able to deal with different conditions outside of the lab. In conclusion, the technology can save time coding or tuning parameters for different environments. Moreover, it would be scalable to other applications on different kinds of robots.