Project Proposal 3

Object Detection for Simulated Drones

Industry Partner: Robotics Masters Limited

Location of Partner: North Sydney

URL for Partner: https://roboticsmasters.co

Contact Person:

Name: Cian Byrne Email: cian@roboticsmasters.co Phone: 0466 896 053

Allow taken by multi groups: NO

Specific requirements/skills:

Interest in robotics and autonomous vehicles. Skills in Programming (C++/C, Python preferred), Linux, Unity and interest in TensorFlow/Keras, OpenCV.

Project Outline:

Autonomous Vehicle Tech involves many different aspects of Software, Computer Vision, AI, Hardware, Electrical, VR, AR, IoT, and embedded computing.

If you are interested in being prepared for industry jobs the best place to learn the methods is to get involved and start experimenting with the technologies by seeking out where the most community support and development is happening.

The goal of this project is for students to walk away with a serious understanding of Artificial Intelligence (AI) technologies associated with autonomous vehicles, so they can develop and apply them to real-world roles post university.

For this project we will be asking students to implement in a simulated world algorithms to detect different objects.

The Project – Implement Object Detection

In the future there will be millions of drones flying around the globe. Like planes, these drones need a way to avoid collisions in the sky.

Students will be looking at existing techniques and creating new software solutions to detect a number of pre-defined types of objects using AI (Tensorflow) and Computer Vision (CV). Teams will look at different technologies and come up with a solution that is reliable and efficient. This will involve data collection and cleaning.

Teams will be using the Gazebo simulator for PX4 to test their algorithms and solutions.

Students will work directly with the Robotics Masters Team and be able to gain valuable industry knowledge.

Meetings will take place over Zoom, twice a week between clients and students. All other communication will be via email.

Ideally 1 team of 3 or 4 students will be involved.

Reference Material/Links

PX4 Simulator List: https://dev.px4.io/v1.9.0/en/simulation/

Gazebo: https://dev.px4.io/v1.9.0/en/simulation/gazebo.html

Tensorflow Classification: https://www.tensorflow.org/tutorials/keras/classification