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ENGINEERING

MONASH University

Faculty of Engineering
Summer Research Program 2022-2023

Project Title: Robotic Grasping with a Soft Gripper

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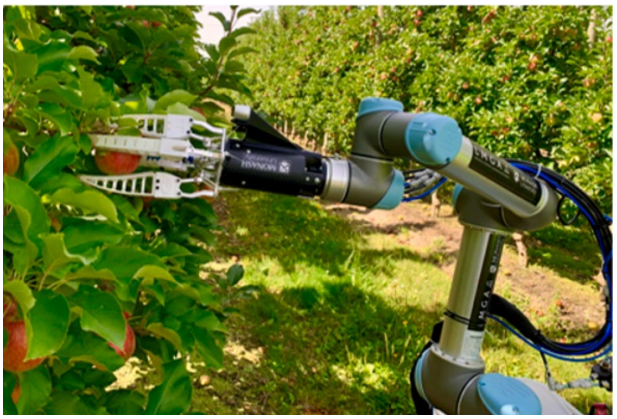
Objective

Robotic grasping is often carried out with rigid grippers, suitable for structured environments. Soft grippers, on the other hand, allow contact with the environment without getting damaged and enables a more human-like grasping. This project aims to employ machine learning techniques to learn how to pick up objects such as fruits and vegetables, as well as household objects.



Project Details

The hardware that will be used for this project consists of a UR5 robotic manipulator with a 3-finger soft gripper developed by Dr Chen's lab. A variety of sensors will be utilized to facilitate the robotic grasping including an RGB-D camera attached to the robot's wrist, a Force/torque sensor also attached to the robot's wrist, and potentially external cameras.

The project would consist of 3 stages:

1) Collecting trial and error data of robotic grasping of daily objects
2) Training a deep neural network that takes in the sensor data and outputs the grasp pose as output.
3) Evaluating the performance of the method by grasping various objects from a table surface.

Prerequisites

- Strong programming skills in Python
- Interest in publishing the results of research in a scientific journal
- Experience with training deep neural networks is a plus
- Hands-on experience with robots is a plus