SUPERVISOR/S: Benjamin McGuinness and Shen Hin Lim

PROJECT TITLE: Adoption of rock melon harvester to field trials

FIELD: Mechatronics, Mechanical, Vision

DIVISION/SCHOOL: HECS - School of Engineering

PROJECT LOCATION: Hamilton

PROJECT ABSTRACT:
Cutting-edge robotics in horticulture are in high demand, due to high labour shortage, the attempt to meet Zero Hunger by 2030 and the goal to double NZ produce export by 2025.
Cantaloupe, also known as rockmelon, is also one of the high-value fruits that is labour intensive in harvesting. From a capstone project last year, a system has been developed to identify and harvest a "look-alike" cantaloupe. The testing is successful in the lab environment.
Following a grower’s consultation, we would need to proceed with three directions:
1. Data collection at the farm using an RGBD camera. This is to capture the state of the fruit and farm while considering the surrounding environment for the vision system to operate. This will require the development of an experimental rig such that data capture is consistent for vision system integration.
2. Evaluation of the current system in the field, particularly the end effector. While the “look-alike” cantaloupe closely replicated the important features, it is still important to test the system with the real fruit (only available in the summer season).
3. Alternative cutting mechanism of the end effector. From the grower’s feedback, new breeds of cantaloupes will require an action that reproduces manual cutting motion by a human picker. This will require a new concept of the end-effector.
The summer research project will focus on the first two directions while starting the third direction. This project will lead to a Capstone project in 2022.

STUDENT SKILLS:
- concept design and knows how to use Solidworks
- a basic background to vision/image processing

PROJECT TASKS:
- Data collection at the farm
- Testing an existing system
- Start a new design concept

EXPECTED OUTCOMES:
- Student’s Research Poster (as per clause 6 of the Scholarship regulations)
- A testing rig for camera data collection in the farm that can be utilised for new system.
- Data collection of the end effector on an existing end-effector