AGROBOT

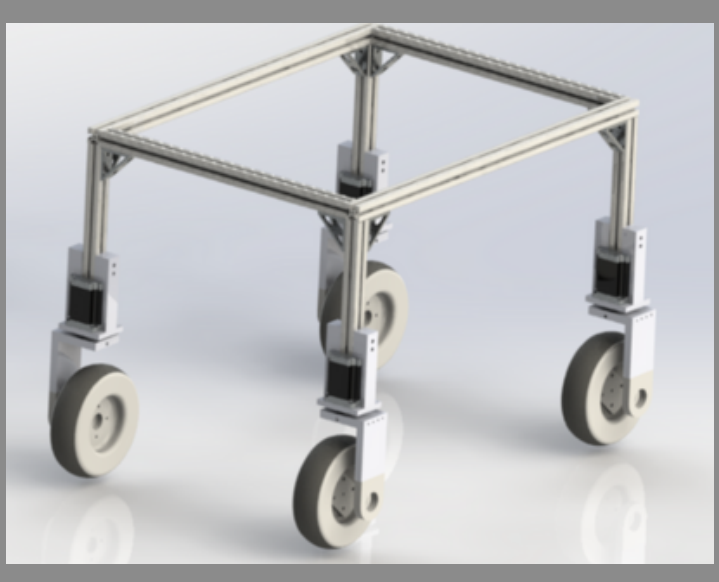
UBC AgroBot is a student engineering design team with a passion to make agriculture more efficient and sustainable. We hope to accelerate automated precision farming and develop future-proof agricultural technologies.

AGROPONICS

The AgroPonics team is working to design and implement and autonomous hydroponics systems on the UBC campus. The team's goal is to make energy and cost-efficient systems that can one day be implemented on a larger scale to grow food. Using sensors and control systems, the aim to design a hydroponics system that is as self-sufficient as possible.

AGROBOT

Our AgroBot project is developing an autonomous robot capable of traversing crop rows and performing targeted weed extermination, fertilization and data collection. It incorporates interdisciplinary design spanning the areas of agricultural science, mechanical engineering, electrical engineering and software development.

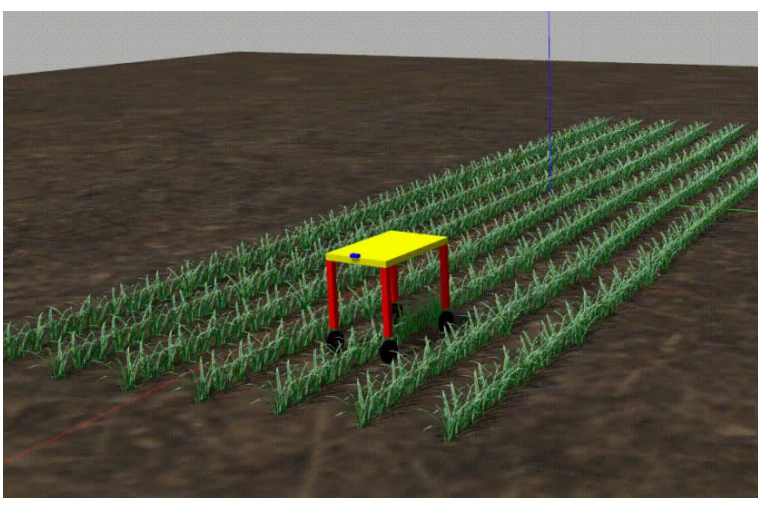


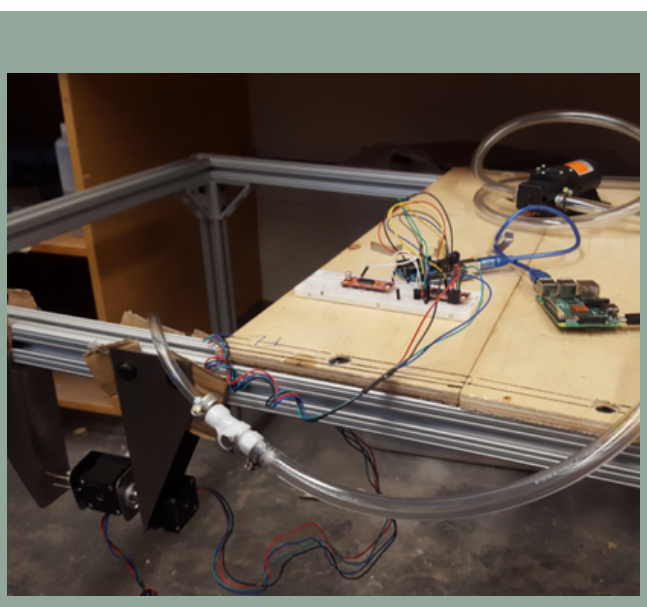
CHASSIS/ POWERTRAIN

The Chassis/Power-Train subteam is building and modifying the design of the chassis to better accommodate movement through crop rows. The chassis components are designed in SolidWorks such as the frames and wheel swerve. The team is responsible for power supply and distribution to all on-board components as well as drivetrain design and operation. The drivetrain system incorporates ROS to obtain self-drive data from the navigation sub-system and uses it to maneuver and orient the chassis.

NAVIGATION

The Navigation subteam develops the self-driving software for the Agrobot to autonomously navigate crop rows using on-board cameras. The team's goal is to design a fully autonomous algorithm that will incorporate the inputs of various on-board sensors to allow stable driving and motion planning. This software implements real-time computer vision techniques to process a video feed, extracts this data into a control algorithm, and determines the speed and steering controls be sent to the drivetrain sub-system.



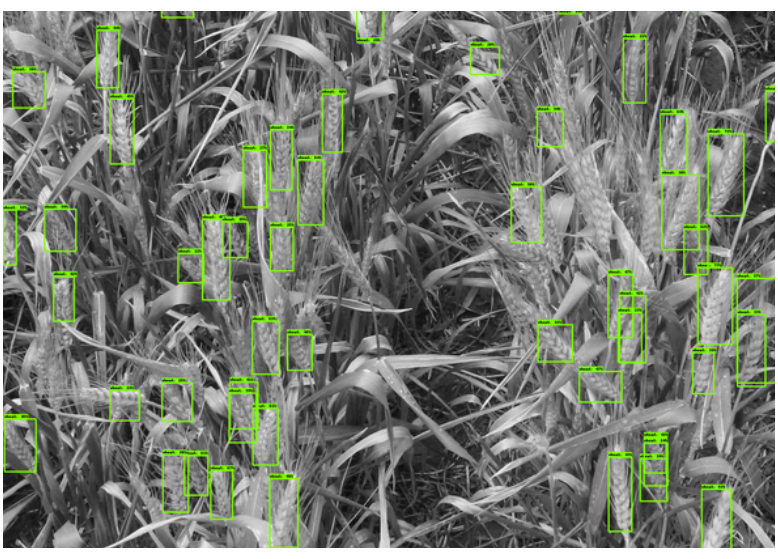


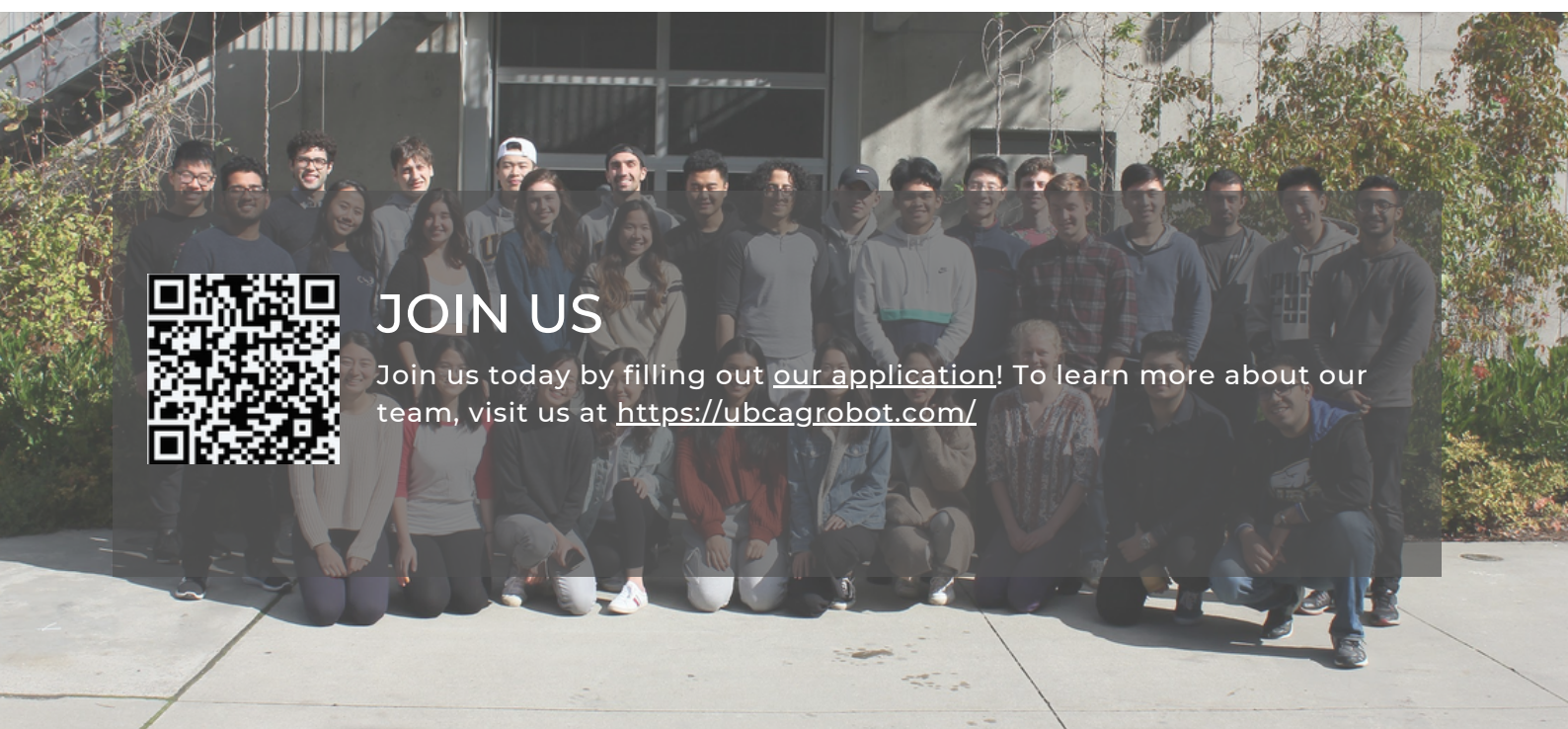
EXTERMINATION

The Extermination subteam is building the robotics system to mechanically or chemically exterminate weeds in crop rows. This incorporates robotics development including mechanical and embedded systems design. The team's goal is to receive data obtained from the image recognition sub-system through ROS, target the detected weed, and execute the appropriate method of extermination.

IMAGE RECOGNITION

The Image Recognition subteam designs algorithms to allow AgroBot to recognize crops & weeds, analyze crop health, and calculate crop coordinates in the farm field. This information allows AgroBot to gain awareness of crop conditions and weed distribution in the field. The team focuses on researching image-based datasets and leveraging them to develop machine learning and deep learning models. The aim is to build robust and lightweight models to help make the AgroBot more perceptive of its environment.





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