Hive Monitoring: Final Presentation

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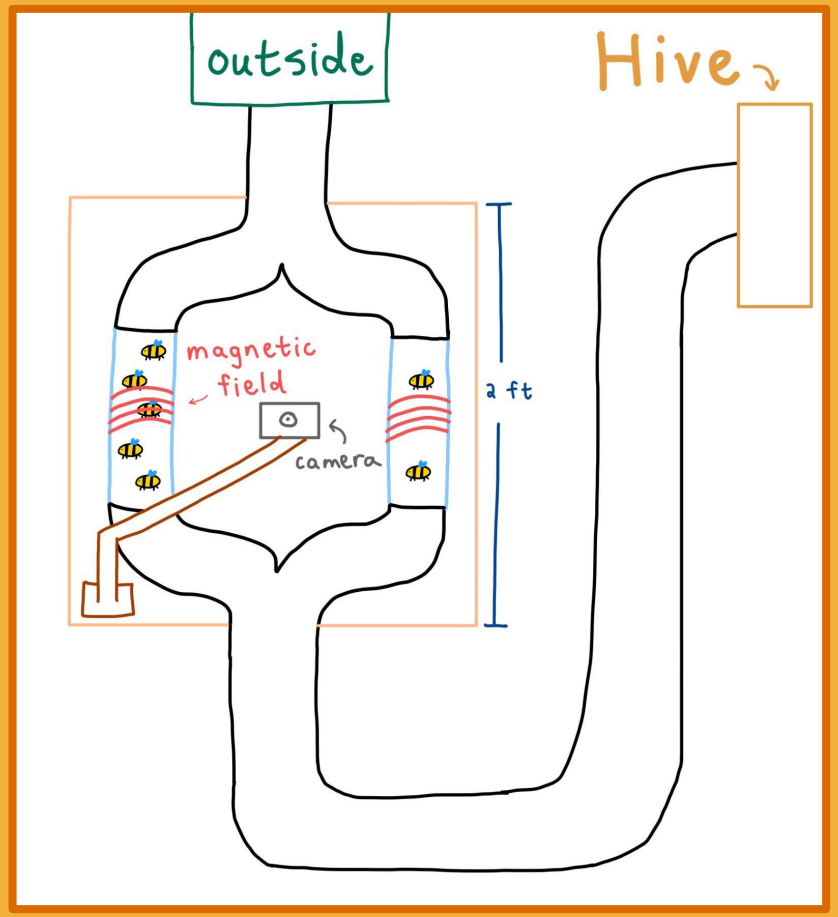
Objective

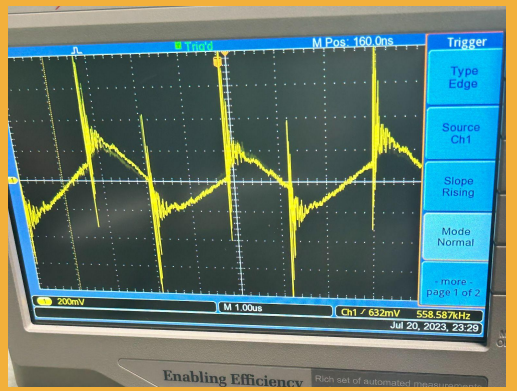
- Determine if bees are impacted by electromagnetic radio frequency waves
  - Potential connection to increasing bee mortality
- Use machine learning to try to detect patterns in bee behavior in response to the magnetic fields


outside
Hive
magnetic field
camera
2 ft


SNAPPER

Circuits

- Built and programmed a DC circuit and attached it to the bee apparatus, collected data from the raspberry pi
- Wrote program for an AC current, soldered the wires, resistors and capacitors, and wrapped the coil around the glass tube, and attached it to the circuit board
- Collected data on the AC circuit

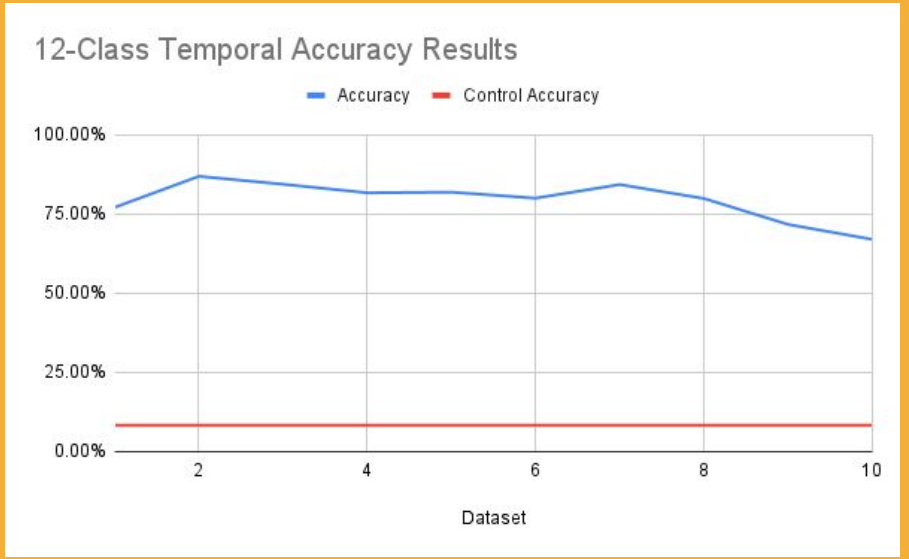


Machine Learning Software

- Gave videos to a neural network to see if the AI can detect patterns in the behavior of the bees due to the magnetic fields
- Debugged several issues with the existing software

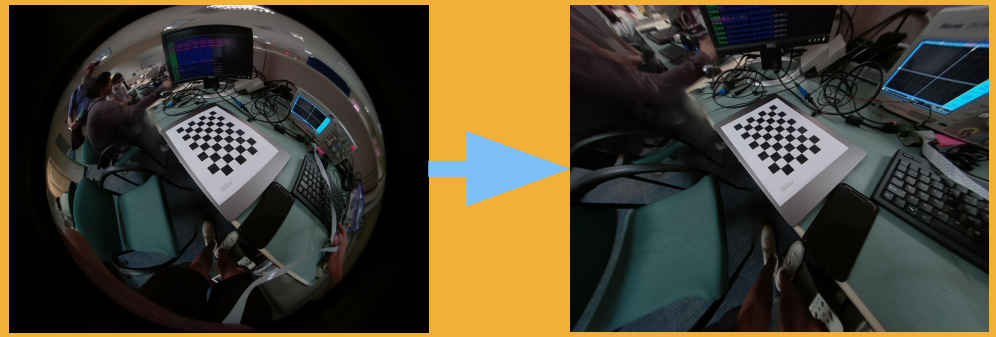
Machine Learning Results

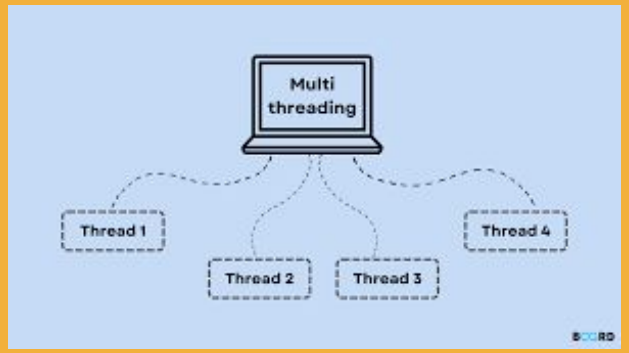
- Generated expected accuracies for control data
- Generated high accuracies from data due to strong temporal correlation of bees daily routine



Camera (setup)

Camera (software)





Next Steps

- Randomize timing of classes when collecting data in order to avoid temporal correlation
- Run additional experiments with different fields in different tubes
- Using hive video for future experiments (counting bees to determine health)