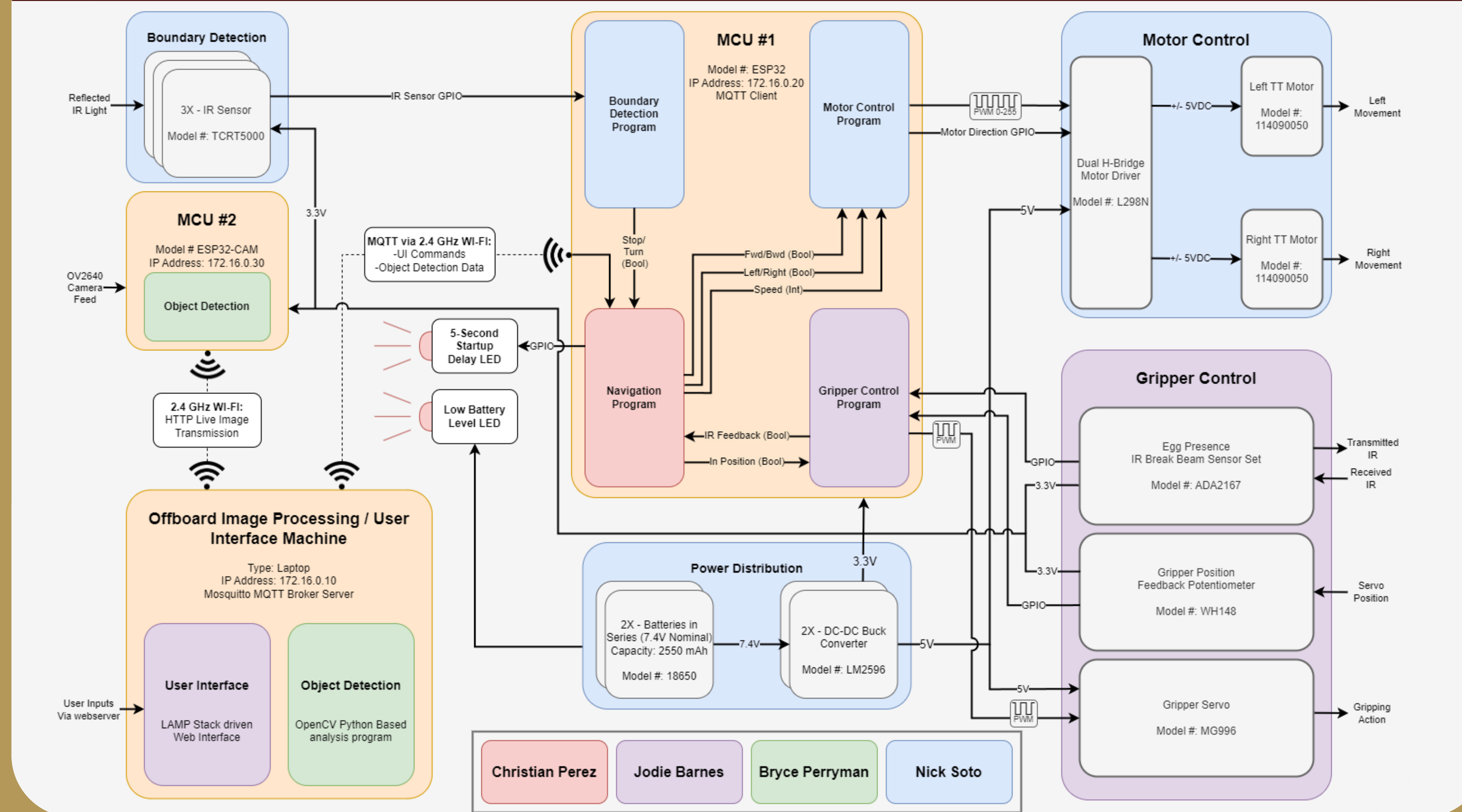




Project Overview

Building an autonomous robot that utilizes a machine learning model to identify and collect colored eggs from a playing field

Top Level Diagram



Team

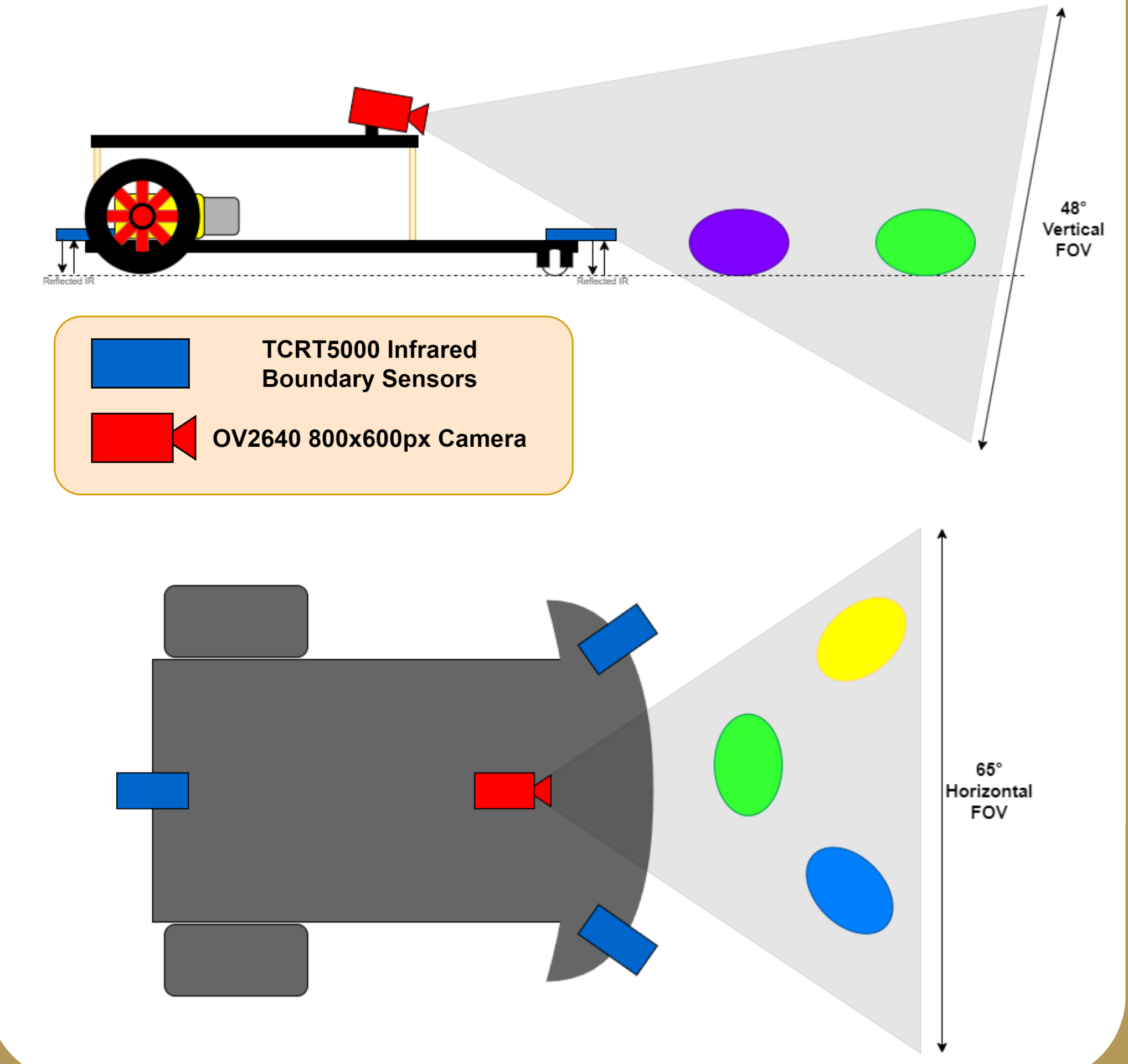


- | | | | |
|---|--|-----------------------------------|---------------------------------|
| Nick
-Boundary Detection
-Power System
-Motor Drive | Jodie
- Gripper
-User Interface | Bryce
-Object Detection | Christian
-Navigation |
|---|--|-----------------------------------|---------------------------------|

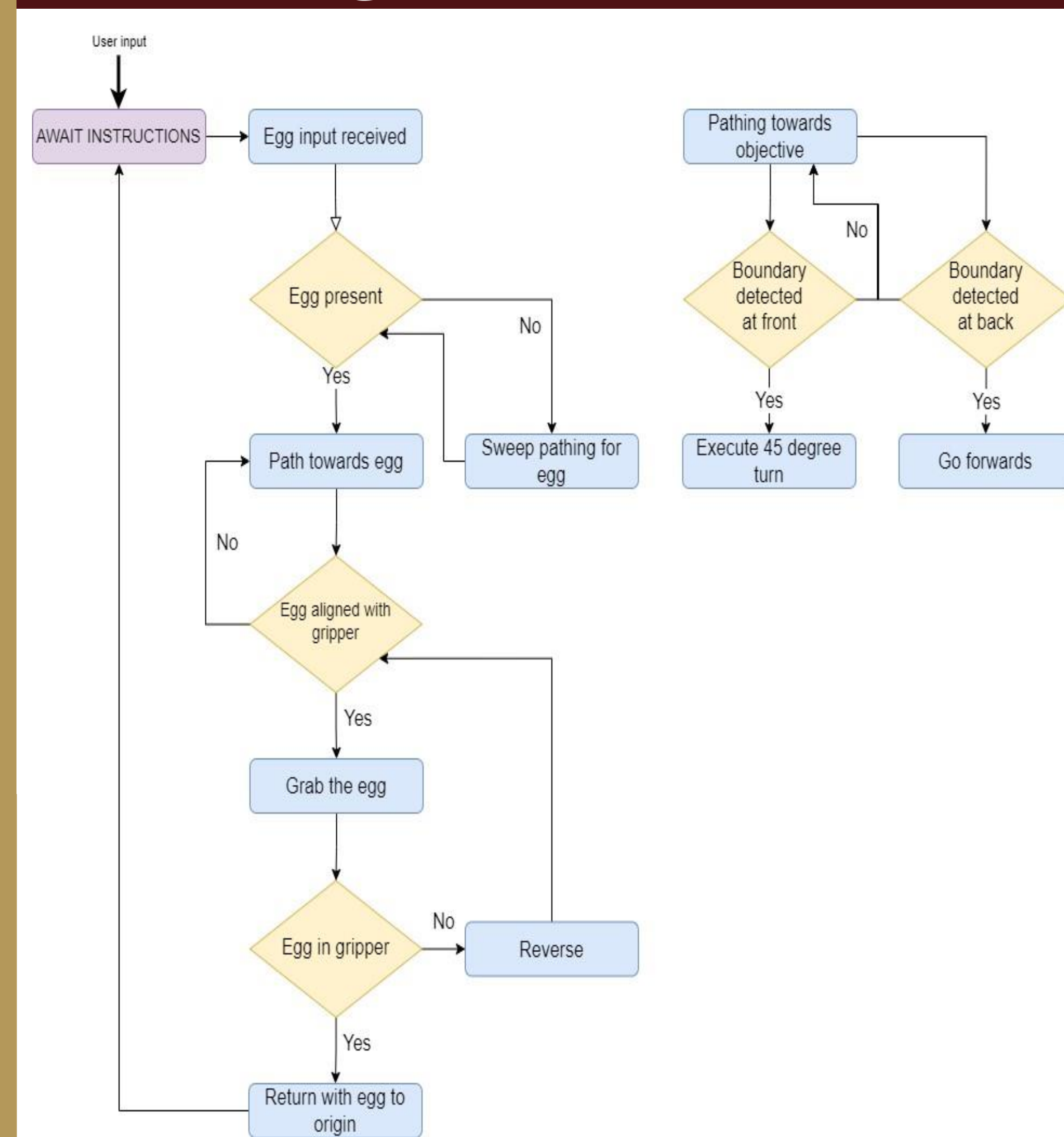
Design 1 Requirements

- Traverse the field, including crossing all foam tiles, without going out of bounds
- Demonstrate the ability to identify the correct egg and its color using the object detection system
- Demonstrate the gripper grabbing an egg without breaking the egg
- Full power budget with component current draws and estimate run time
- Maintain \$40 budget not including provided car kit nor gripper. Current spending at \$26.85 of \$40

Input Device Layout



Navigation Flowchart



Gripper

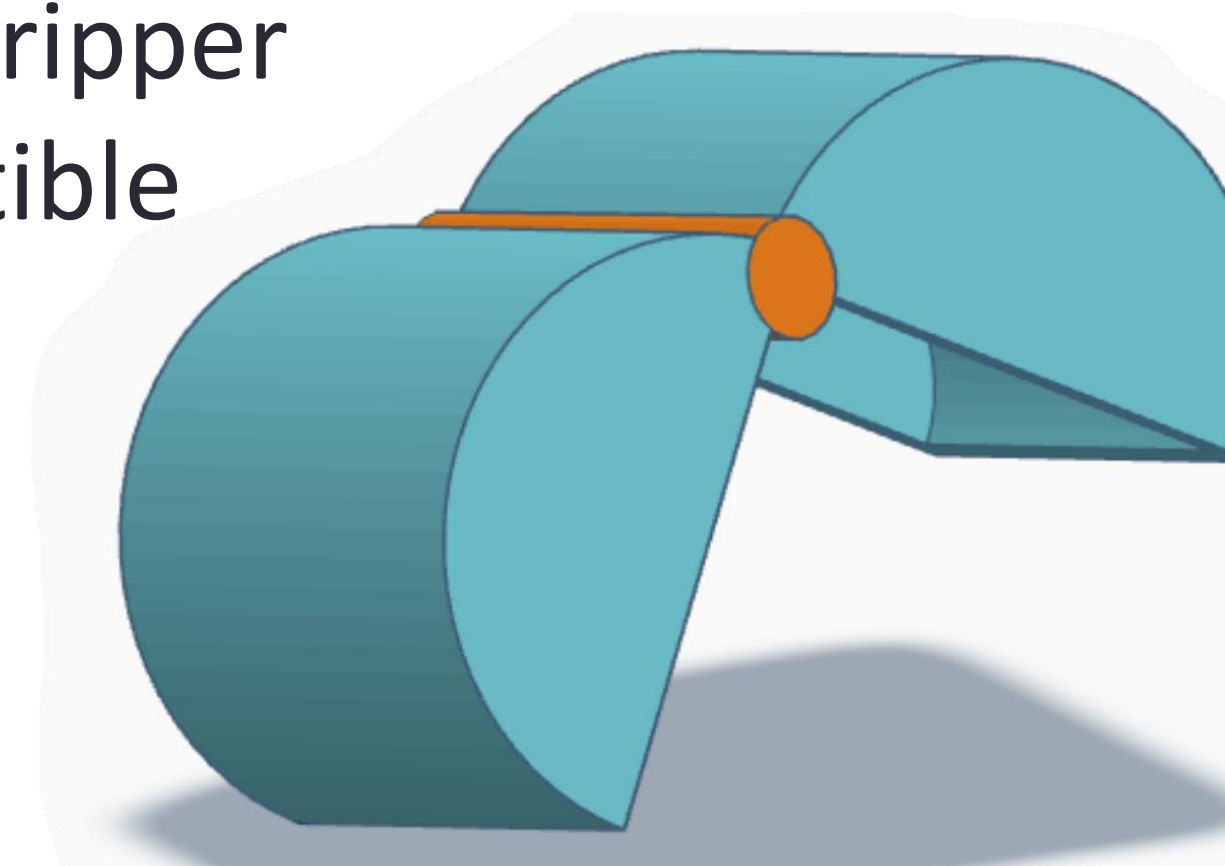
Provided Gripper
Functional with flaws:

- Too heavy
- Slippery
- Incompatible with desired sensor placement



New Gripper Design

- 3D print new base plate
- 3D print new gripper design compatible with sensor placement



Power Consumption

Component	Consumption (mA)
MCU #1	121.5
MCU #2	180.5
Boundary IR	32.4
TT Motors	651
Gripper	100
Total:	1085
Run time (80% Discharge):	182 minutes

Acknowledgements

Sponsor: Jeff Stevens
Faculty Advisor: Liam Quinn
D2 Mentor: E2.03 - Robo Reapers

Design 2 Plan

- Implement user interface to relay color of egg to fetch and tie all subsystems together
- Fetch an egg from a random, unknown position without egg breaking
- Fetch all requested colored eggs from field while avoiding eggs of different colors