

# E1.07 - Robo-Fetch II

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## Meet The Team



Oscar Ramirez, Rouie David, Noel G. Alvarez, D'Angelo Palomo

## Project Overview

- Small autonomous robot
- Moves around a predetermined region to locate and retrieve specified eggs
- Driven by TT motors

## D2 Plan

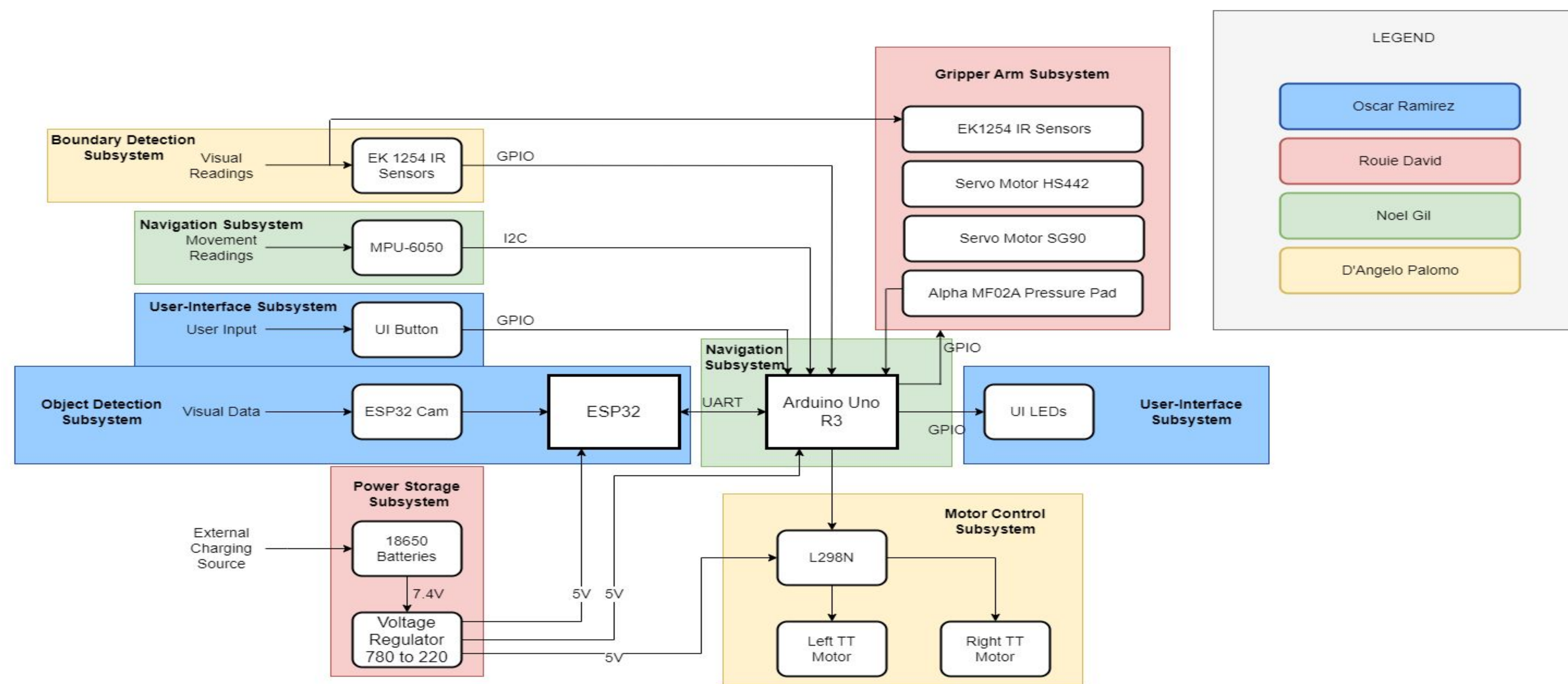
- Improve TT motor accuracy
- Integrate all subsystems into the robot
- Testing full cycle of egg retrieval
- Implement the ability to ignore certain eggs, such as different colored eggs not selected by the user

## Project Requirements

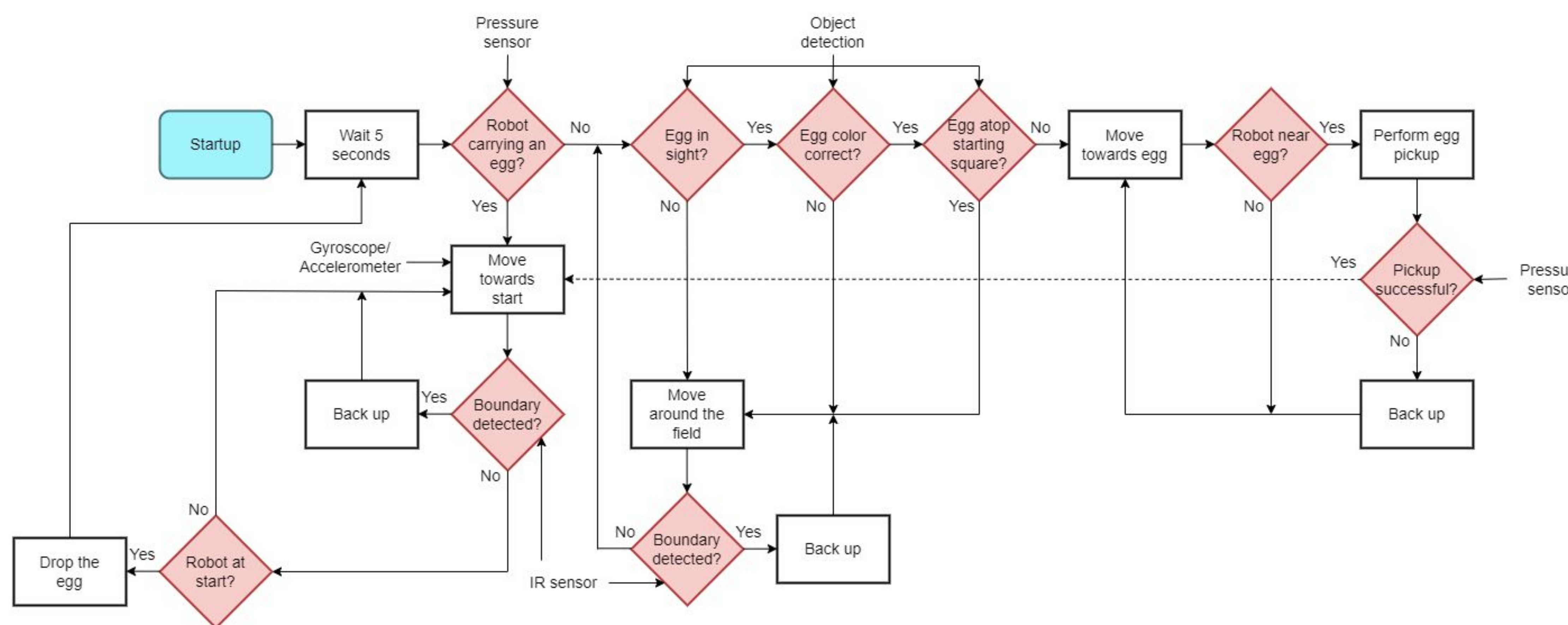
- Robot must be able to traverse the field without crossing the outer boundary
- Robot must be able to differentiate between different colored eggs and prioritize user selected colors
- Robot must be able to grasp and hold an egg using a gripper without breaking the egg
- Robot must wait for 5 seconds after being turned on and after dropping off an egg
- Robot must drop off retrieved eggs at the starting location, denoted by a red square
- Design must not exceed 20cm x 20cm x 20cm predeployment
- Must not exceed a \$30 budget, excluding sponsor provided parts such as the honyond 2wd smart kit and HS442 servo motor
- Robot must not be harmful to others or environment

Egg	Criteria
White Chicken Egg	A store bought chicken egg that is 50-70 mm in length and 30-50 mm in width.
Plastic Egg (Various Colors)	A store bought hollow egg that is monochrome, 50-70 mm in length and 30-50 mm in width.

## Functional Block Diagram



## Navigation Flowchart



## Components List

Component Name	Description	Component Name	Description
Arduino Uno	main microcontroller which drives the robot	TT Motors	DC motors used for locomotion
ESP 32	microcontroller used to drive the camera	EK 1254	IR sensors used to detect the field boundary
ESP32 Cam	camera used for object and color detection	HS442	servo motor in charge of picking up eggs
18650 Batteries	power supply utilized to power the robot	SG90	servo motor used to correct gripper position
Voltage Regulator	regulator used to limit voltage	Alpha MF02A	pressure sensor used to signal egg retrieval
L298N	motor driver board used for TT motors	MPU-6050	gyro/accelerometer used to track position

## Estimated Power Drawn

Components	Expected Current Draw	
	Active	Idle
Arduino Uno R3	40mA	40mA
ESP32-Cam	320mA	20mA
MPU-6050	40mA	70µA
EK1254 IR Sensor (4x)	20mA	20mA
HS422 motor	180mA (no load)	9mA
SG90 motor(2x)	100mA (no load)	5mA
TT Motor (2x)	150mA (no load)	10mA
Max Current Draw	1160mA	104mA
Max Power Consumed	8584mW	769.6mW

## Acknowledgements

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