

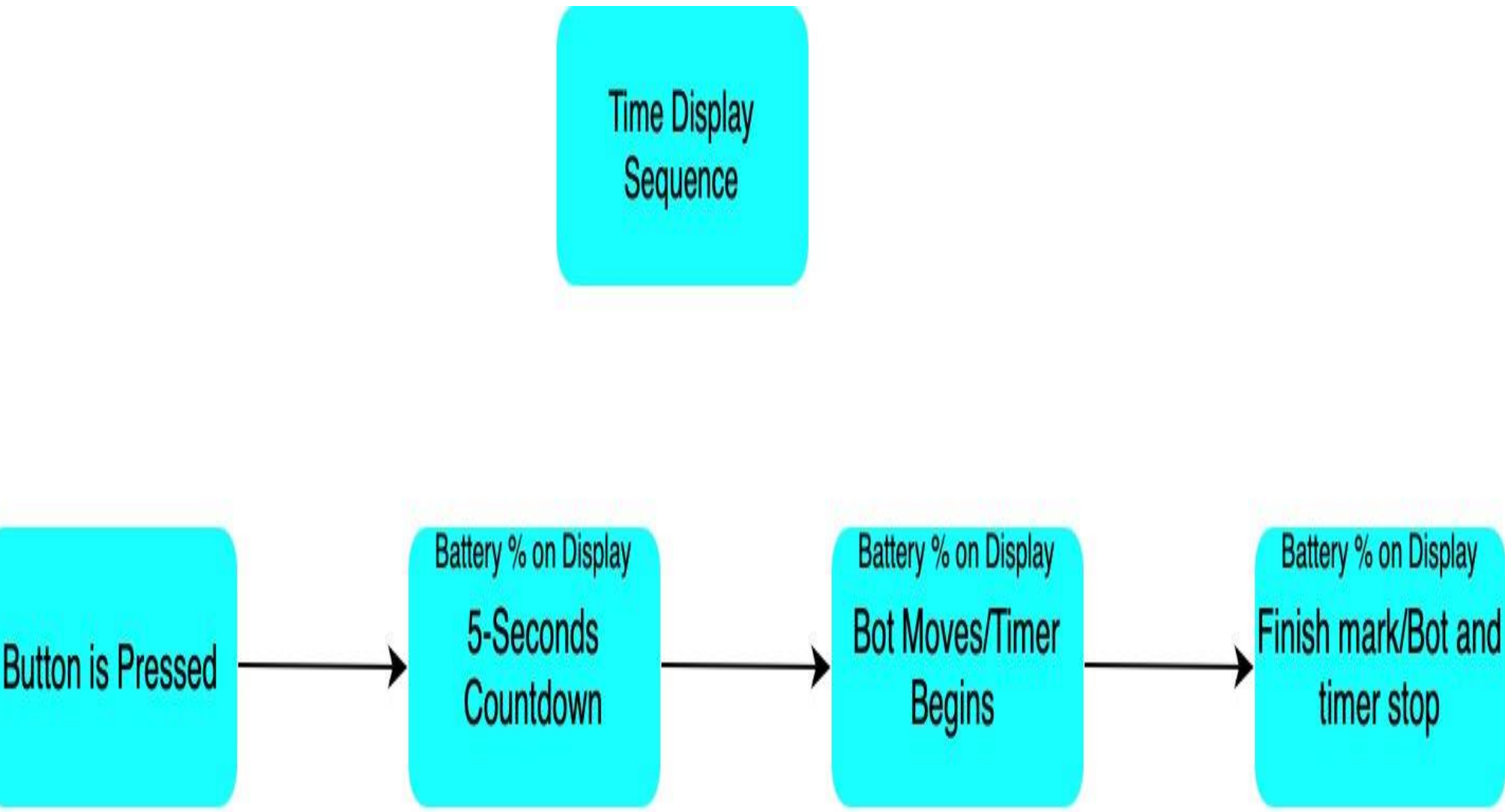
Overview

Autonomous battery-powered robot designed to follow a predetermined course in under 2 minutes

Requirements

- Autonomous
- 15x15x15 cm
- Budget of \$125
- 600g max
- Track navigation under 2 minutes
- 5 seconds countdown/ elapsed timed
- 2 wheel-drive one or more free wheel

Time Display



Cost & Budget

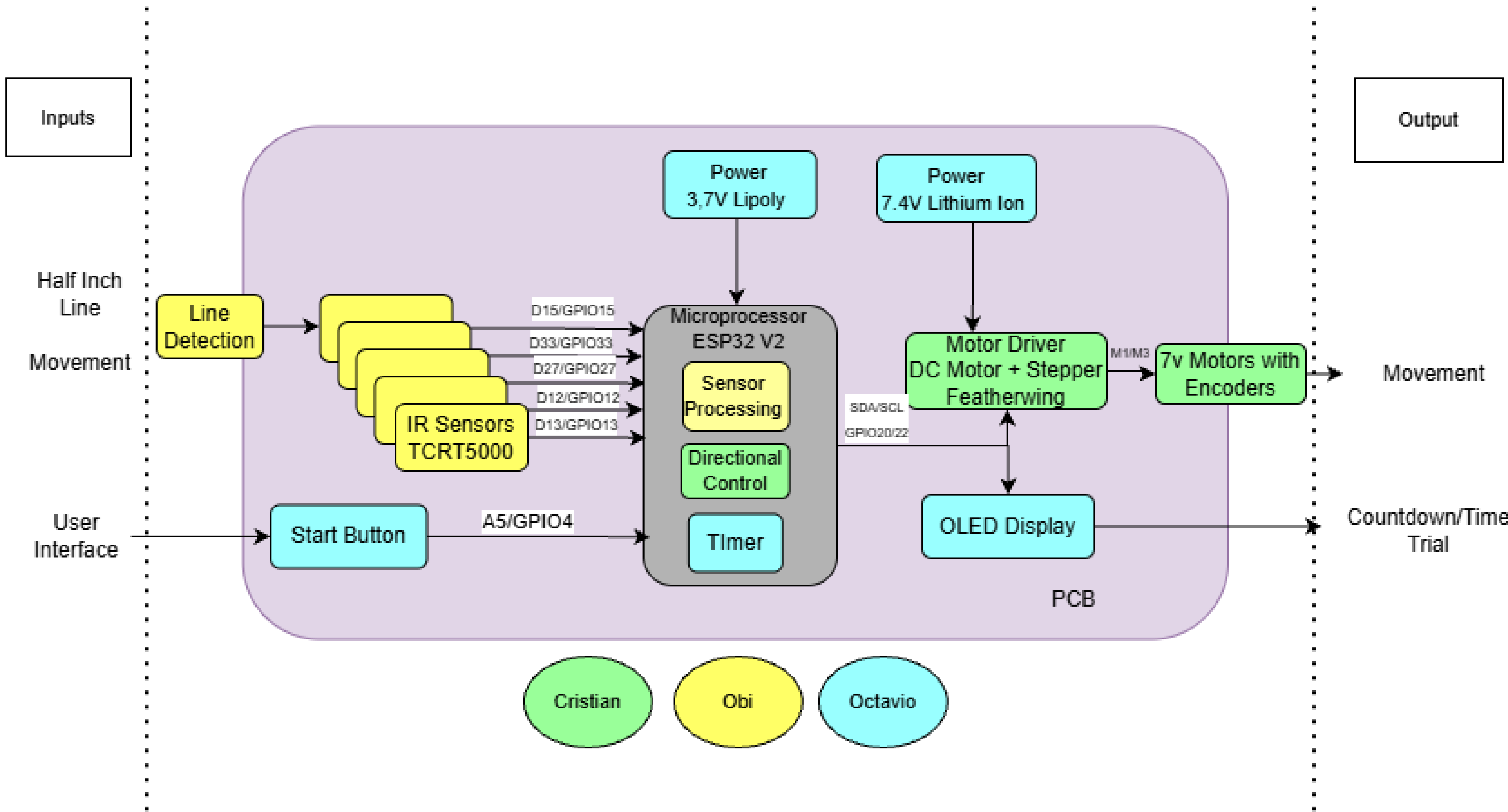
Component	Price	Quantity	Total
ESP32.V2	19.95	1	19.95
DC Stepper + Motor Driver Featherwing	19.95	1	19.95
3.7 Lithium Ion	10	2	20
3.7 Lithium Polymer	6.95	1	6.95
7.4V DC Motors	13.5	2	27
TCRT5000(Sensors)	0.978	5	4.39
OLED Display	17.5	1	17.5
Button	0.1	1	0.1
Total			115.84

E2.05 - Speedy Liners

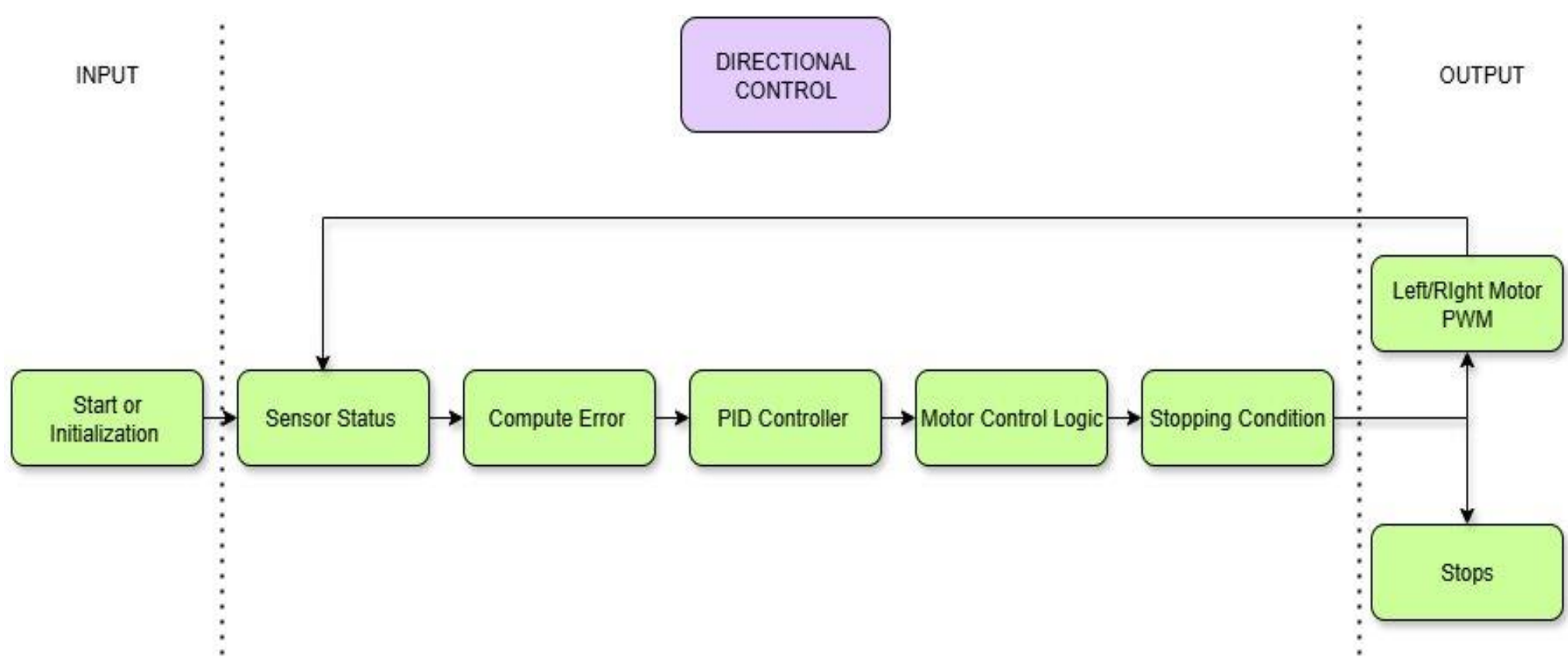
Cristian Chavez Cruz, Octavio Chavez, Obi Isolokwu

Sponsor & Advisor: Jeff Stevens

Overall Block Diagram



Motor Driver Logic



Direcitional Control

Kp	35
Base speed	125
Max speed	255

Trial	Time	Results
1	16:23s	Pass
2	17:02s	Pass
3	4:00s	Fail
4	16:29s	Pass
5	5:00s	Fail
6	16:42s	Pass
7	16:35s	Pass
9	16:10s	Pass
10	18:00s	Pass
11	17:27s	Pass

Test 1 results: PASS

Updates:

- Directional control logic

Procedure:

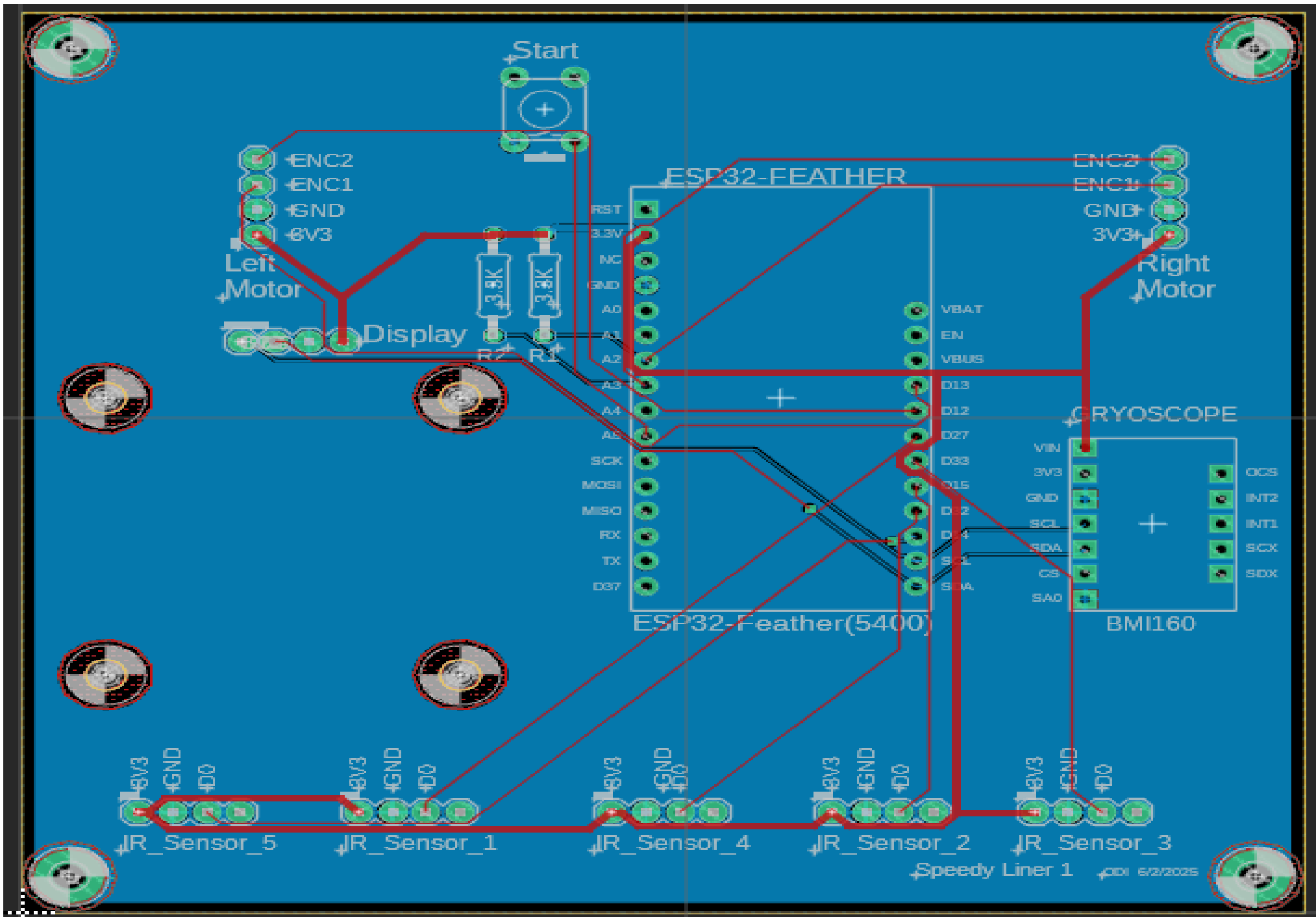
- Tune Base speed to obtain consistent completion
- Set on starting zone to run through the course
- Document time, and completion status
- Adjust base speed if failing more than 2 times out of 3

Results:

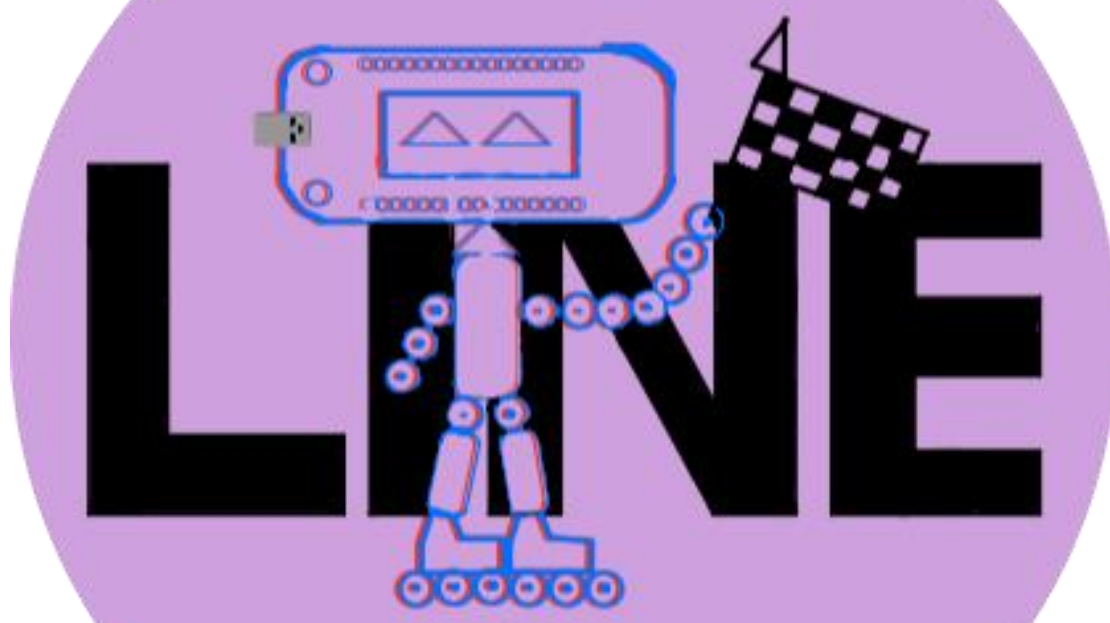
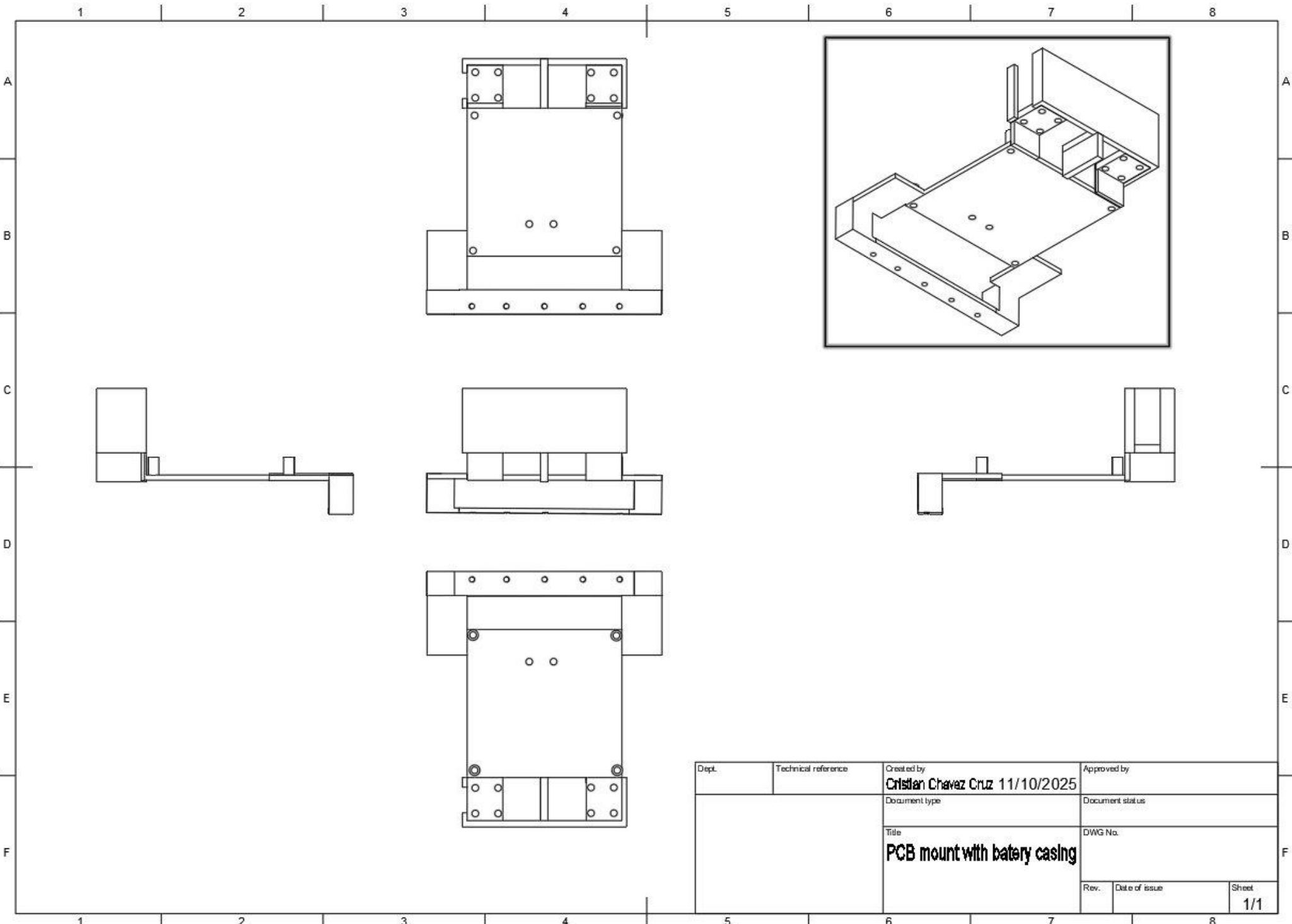
- Bot successfully finished the course 9/11 trials. Max completion time 18:00s and min completion time 16:10s

Sensors weight values:
1:-2 2:-1 3:0 4:1 5:2

PCB Schematic



Chassis Drawing



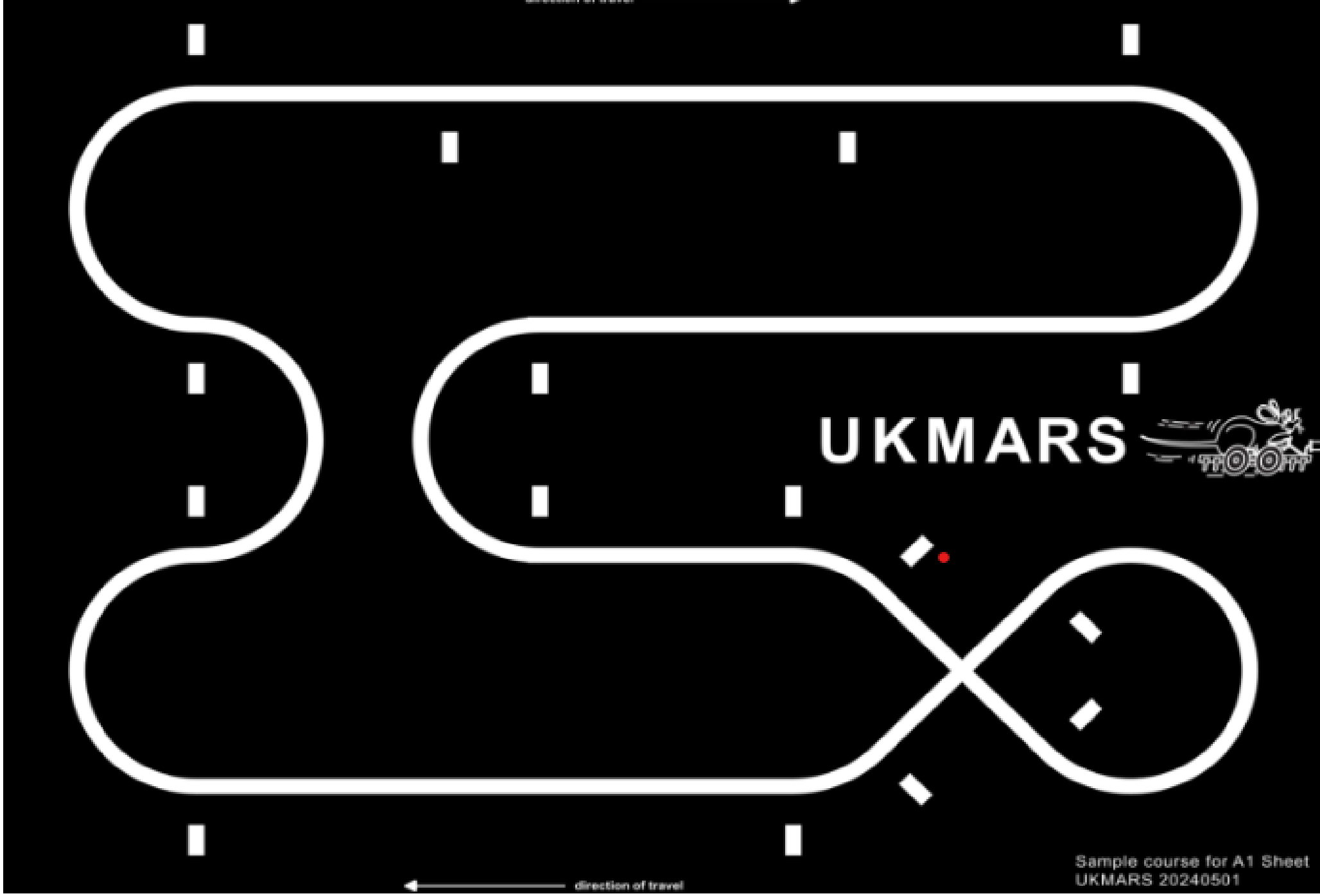
Meet The Team



Octavio Cristian Obiajulu

- Cristian Chavez Cruz- PM, Motors and Directional control
- Octavio Chavez- Power, Timer/Countdown trial
- Obi Isolokwu- PCB and Line Detection

Design Course



Design 1 and Design 2 Achievements

- Integration of subsystems
- Chassis completed
- Line detection
- Completion of course under 20 seconds
- Battery life of at least 40 minutes
- PCB design and completion
- Integration of button and display
- PID control

Acknowledgements

- Sponsor- Jeff Stevens
- Faculty Advisor- Jeff Stevens