



E2.10 - Torque Titans

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Sponsors: Dr. Fawzi Behmann, Texas State University

Overview

Torque Titan is a competition-ready sumobot that will locate and remove objects/opponents from the playing field without exiting bounds

Requirements

- Autonomous
- 13x13 cm
- 1.5kg for pushing and pulling
- Pull 1 kg in a straight line
- Push steadily increasing weight out of a ring
- Must shutdown after 3 second stall
- Start button with 5s delay

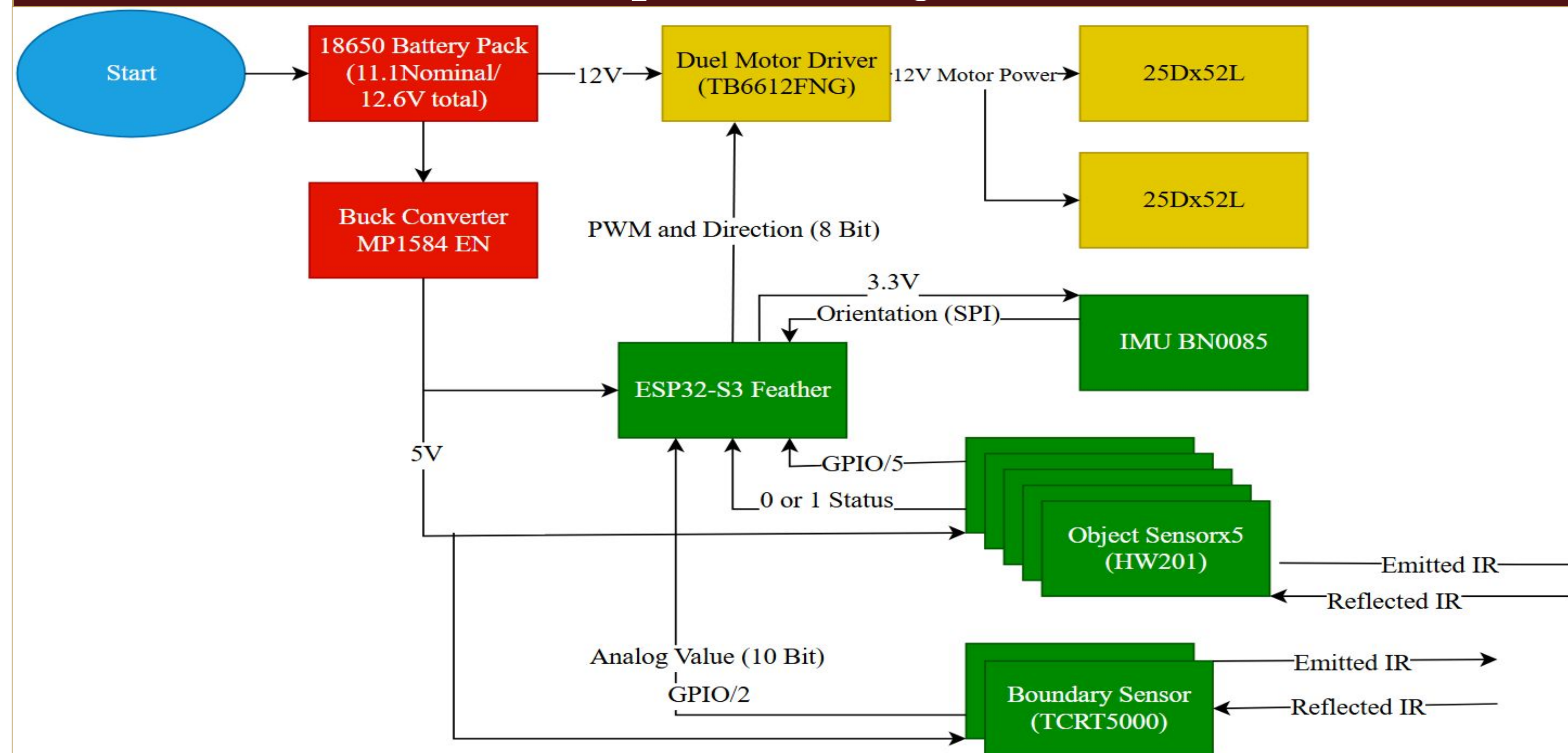
D2 Achievements

- Bluetooth and Wifi telemetry
- Benchmarked the motors 12.75kg/cm at 6v
- Enhanced Attack algorithm
- SMD utilized for enhanced “vision”

COST AND BUDGET

COMPONENT	QTY	PRICE EACH	SUBTOTAL COST
25DX52L	2	\$11.00	\$22.00
ESP32-S3 FEATHER	1	\$6.33	\$6.33
MP1548EN-DC BUCK CONVERTER	1	\$2.04	\$2.04
TB6612FNG MOTOR DRIVER	1	\$2.25	\$2.25
TCRT5000 IR SENSOR MODULE	2	\$1.5	\$3.00
HW 201 IR SENSOR	5	\$0.79	\$3.95
18650 BATTERIES	3	\$4.24	\$12.74
BN0085IMU	1	\$17.99	\$17.99
PCB	1	\$0.40	\$0.40
TOTAL UNIT COST			\$70.70

Top Level Diagram

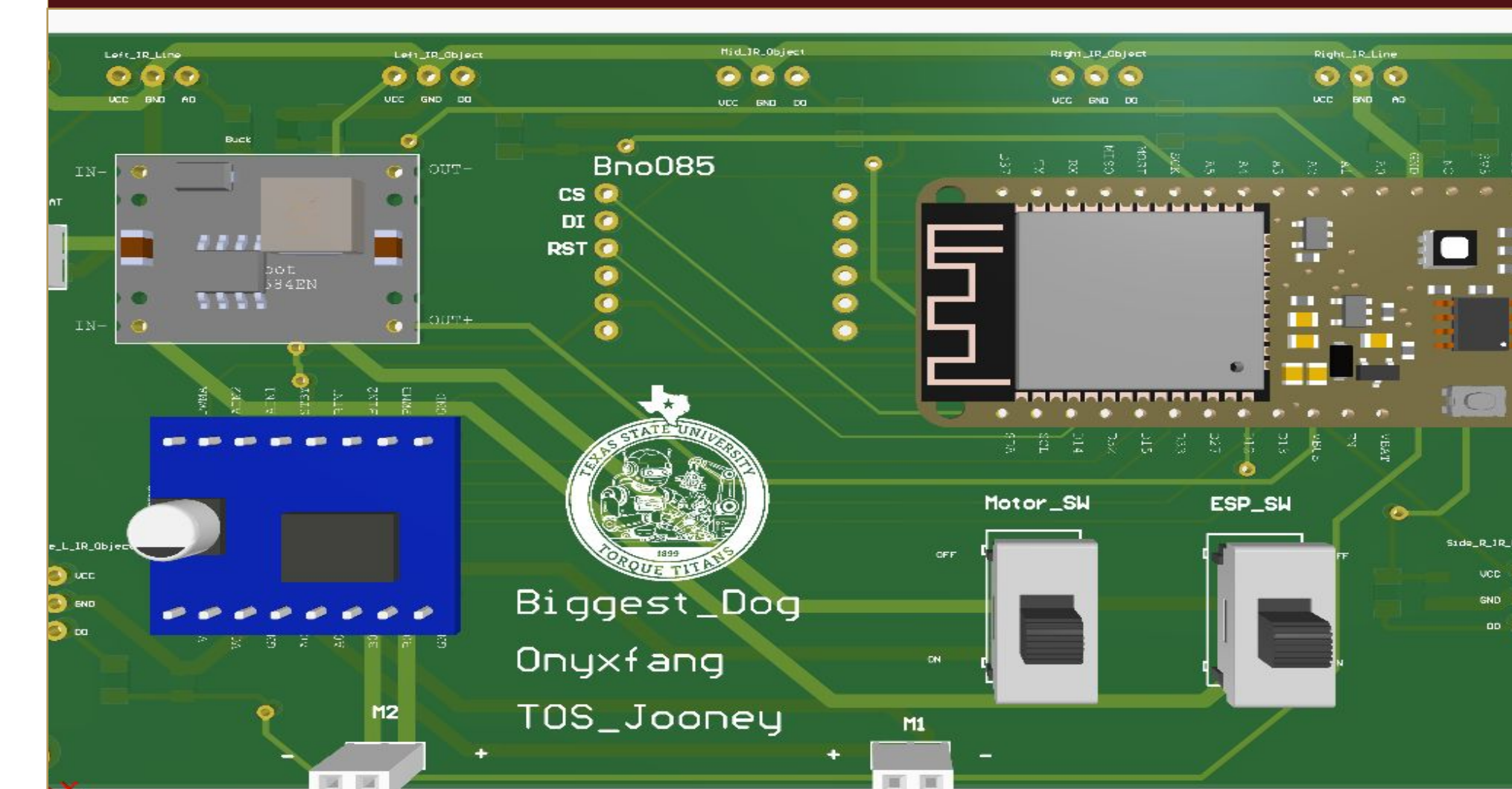


Meet the Team

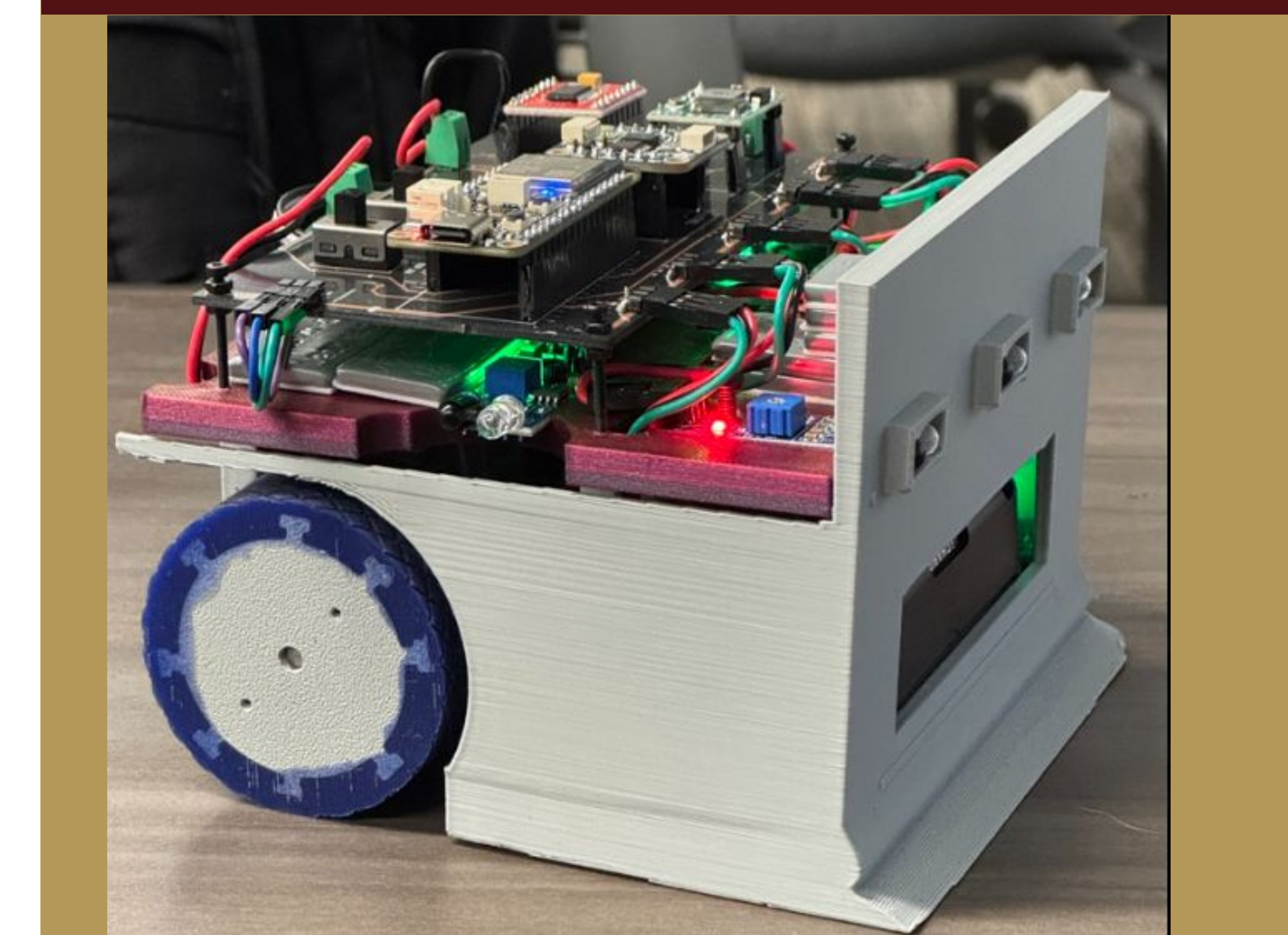


Bryan Arriaga, PCB/ Power
Gregory Neal Jr., Visual Detection
James Spence, Drivetrain

PCB Design



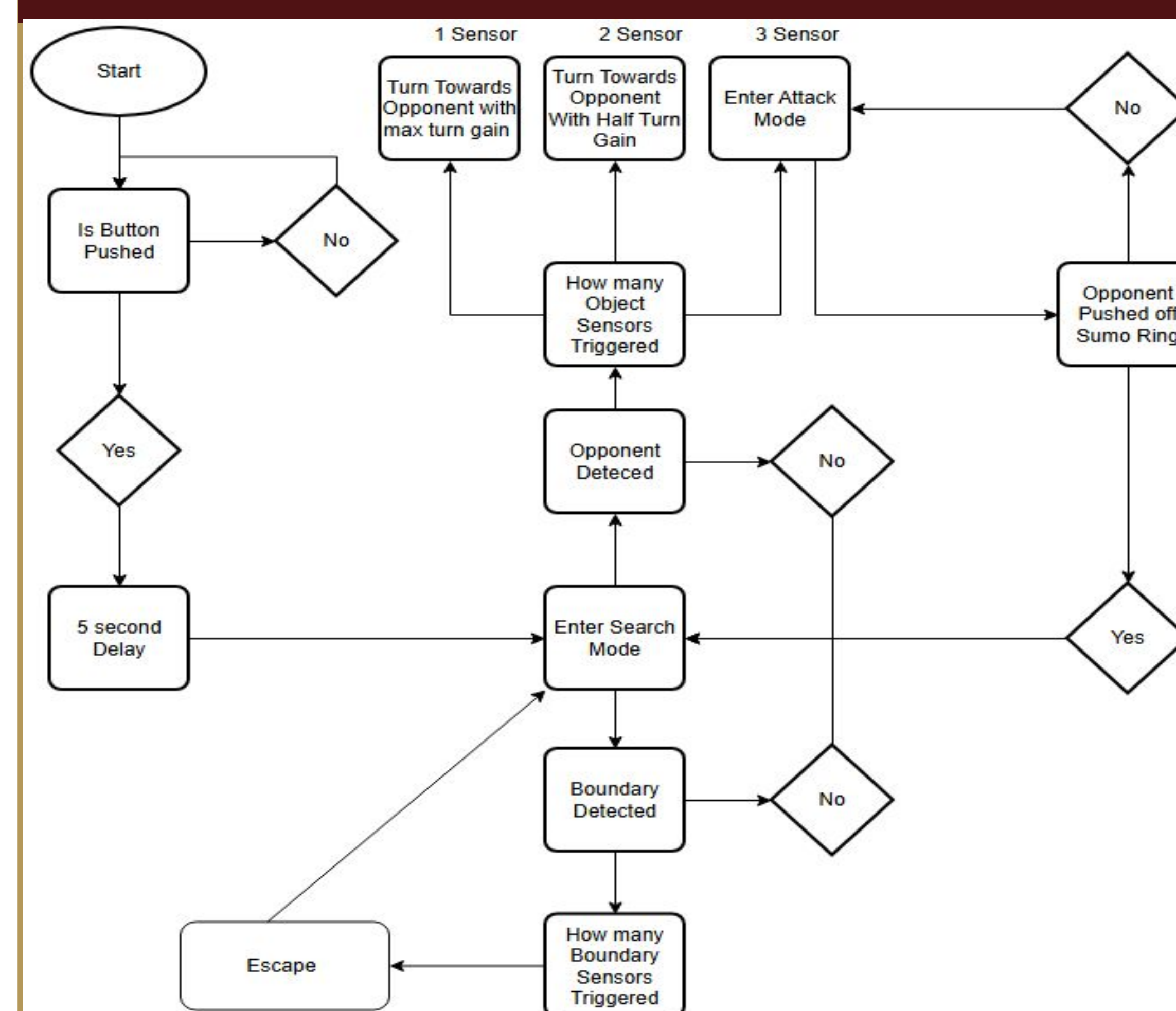
Chassis



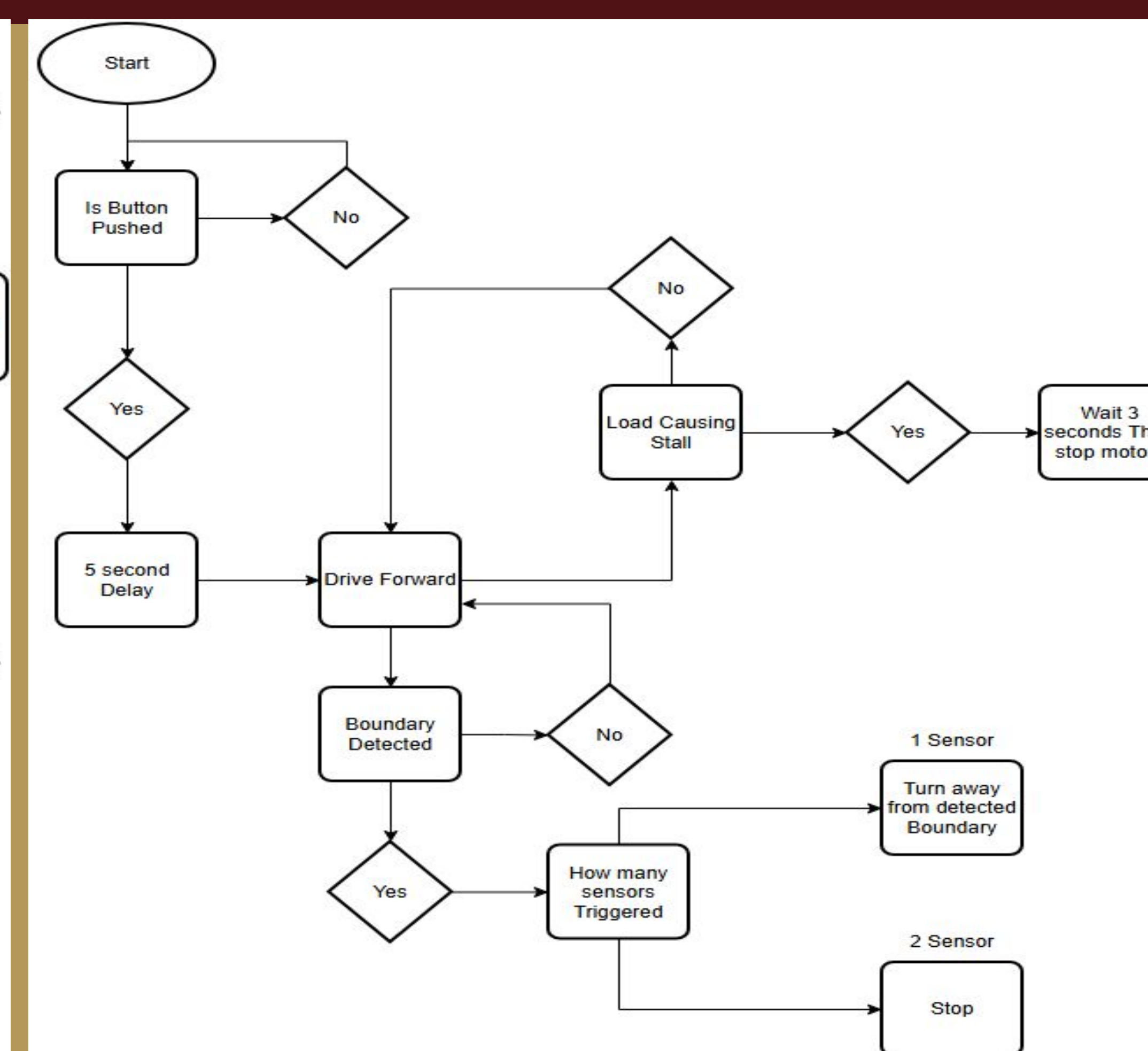
Acknowledgements

Sponsor : Dr. Fawzi Behmann
Faculty Advisor : Dr. Lawrence Larson

Sumo



Pull



The Course



Testing

- Setting color reflective sensor values to boundaries
- Measuring turning accuracy
- Verify detection angle of proximity sensors
- Battery run test: 22 Hrs under load