TEXAS STATE
INGRAM SCHOOL OF ENGINEERING

E1.10 - TorqueTug

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TORQUETUG SUMO ROBOT

Project Overview

Create an autonomous robot that pulls objects or opponents across a playing field and pushes objects or opponents out of a ring.

Design 1 Requirements

- **Subsystem Demonstration**
- **Boundary and Object Detection**
- **Push and pull 1000g block**
- **PCB Chassis Design**
- **Physical Constraints:**
  - Size: 15cm x 17cm
  - Budget: $90
  - Weight: 1000g(push), 1500g (pull)
  - Fully autonomous, no cameras, battery power ≤ 12V DC

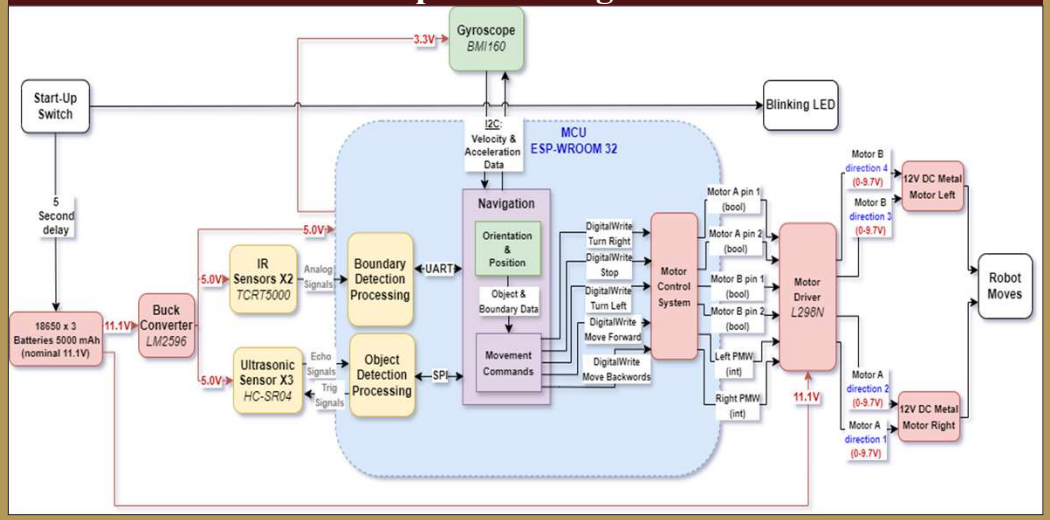
Design 1 Accomplishments

- Successfully detects objects and boundaries
- Capable of pulling and pushing 1000g
- PCB chassis completed

Design 2 Plan

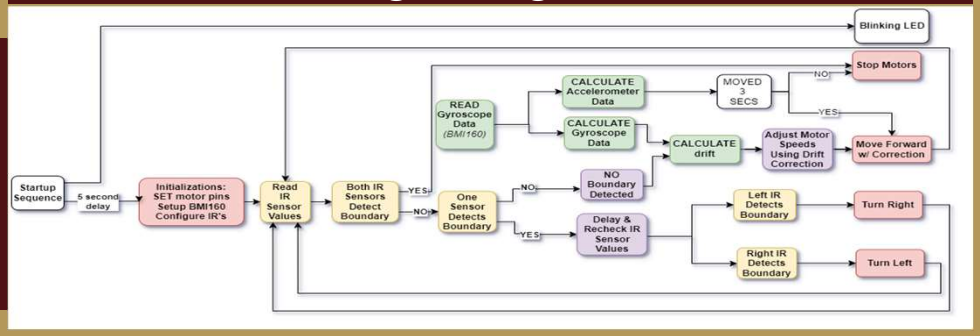
- Implement PCB chassis to reduce 40% of wiring
- Upgrade and integrate various sensors
- Thoroughly test each subsystem

Top Level Diagram

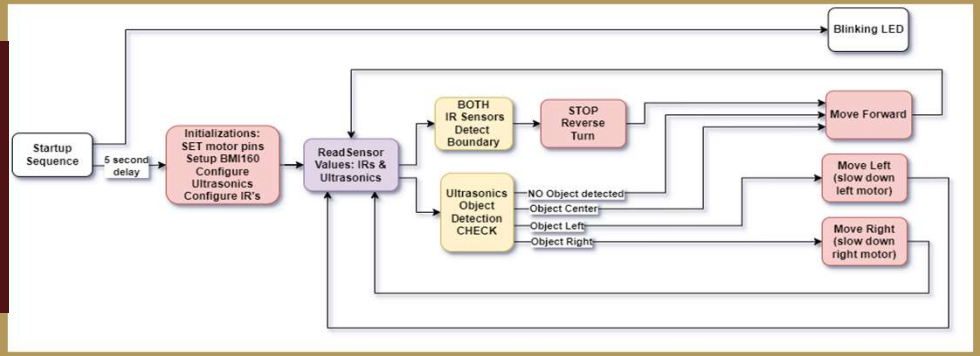


Navigation Algorithms

PULL



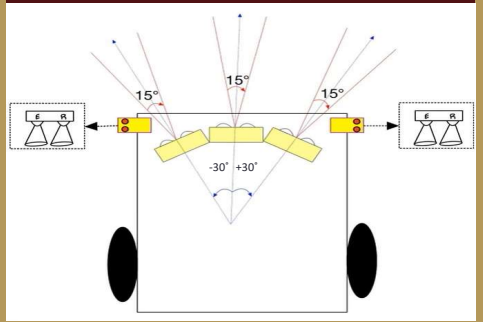
PUSH



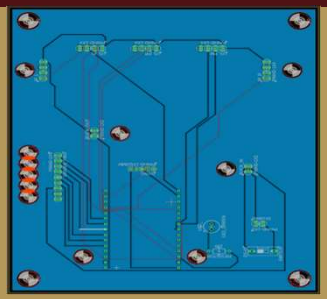
Team

Ira	Michael	Edgardo
- Motor Control - Power and Battery Life - PCB chassis design	- Boundary detection - Object detection	- Navigation - Orientation

Sensor Layout



PCB schematic



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