E1.12 - Kong

TEXAS STATE UNIVERSITY
Ingram School of Engineering

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Sponsor: Fawzi Behmann

Project **Overview**

Autonomous battery-powered robot engineered to push or pull a 1000-gram block and perform in a Sumobot competition.

Requirements

- Autonomous
- Up to 1000/1500 gram weight limit
- 13cm x 13cm
- $75 budget includes PCB
- No cameras allowed
- Requires start button with a 5 second countdown delay
- Must shut down at 3 seconds when motors are stalled
- Battery powered, ≤ 12VDC

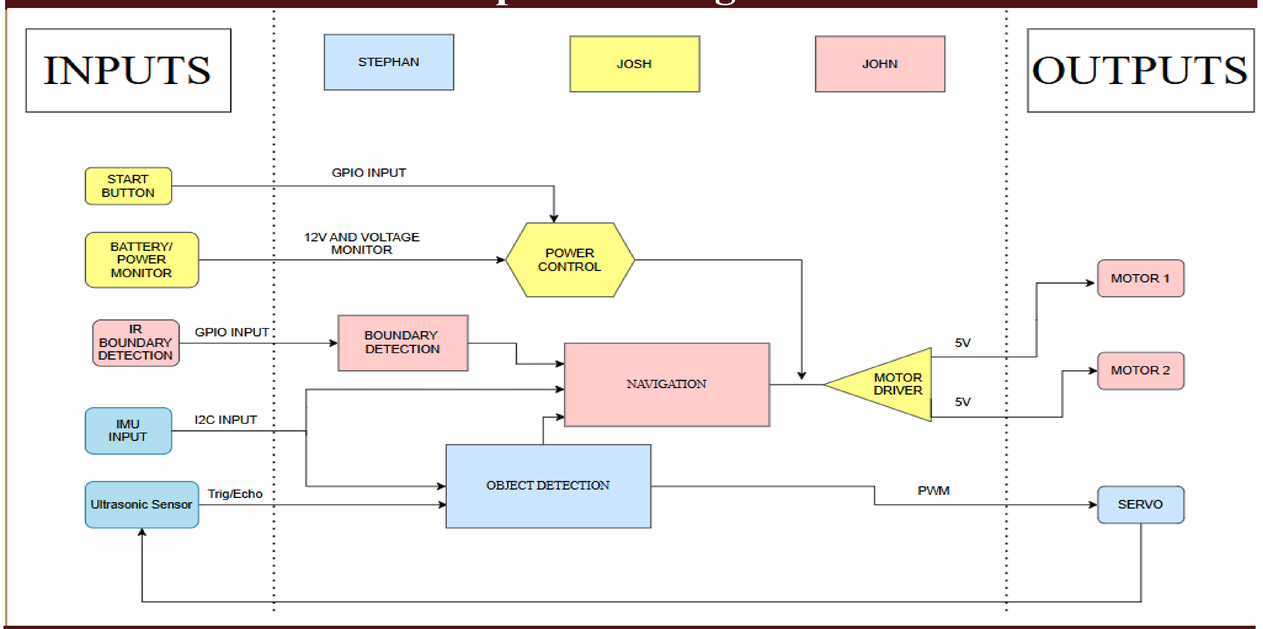
Bill of Materials

Component	Quanity	Price Each	Subtotal Cost
ESP - 32	1	$5.00	$5.00
HC-SOR4 Ultrasound Sensor	1	$10.00	$10.00
DRV8833	1	$1.33	$1.33
18650 Batteries	3	$6.33	$18.99
HW 870 IR sensors	3	$2.00	$6.00
Jumper Cables	1	$6.00	$6.00
TT motors 3-6V and Tires	2	$2.50	$5.00
SG 90 Servo	1	$1.50	$1.50
LM2596 Buck Converter	1	$4.88	$4.88
Start Button	1	$0.50	$0.50
Total			$59.20

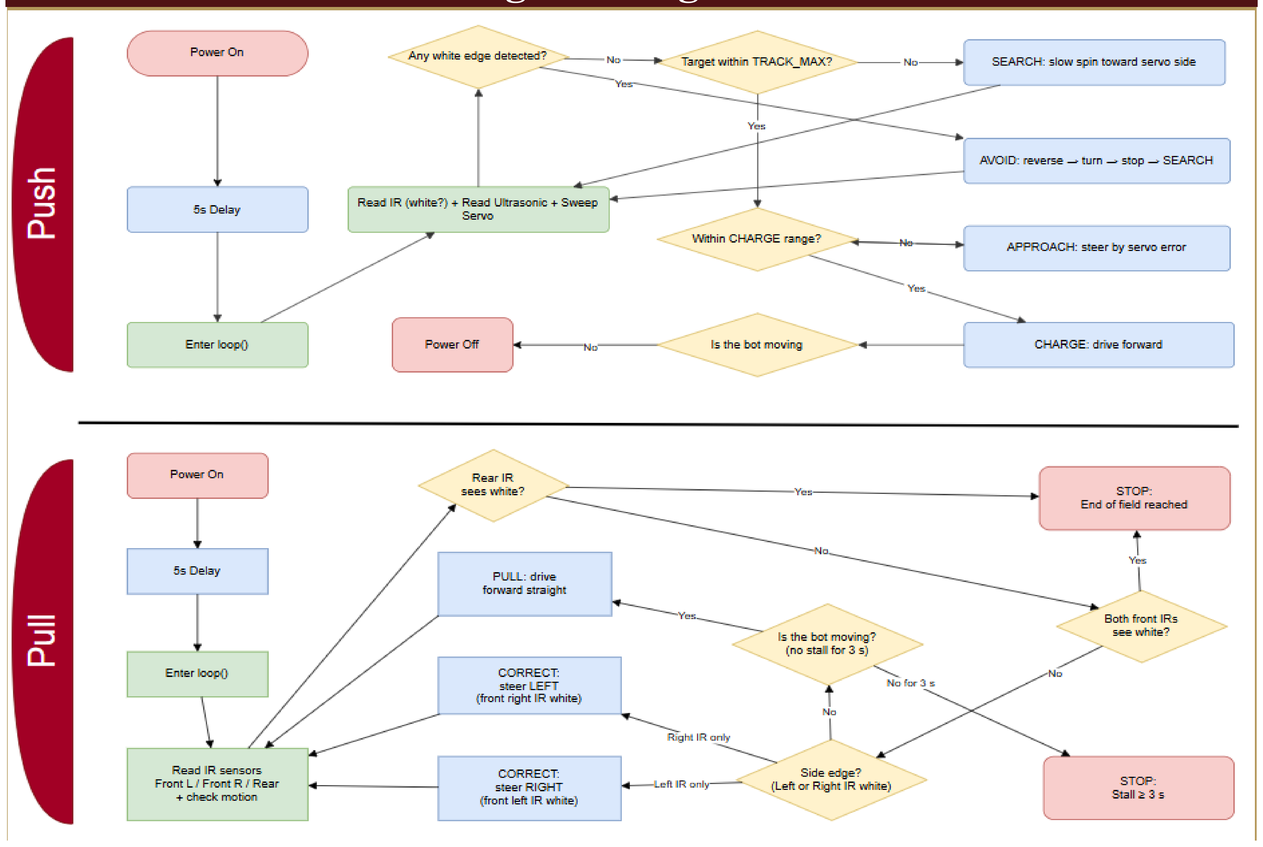
Design 1 Achievements

- Functional Sub-Systems
- Demonstrates boundary detection/object detection through push/pull 1000 gram block
- PCB design complete for Design 2

Top Level Diagram



Navigation Algorithms



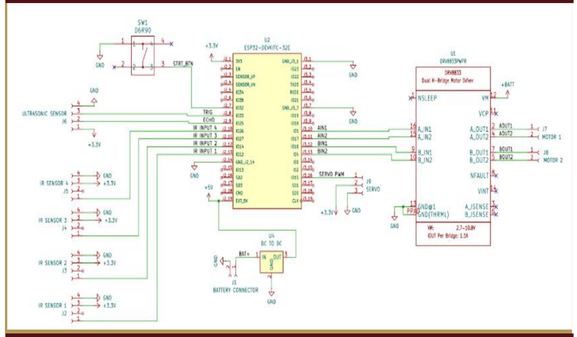
Meet the Team

Stephan	Josh	John
➢ Chassis ➢ PCB	➢ Power ➢ Motor control	➢ Boundary /Object detection

Design 2 Plan

- PCB fully completed
- Testing:
  - motor duration and different motors
  - battery life
  - motor speed
  - comand vs. actual
- Debug code to make sure every sub system works perfectly

PCB schematic



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