Race of Doom

Team 8

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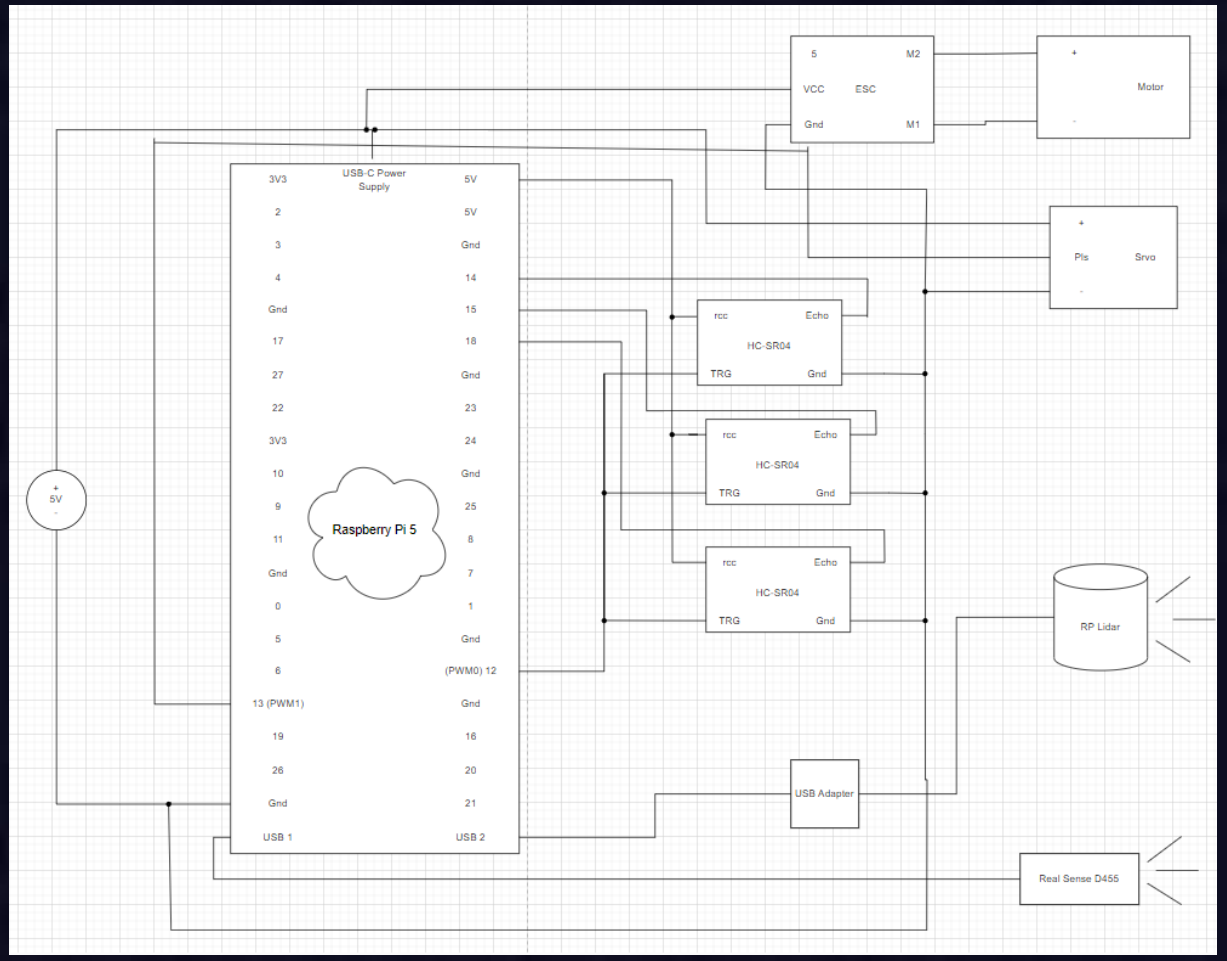
Project Overview

- *Creating an autonomous vehicle that can receive data from each group to allow for a "race"*
- *Get through different, real-world obstacles successfully*

- Obstacles include
  - People crossing the street
  - Stop signs
  - Bad guys popping up that need to be shot
  - Construction
  - Walls

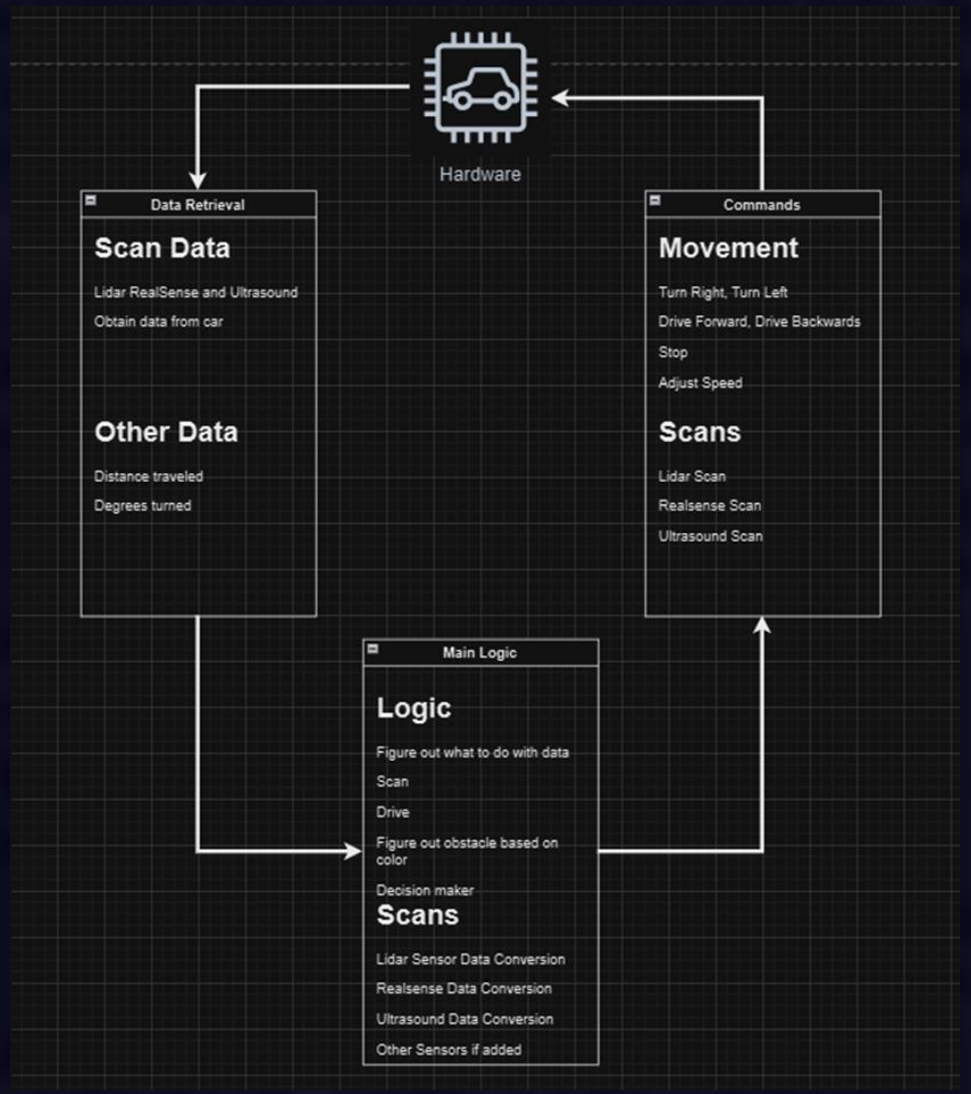
Hardware Design

- Raspberry Pi 5
- 7.4 V battery
- Sensors
  - Lidar
  - RealSense Camera
  - SR04 Ultrasound Sensors
- Traxxas RC Car
  - ESC
  - Servo



Software Design

- Hardware
- Data Retrieval
  - Scanner data
  - Other Data
- Main Logic
  - Computation
  - Instructions
  - Converting Data
- Commands
  - Movement
  - Scans



Functionality

Hardware

- *Scan*
- *Drive*

Raspberry Pi

- *Transmit Data*
- *Process*

Software

- *Logic*
- *Commands*

Perform

- *No crash*
- *Speed*

Technology Considerations

Raspberry Pi

- *Processing Power*
- *Bluetooth Connectivity*
- *Availability*

Arduino

- *Processing Power*
- *Bluetooth Connectivity*
- *Availability*

Computer Processing

- *Latency/speed*
- *Bluetooth Connectivity*
- *Ease of use*

Processing on board

- *Latency/speed*
- *Bluetooth Connectivity*
- *Ease of use*

Sensors

- *RealSense*
- *Lidar*
- *UltraSound*
- *Color*
- *Simple Camera*
- *Processor Specific*
- *Connectivity*

Car

- *Motor*
- *Battery*
- *Electronic Speed Control (ESC)*
- *Wired Connection*
- *New Car*
- *2 Cars*

Areas of Concern and Development

Concern 1: Processing Power/Speed

-Do we have enough processing on the Raspberry Pi to processor these sensors quick enough

-Is connecting it to a computer via bluetooth more effective

Development: Trial and Error

Concern 2: Budget

- Can we create what we want within budget

Development: See what is available and if it works first

Concern 3: Connectivity Issues

- Ability to connect processor with all sensors and work cohesively

- How to connect processor to computer potentially

Development: Trial and Error

Concern 4: Course Construction

- Are our obstacles do-able

Development: Make obstacles last, see what we have and propose to Bigelow

Conclusions

- *We will use the sensors we have first and if there needs to be improvement look online for alternatives*
- *Raspberry pi is the best processing option we have so we will run with it*
- *Trial and error through test runs will be our primary source of data gathering and allow us to adapt our vehicle for more positive results*

Thank You!