CSC615

Group Term Project

TEAM: Fire Hawks

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Description:

This task involves building a car that is able to follow a black line while clearing obstacles. The design needs to be able to hold all parts (sensors, breadboard, raspberry pi, etc.) effectively while allowing for data input. At the end of the course, the car should detect a red line and make a full stop.

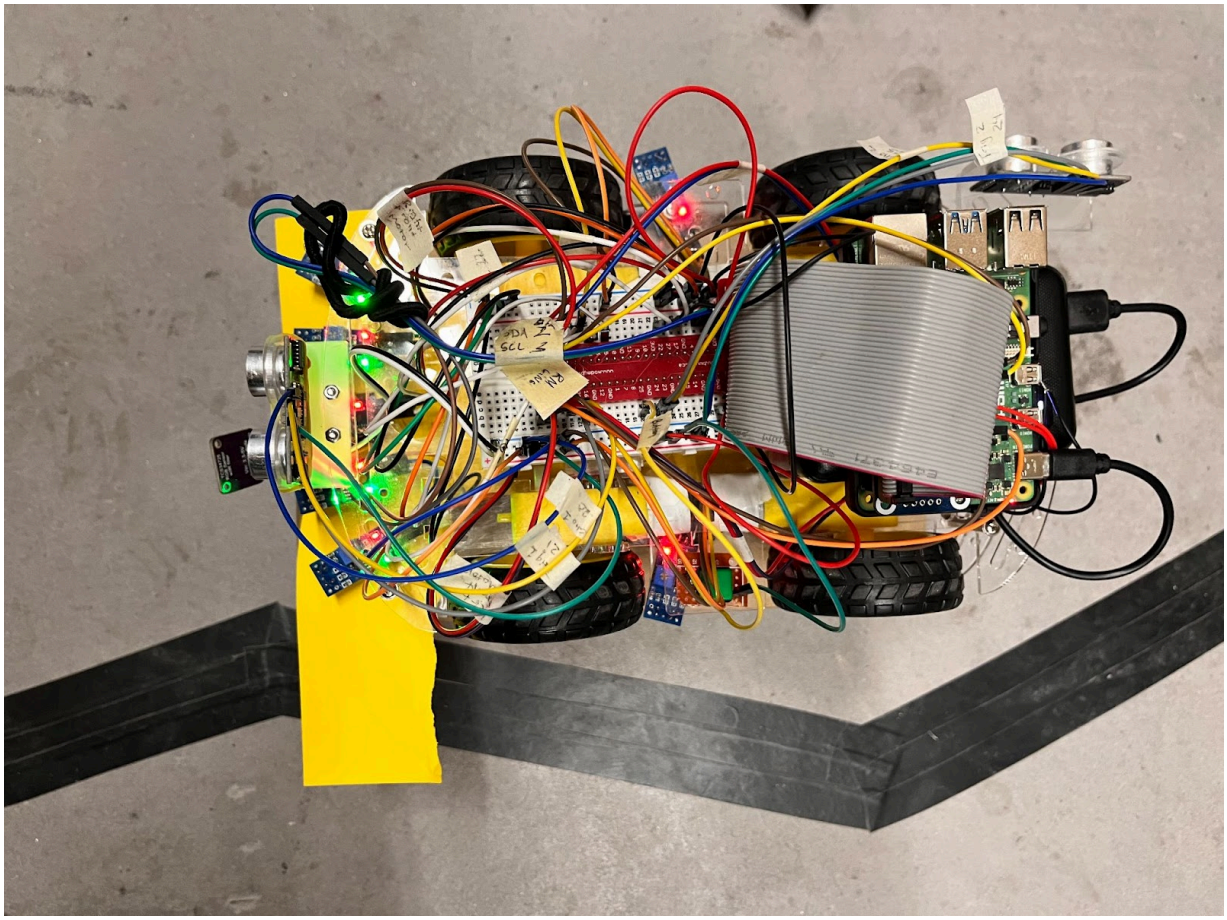
Building Car

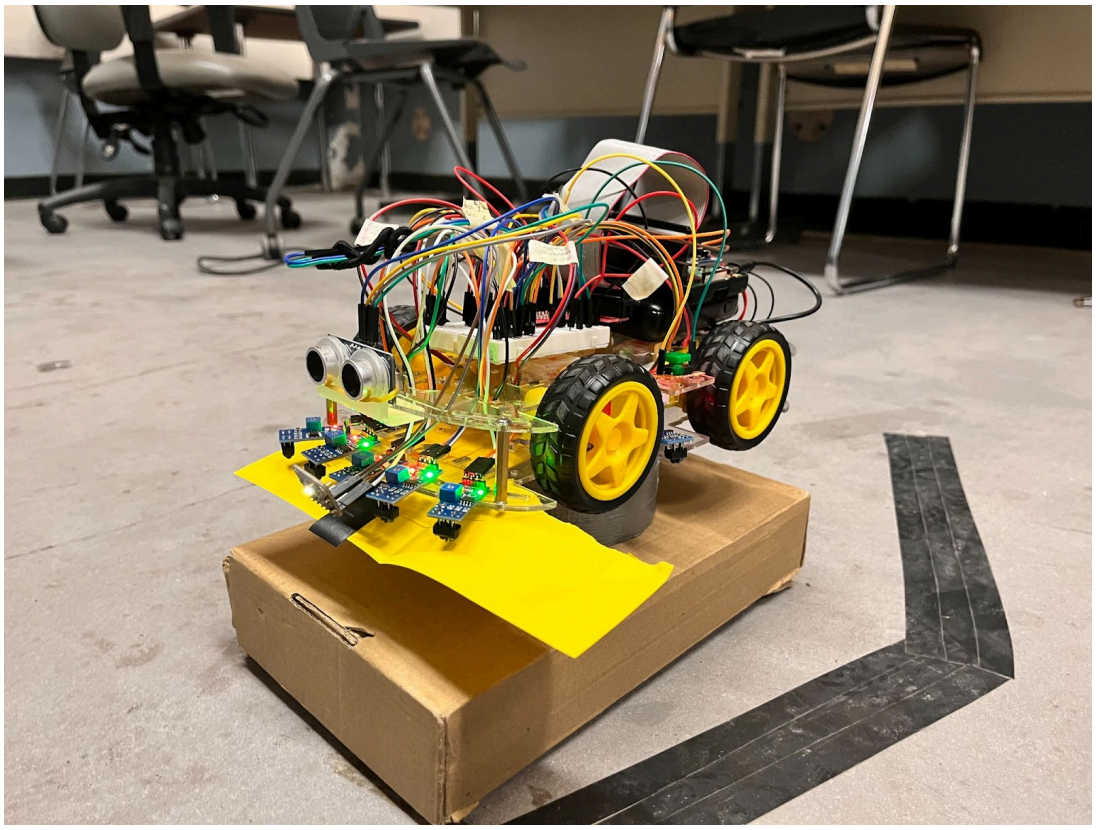
Front of car:
- 5 line sensors
- Echo sensor

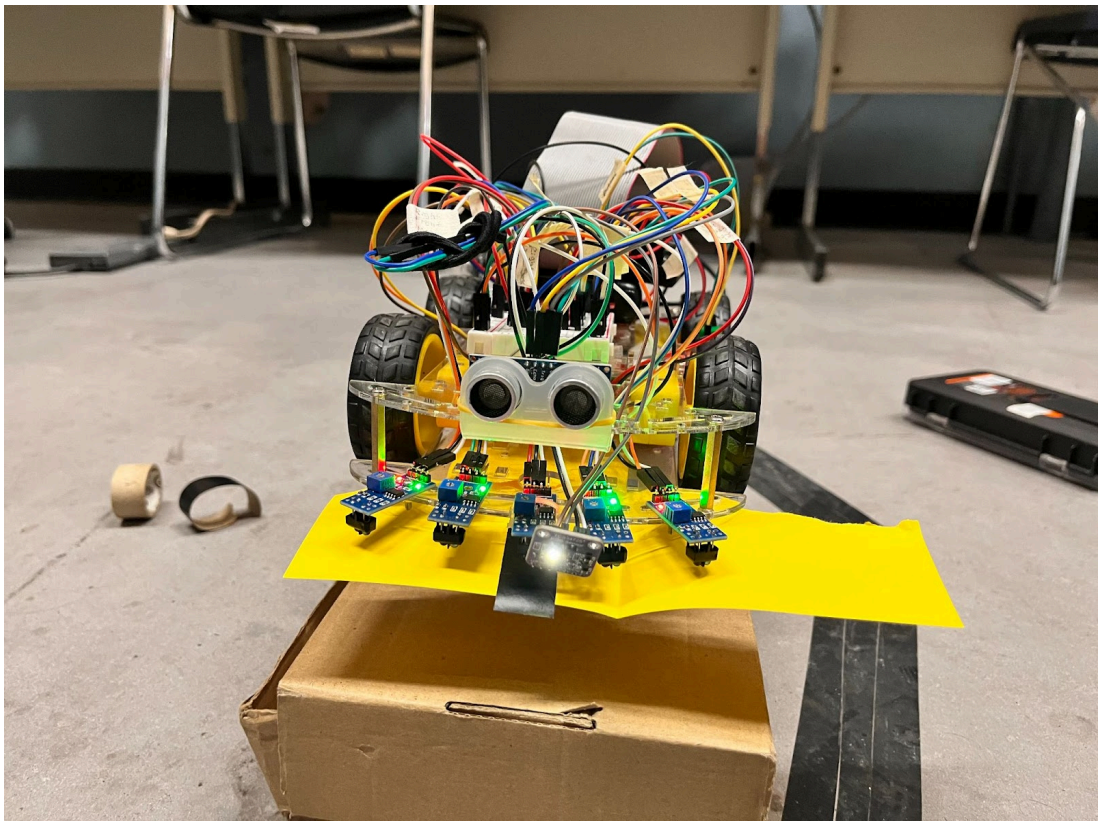
Right side of car:
- Echo sensor

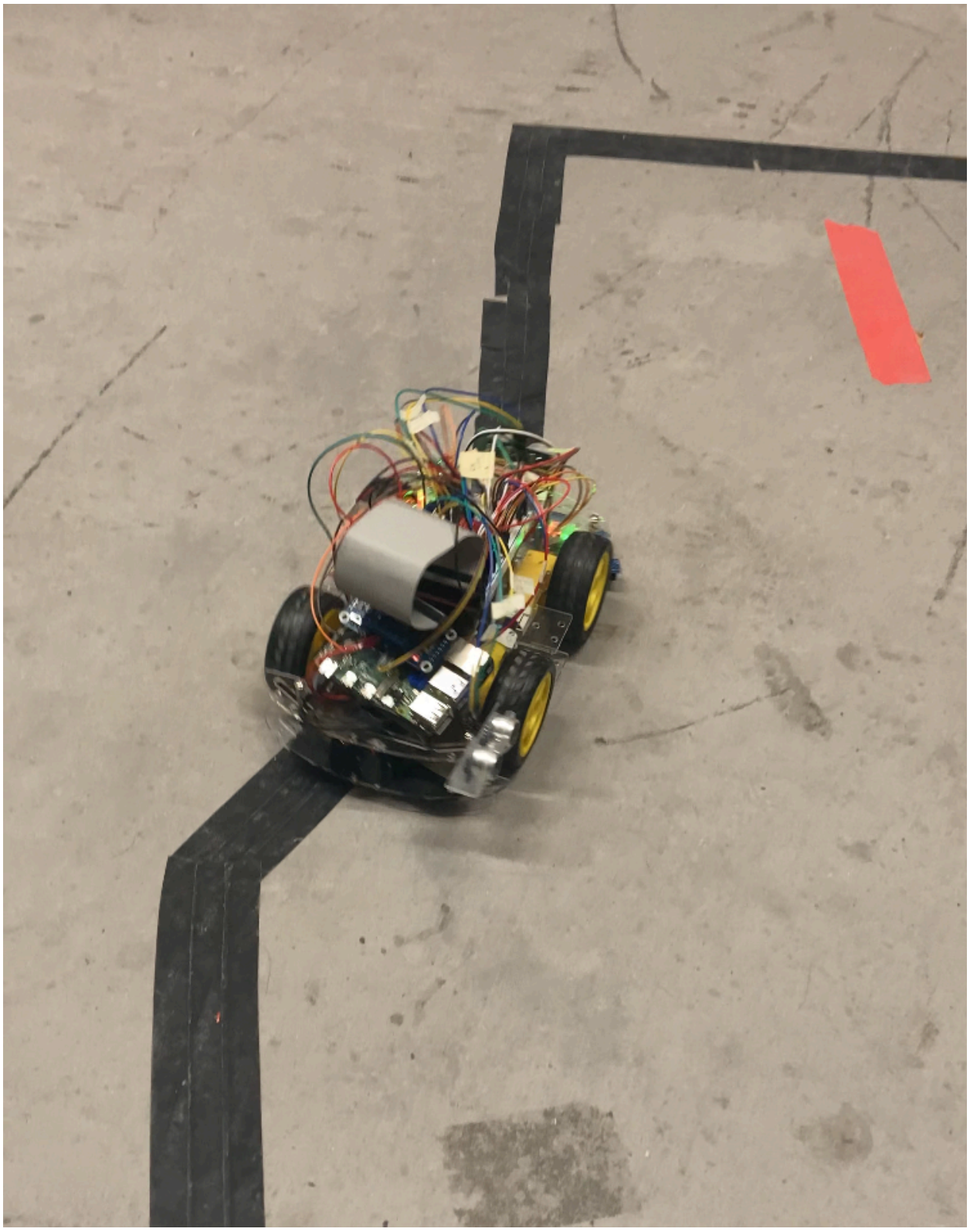
Under the car:
- RGB sensor

Side of car:
- Button



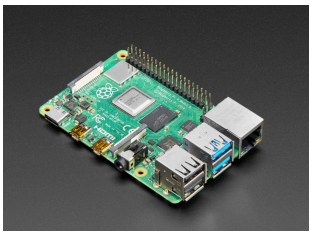
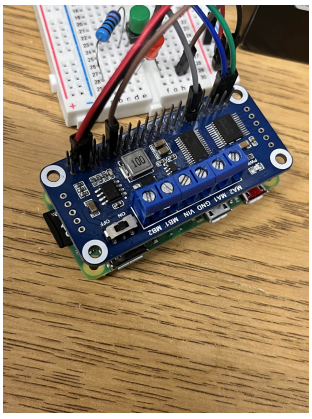


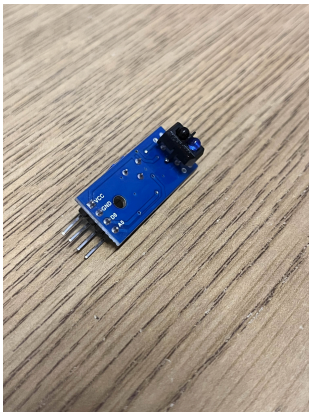
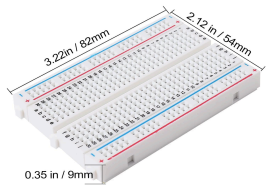


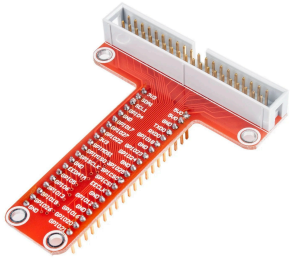
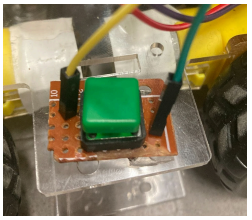


Parts and Sensors Used

(include photo, and part numbers where applicable, such as HC-SR04 for the sonic echo sensor)

Part Name	Descrition	Image
ZK-4WD	Smart Robot Car Chassis with 4-Wheel Drive includes: ☐ 2 X Car Chassis (Acrylic Material) ☐ 4 X DC geared motor (magnetic over EMC testing) ☐ 4 X Yellow wheels ☐ 4 X 20 line speed encoder (non-ordinary six-lane ten-wire) ☐ 8 X Fasteners ☐ 1 X 3D assembly drawings ☐ Several pillars screw nut	
Raspberry Pi 4B (x1)	Processor GPIO pins Input power: 5V DC via USB-C	
Waveshare Motor Driver HAT (x1)	Integrate PCA9685, supports 12 bit PWM output Integrate TB6612FNG, high performance Integrate 5V regulator,	

Infrared Reflective IR Sensor (x5)	PartNumber: TCRT5000 Line Track Sensor	
Echo Sensor (x2)	PartNumber: HC-SR04	
AINOPE Portable Charger 10000mAh Power Bank USB C	Power ON Raspberry Pi ☐ USB-C Cable	
Breadboard	Solderless Board Kit for Raspberry pi	

Breadboard Jumper Wires	Connect sensors to breadboard	
GPIO extension board	Connect Raspberry Pi GPIO pins to Breadboard.	
9 Volt Battery Clip (x2)	Clip to connect 9V batteries for motor power.	
9 Volt Battery (x2)	9V batteries to power on motors..	
Button (x1)	Start Program with button.	
Double Sided Tape Heavy Duty	Attach items to board	

Hardware Diagram