PROJECT REPORT [COAL CS-235]

Project Name:

Group Members:

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Introduction:

Mobile App controlled Bluetooth car, with auto obstacle detection, avoidance, and braking. All wheel drive with neutral steering. Turn Indicators and Brake/Stop Lights. The CyberTruck's Design is based on the recently debuted Tesla's CyberTruck.
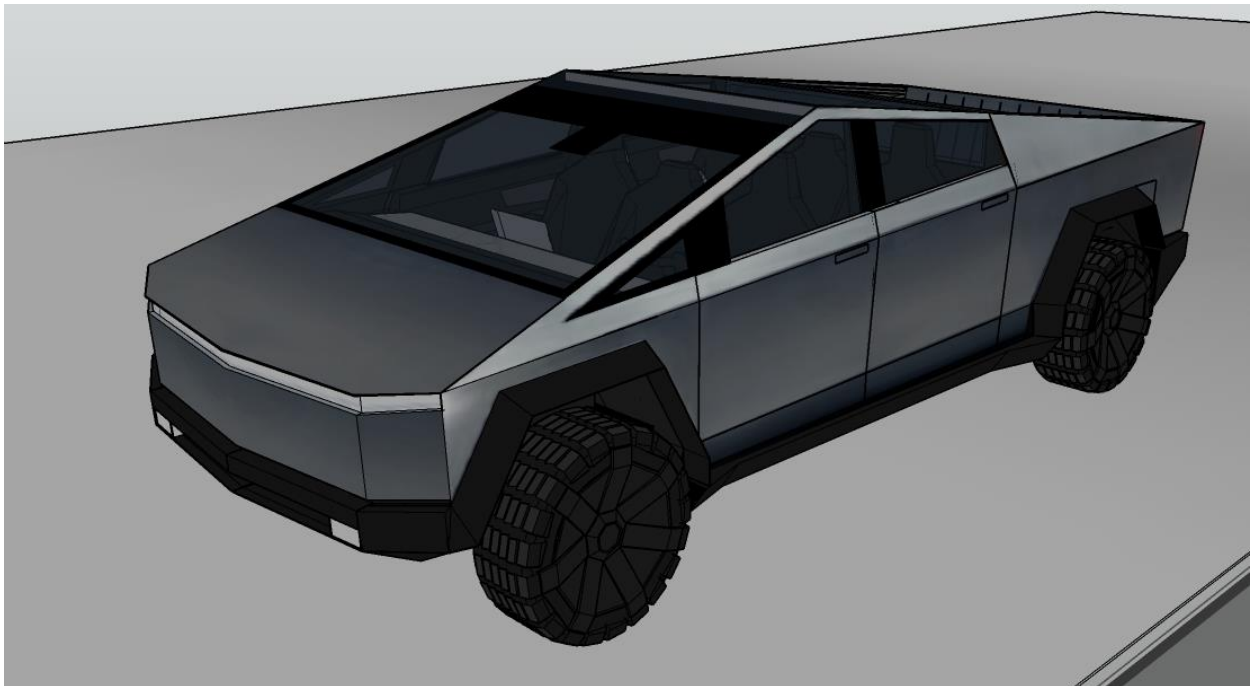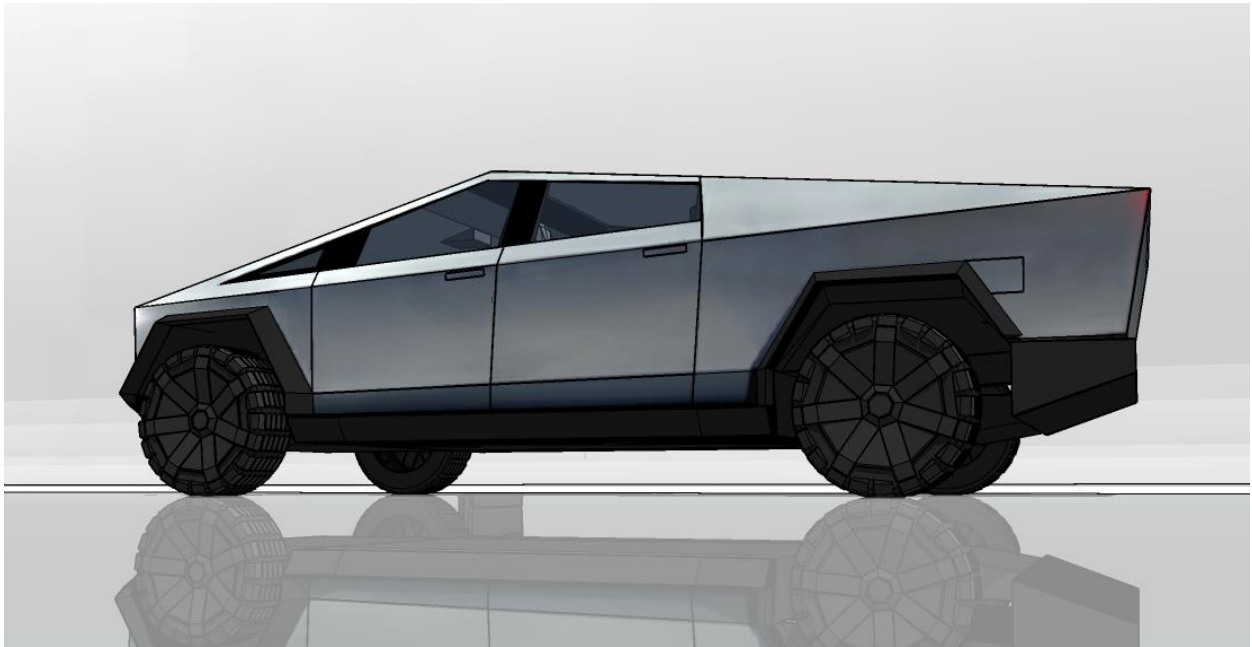
Components List:

- Arduino Uno
- HC-SR04 Ultrasonic Senor
- HC-05 Bluetooth Module
- Male to Male ribbon cable
- Male to Female ribbon cable
- Hard Wire
- Soft wire
- 4x 6v DC geared motors 100 rpm
- L298N motor driver module
- 30x Lights: White, Red, and Yellow
- 2x li-ion 5000mah battery
- 2x Battery Charger
- Screws: varying sizes
- Android Phone
- Wood body panels and frame
- Various tools
- Glue gun
- Silver Spray paint

Project Details:

The CyberTruck is controlled through Bluetooth controller app (Bluetooth RC Controller) on an Android smartphone, CyberTruck has Bluetooth Module (HC-05) to receive the signal and transfer it to Arduino. The logic is burned to Arduino, which on signal reception outputs the respective signal to Motor Driver Module(L298N). All 4 geared motors are connected to Motor Driver Module.

The whole truck is powered by 2x Lithium-ion 3.7v 5000mah batteries connected in series to Output 7.4v giving it about 4hours of runtime. The power is received by Motor Driver. Arduino is powered by the 5v output from the motor driver and all the components have common ground.

Ultrasonic Sensor HC-SR04 is placed in the front grill of the truck to detect obstacles in the front, Ultrasonic sensor sends out a pulse and receives it back and gives Arduino the time taken for pulse to be received, Arduino Logic calculated the distance of the reflector object from CyberTruck's front and once the distance reaches proximity of 19cm the Truck Stops and reverses 30cm from its current position.

CyberTruck is programmed not to move if no Bluetooth Connection is Available, once Bluetooth controller is connected the vehicle moves based on signal and starts detecting obstacles on the front.

Logic Flowchart for the Arduino Code
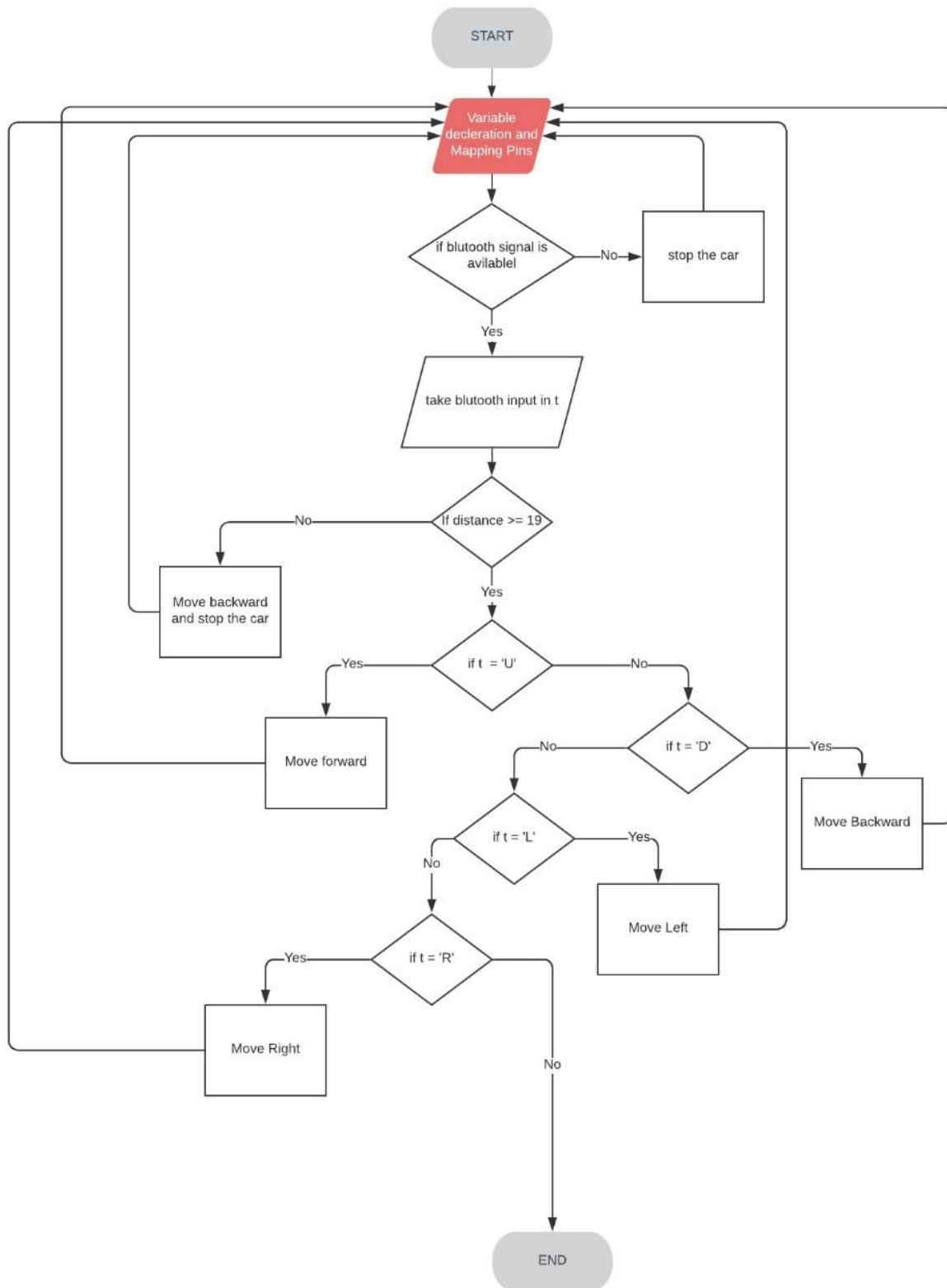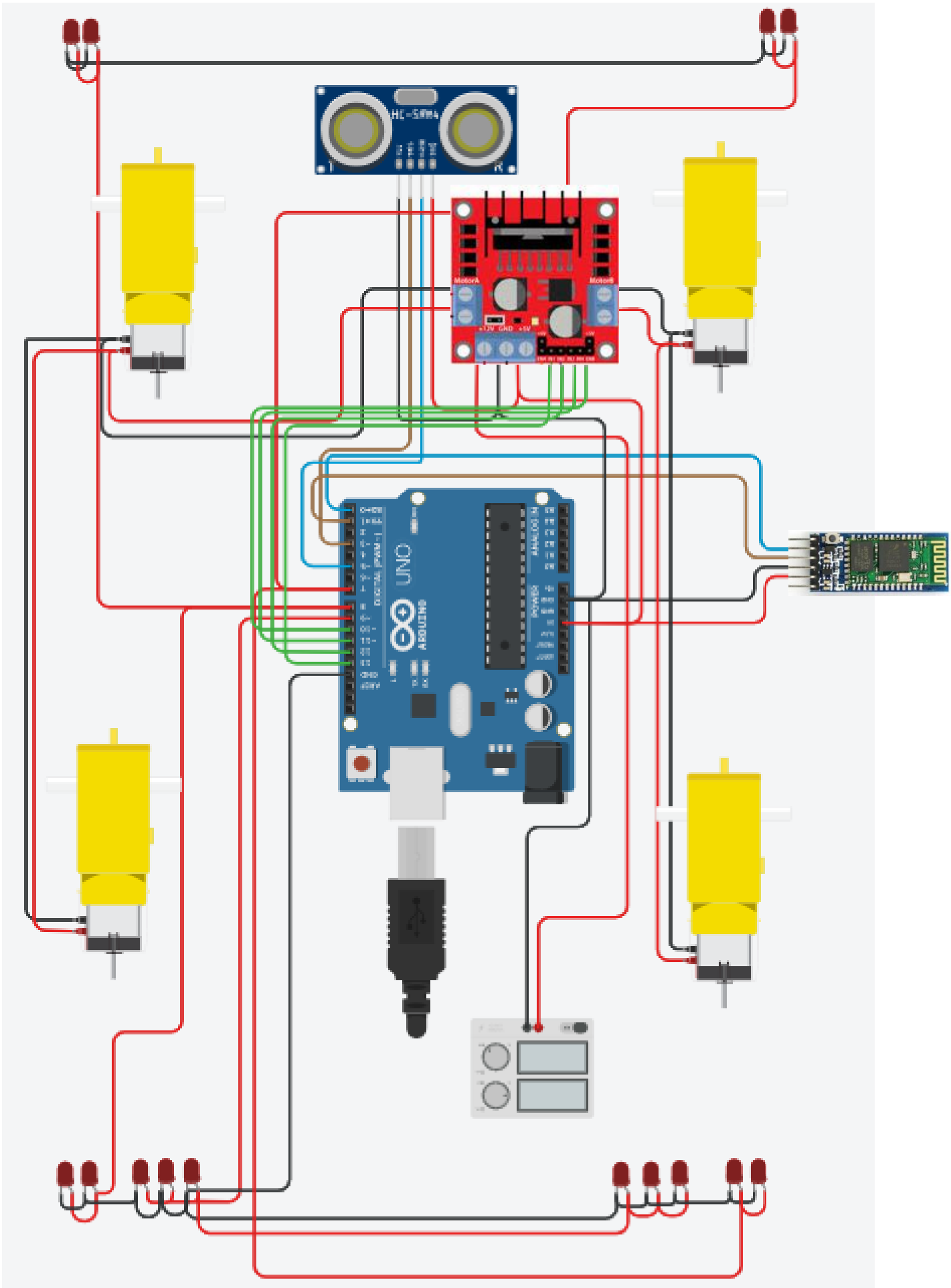
Real World Application:

Collision avoidance in manual, semi-autonomous, or autonomous vehicles.

Parking assist for vehicles in tight spaces.

Mobile controlled parking.

Smart surrounding awareness for vehicles.

Conclusion: It was a real fun project to work on. It took nearly 30 hours of pure craftsmanship to make the body panels and frame out of wood and the detailing after assembling all the parts. Coding and testing took about 4 hours. Hardest part was finding all the components we needed.