

Semester Project - RC Car

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COMP 522
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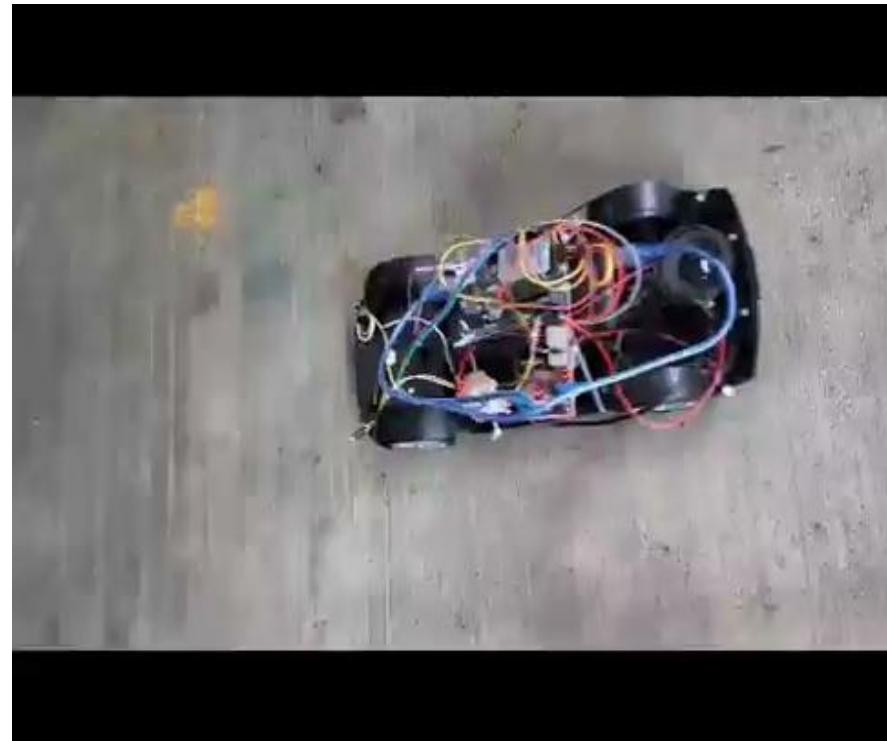
Implemented Project

- Arduino Powered RC Car

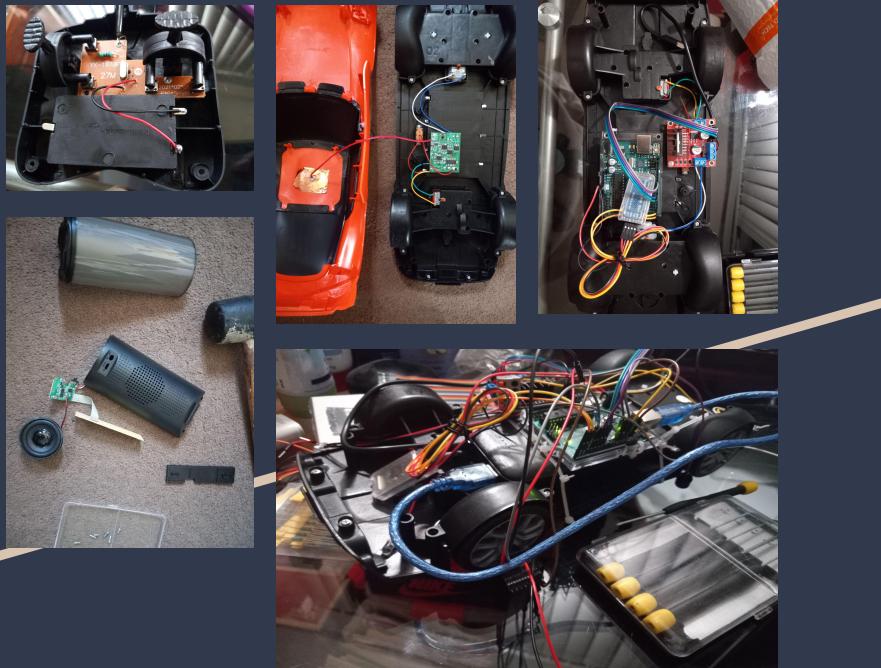


Status of Project

- Project Status: Finished, but improvements can still be made



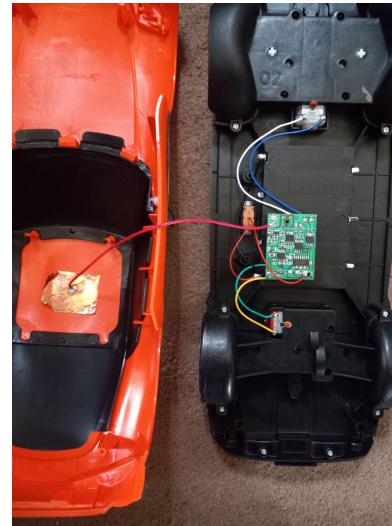
Steps taken to implement project



1. Evaluated RC Car (took everything apart to see how and what made it run)
2. Gathered the materials/tools for the project
3. Assembled the parts related to the car's movement
 - a. I cut out the original RC Components (PCB, Original Wires connecting to the PCB, etc.)
 - b. I cut and stripped the wires going to both DC motors
 - c. Connected the DC motor to the L298n H Bridge and connected the bridge to the Arduino
 - d. Connected the HC-06 Bluetooth Module to the Arduino
 - e. I cut a USB cable and stripped the wires
 - f. I then connected the USB cable to the portable battery and the L298n bridge's 12v pin
4. Took the code from different tutorials and tested the RC car
5. Added Lights and Buzzer
6. Tested and debugged
7. Added Music player and music
8. Tested and debugged

How many hours I spent?

- Started the project around March 18
- Finished the project around May 14
- Worked on the weekends and Fridays on it.
- Approximately, 100 hours more or less. This includes assembling, debugging the software and hardware



Did I make use of code I didn't write?

How did I debug?

How long it took to debug?

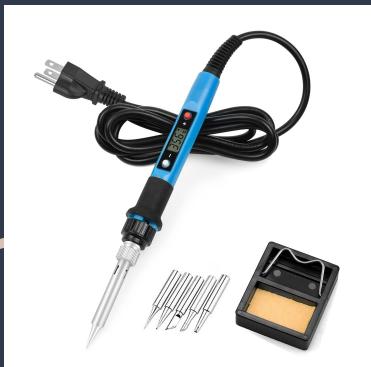
- Attempted to reuse code from some Tutorials relating to each part
 - E.g. Bluetooth HC-06, L298N Drive, etc.
- Ultimately I heavily modified the code to
 - Make it compatible with the 3rd party app I used
 - Make it perform the tasks I wanted it to perform
 - Make it work with FreeRTOS
- I tested each component separately and then tested all of the components together
- Debugging took the majority of time spent on project, therefore maybe 80 hours more or less
 - Reading
 - Watching videos
 - Attempting solutions

Main Issues to note

Key issues I ran into:

- Implementing FreeRTOS into project
 - Had trouble multitasking (e.g. playing music and RC car at the same time)
- Using 2 serial input/output in a program (utilized software serial since Arduino only has one set of serial hardware)
- Hardware
 - Had trouble finding a place to power all items
 - Some of the connections were unreliable
- Build is Fragile overall
 - I dropped it multiple times by accident so some connections ended up getting damaged

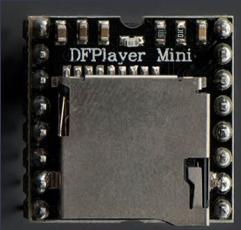
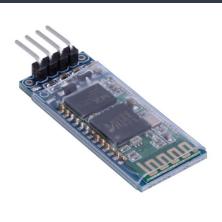
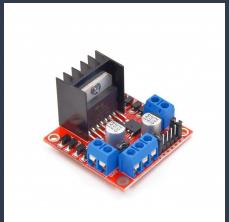
Tools



- Precision/Hobby Screwdrivers
- Soldering Iron (optional)
- Scissors
- Pliers
- Wire stripper (optional)
- Zip Ties
- Tape

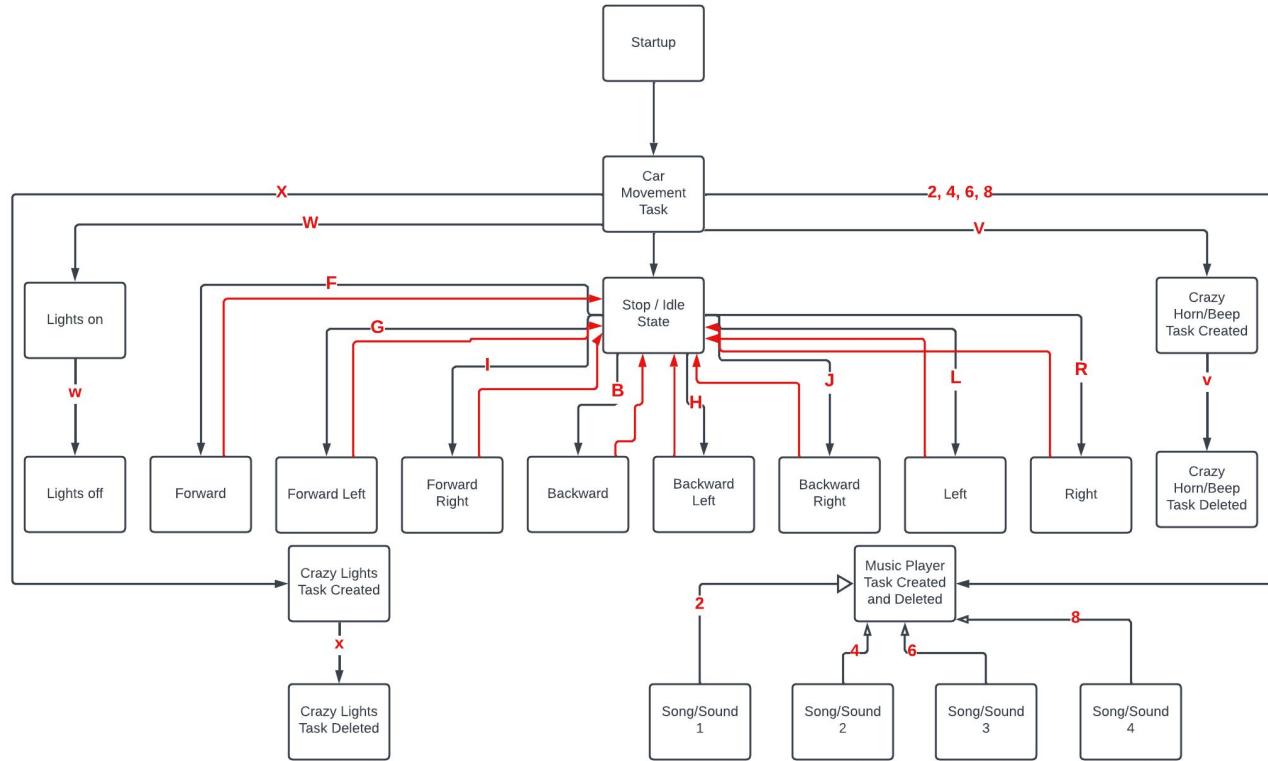


Materials

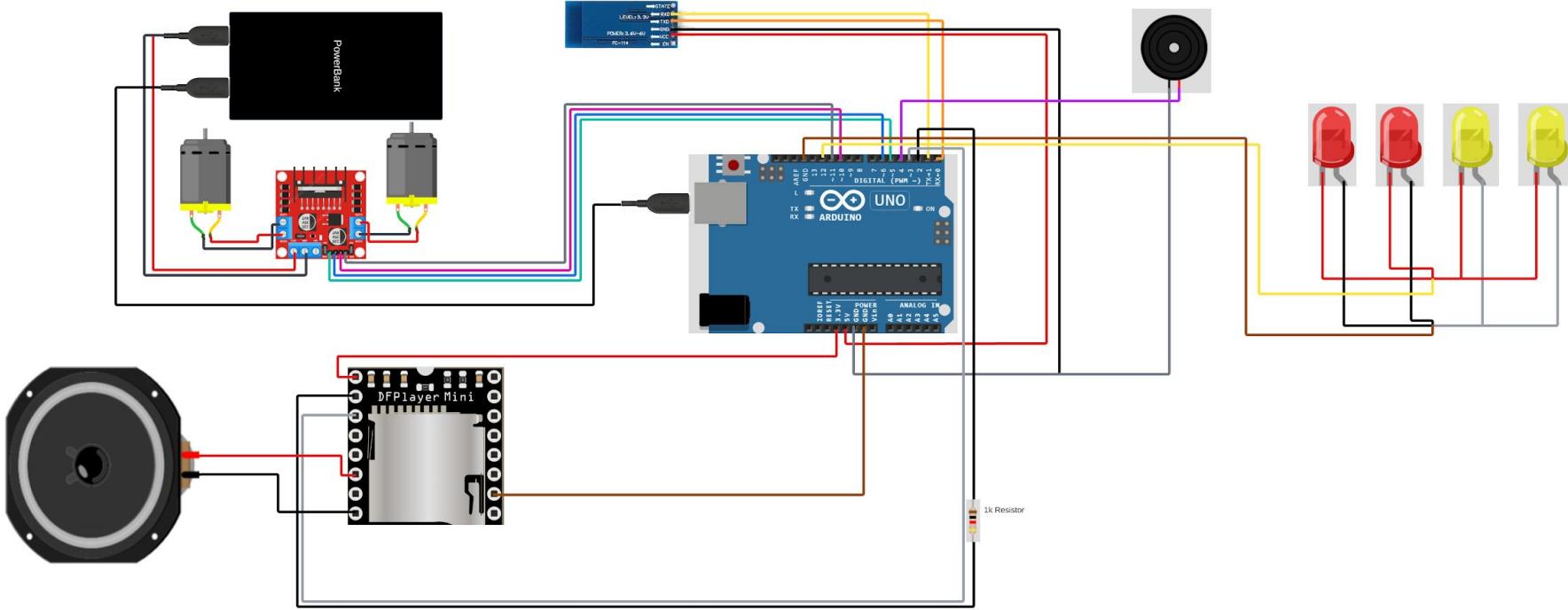


- RC Car base (Came with DC motors, frame, etc.)
- L298n H Bridge
- HC-06 Bluetooth module
- HiLetgo DFPlayer Mini MP3 Module
- Micro SD Card
- Female to Female Dupont jumper wires
- Portable Power bank
- USB Cable
- Speaker
- 1 in 4 out Terminal Blocks (I tried to not solder wires, but eventually I did)
- LEDs with Dupont connectors

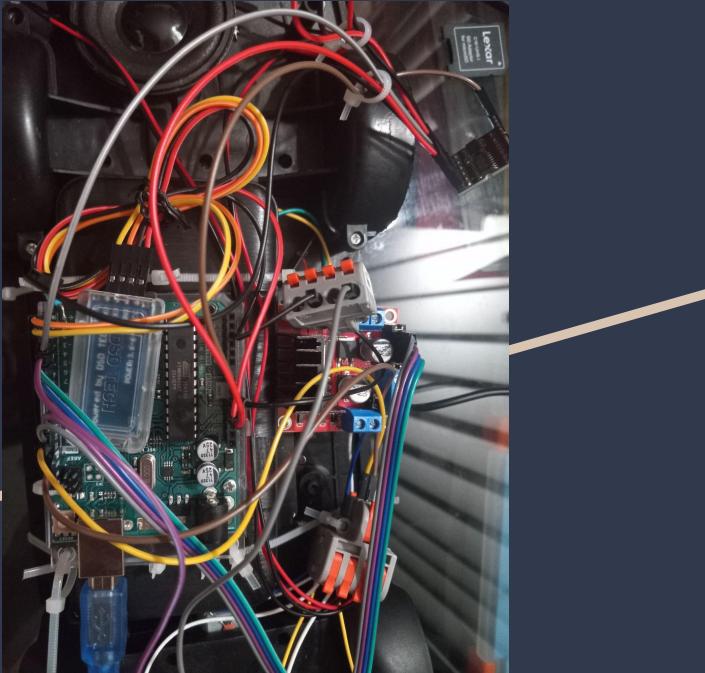
State Diagram



Circuit Diagram



Improvements for the Future



- The project is done for the most part, but the following improvements can be made:
 - Moving to a bigger frame
 - Better/Stronger DC motors (possibly servo motor) to increase speed
 - Better steering system to increase maneuverability
 - Smaller portable battery to decrease weight

