

Hand Gesture Controlled Robotic Car

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Initial Proposal

Hand Gesture Controlled RC

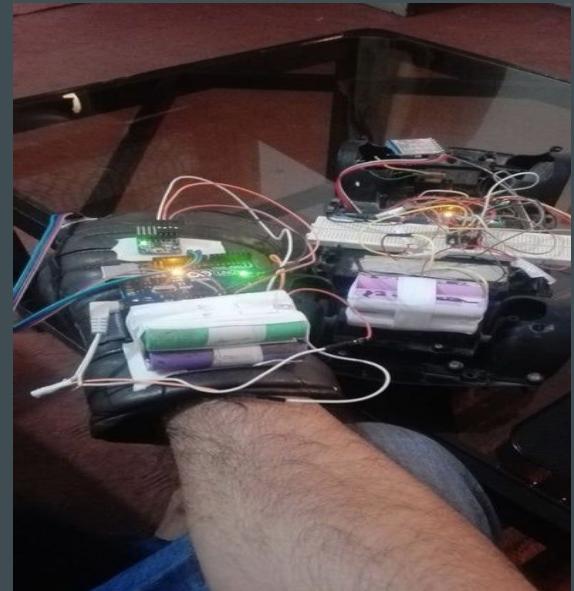
- A remote-controlled car that uses conventional buttons has been replaced with an innovative hand gesture-based control.
- The robotic car will work on four main functions, which are moving forward, reversing, moving left, and right
- This is achieved by creating an interaction between the Arduino microcontroller, accelerometer, bluetooth, and transmitter/receiver.



Modifications/Final Implementation

- Instead of using two wheels like the guidelines we used four wheels.
- We used 9V battery versus 6V battery(4 AA batteries)
- Wiring and coding for the car was changed to fit our modification of four wheels.
- Hardware remained the same i.e.: Gyroscope, arduino, chassis kit,HC-05 bluetooth module,L293D motor driver still used.

This image shows the original project that we modified.



Batteries Supplying Car

Only a certain brand of battery powered the car. The 9V battery was not strong enough.



Bluetooth Connection/Sync

Several attempts to pair the devices failed due to syncing issue. The device mistakenly paired with a nearby device.



Failures



Improper Connections/Soldering

Gyroscope did not respond. After troubleshooting techniques it was found that a bridge was soldered instead of each input being separated.



Incorrect Turning Directions

The guidelines followed for this project used a 2 wheeled car. Causing our code,wiring,etc to be completely different.

TroubleShooting

Several side projects were performed to test each aspect of the RC car that could be tainted.

Weak Battery



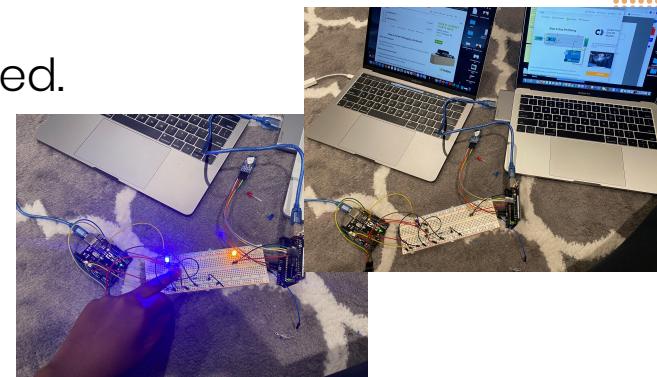
This video shows the car responding properly but it does not respond standing alone due to 9V not being enough to power the motors.

```
Serial HC-05
Module in HC-05 is ready
Make sure Both NL & CR are set
BTserial started at 38400
>AT
>AT
>AT
>AT +EIND
```

A screenshot of a terminal window showing AT-command output. The window has tabs for 'Autoscroll' and 'Show timestamp'. It displays the command 'Both NL & CR' and the baud rate '9600 baud'. The text area shows the serial port output: 'Serial HC-05', 'Module in HC-05 is ready', 'Make sure Both NL & CR are set', 'BTserial started at 38400', and several 'AT' commands followed by a '+EIND' response.

AT-Command Issues

Here is when a nearby device mistakenly paired with our project.



HC-05 Bluetooth Module

This side project connected and tested the sync of the modules by one LED synchronizing with the other.

Lessons Learned



HC-05

When pairing this device it is important to pair each device exactly how instructed or a small error can cause the pairing to fail.



The Brand of Batteries

Although the 9V battery moved the car it is ideal to use more than 9V to move a car. The provided battery in the arduino kit is very inadequate.



Do not test too late

Test each device as you go NOT after everything is constructed and “ready”.



Future Changes



HC-12 Bluetooth Module

Why?

It gives longer connection range. The pairing of the devices is way more user friendly.



L298N H-Bridge

Why?

Allows car motors to be connected with a secure connection. There is also more projects that use this device to connect motors to the arduino

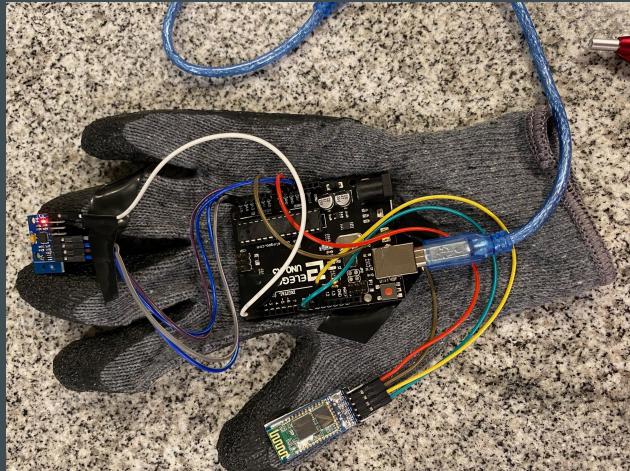
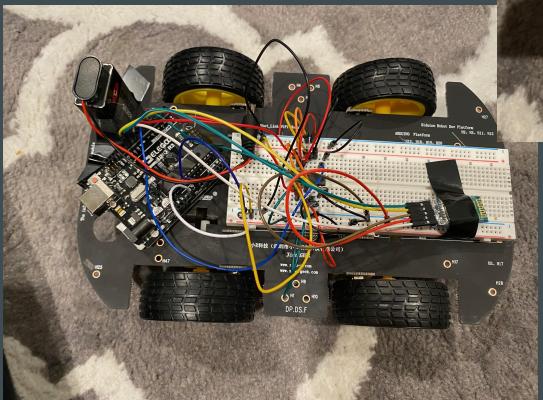
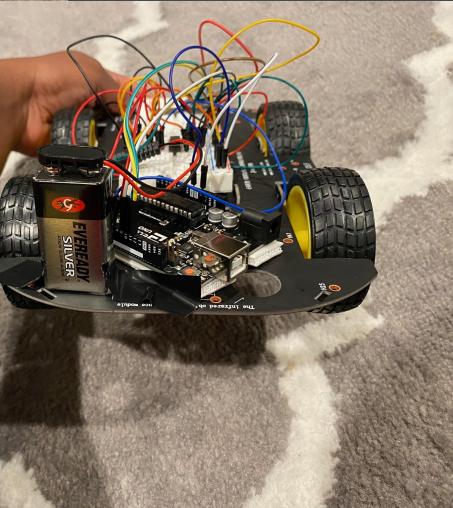
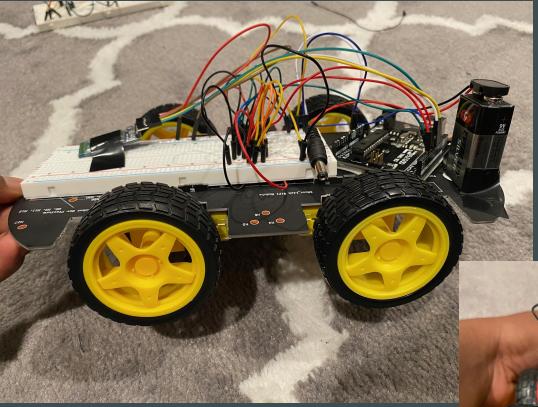


Stronger Battery

Why?

A stronger battery means a greater amount of motor power which results in a stronger car.

Our Robotic Car



DEMONSTRATION



Note*** 9V was not strong enough to move the car on the floor.