

# Hand Gestures Controlled Robot car and Arm

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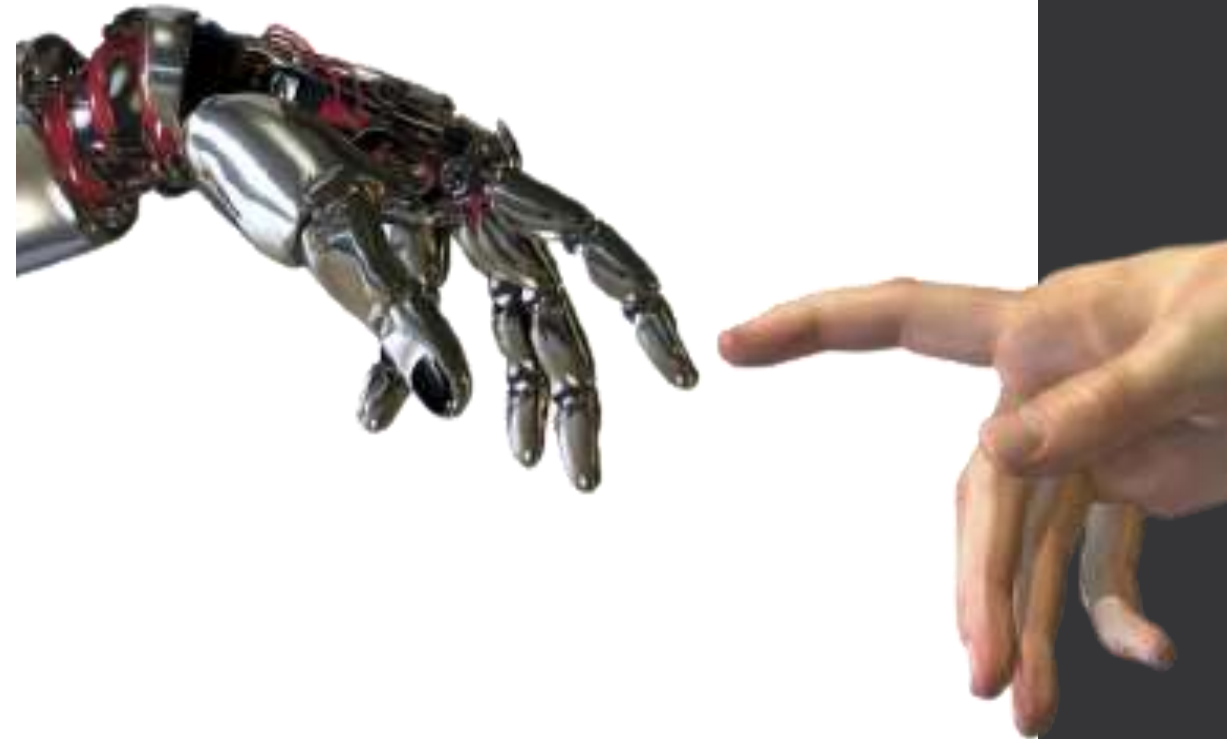
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# Outline :

- Introduction
- Motivation
- Features
- Hardware Tools
- How the project work ?
- Constraints
- Literature Review •
- Future work



# : Introduction

- Hand Gesture controlled robotics stands for using hand movement as input signals to control robot dynamics .
- To detect the hand movement , user have to wear gesture device attached to a glove which includes sensors that detect movements .
- The robot and gesture device are connected wirelessly .
- The sensors detects hand's movements and send command to the robot , which will result in the movement of car or arm in a specific direction .

# Motivation

Autonomous system could reach far and wide

Robots and robotics arm may work in a dangerous areas .

So , Its important to control robots and robotics arm remotely , to keep people away from these places or jobs or wars .

Gesture Control being a natural and easy way .

Automouns robots arm are using in industries to pick and hold something .

Very effective to help handicapped person .

# Features :

- Car movement controlled by hand gestures in all direction.
- Control the car's speed by finger movement .
- Arm movement Control in 4 direction .
- Open and close the gripper attached with the arm by finger to hold something.
- Barriers Avoidance

# Project Parts

The project divided into 2 mainly parts



Transmitter



Receiver



# Transmitter Part

The gesture device that is attached to the hand glove .

# Hardware Tools

## Transmitter Circuit :



Arduino Nano



Flex Sensor



Switch



MPU6050

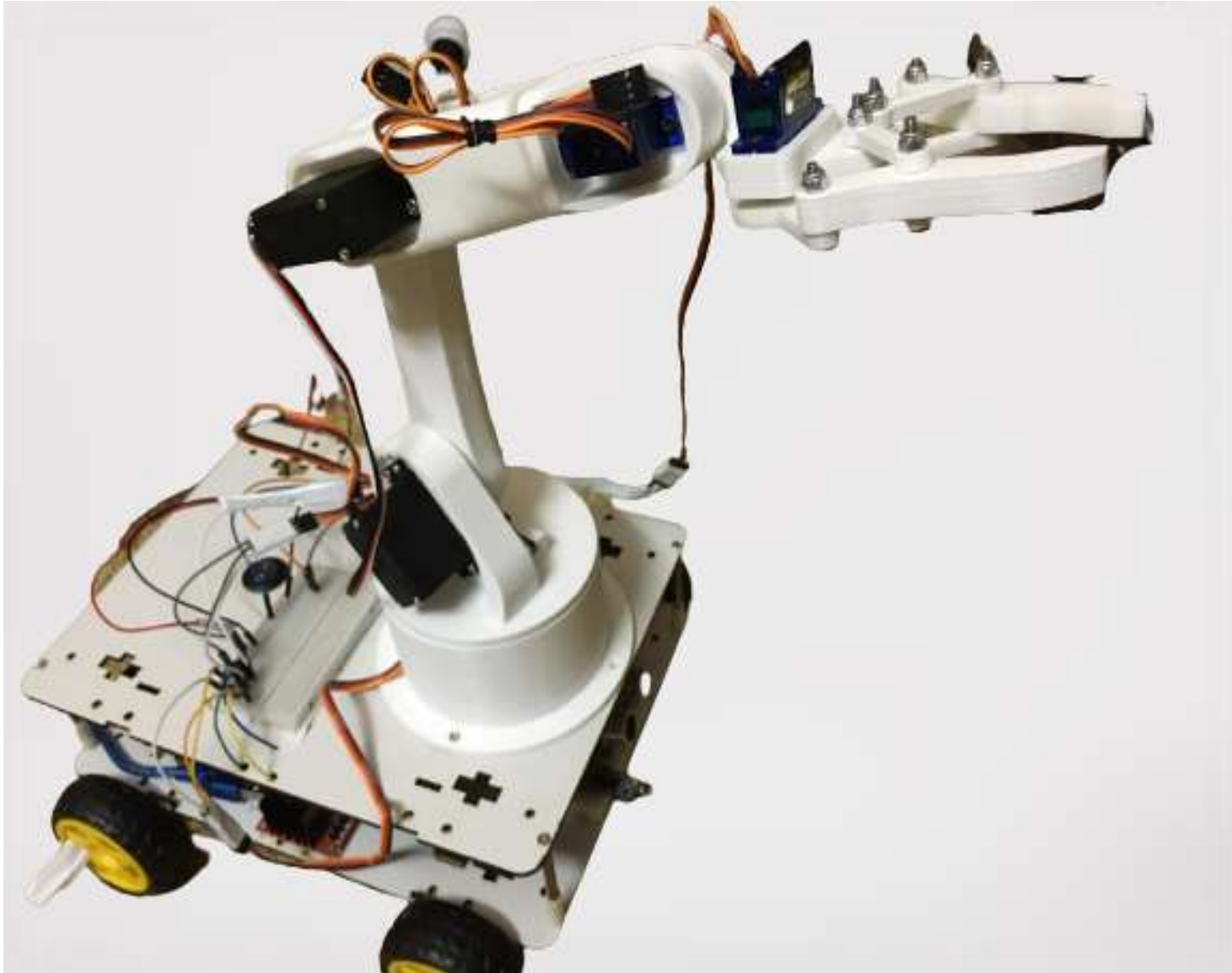


HC12



Resistor





## Receiver Part

Which is consist of car  
and robotic arm

# Hardware Tools

## Receiver Circuit:



Arduino Mega



Ultrasonic Sensor



H-Bridge



4wheels with DC motor



HC12 receiver



3.7\* 3battery

# Hardware Tools



3D printed Arm



\*6servo motors



Buck convertor

How the project  
works ?

## The transmitter part: •

Determine the hand gesture

```
graph TD; A[Determine the hand gesture] --> B[Get and process X, Y coordinates from the mpu6050 to the arduino]; B --> C[Read flex data and the switch state from arduino]; C --> D[Pass this data serialy to the HC12];
```

Get and process X ,Y coordinates from the mpu6050 to the arduino

Read flex data and the switch state from arduino

Pass this data serialy to the HC12

# The receiver part:•


Receive the data from HC12 transmitter part



Move it to the Arduino Mega and split it .

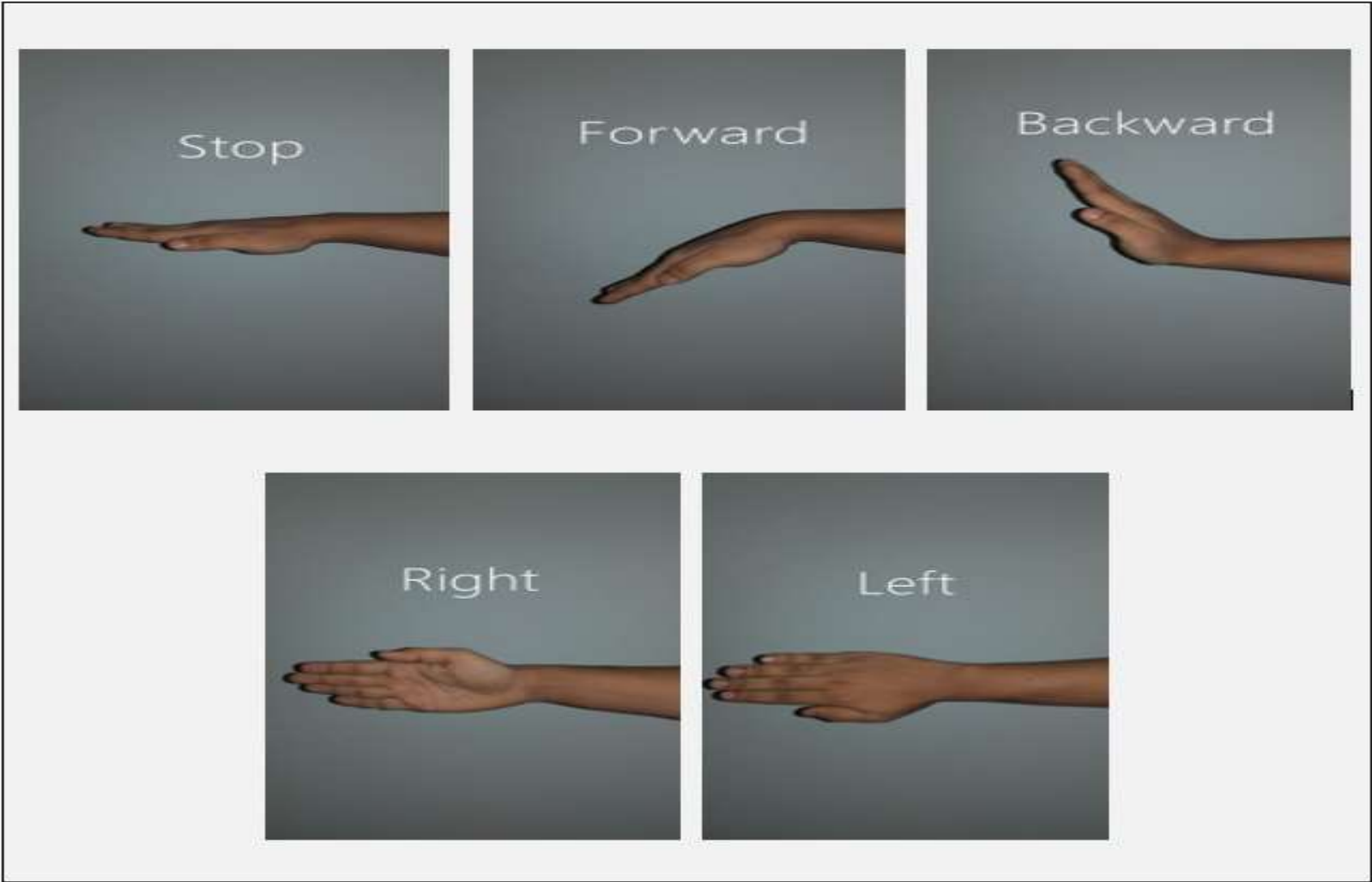


If the recived button state is 1 , then the recived data will be send to the servo motor to control robotic arm motion



If the recived button state is zero the recived data will be used to controll the H-bridge to control the direction and the speed of the car

# Hand Gestures



# Constraints

COVID-19

Shorting in battery  
voltage

lack of electronic parts



# Literature Review

Hand Gesture  
Recognition  
Based  
Wheelchair  
Direction  
Control Using  
Microcontroller

Design and  
Implementation  
of a Wireless  
Gesture  
Controlled  
Robotic Arm  
with Vision

# Future work



Android Mobile application



providing a camera placed on  
the car

# Conclusion

In this proposed work , wireless gesture control • robot and arm is successfully developed and implemented by using hand in place of any other methods like buttons or joystick . we only need to move our hand to control either the car or the robotic arm

Thank You