Ahsanullah University of Science & Technology
Department of Computer Science & Engineering

Gesture Recognition Robot

Microcontroller Based System Design(CSE 3216)

Submitted to:

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Overview:

In this microprocessor-based lab, our project is about a robot that can be controlled without a joystick. With our hand movement, we can control the robot.

It's easy to control a robot with a hand instead of a joystick. So, our primary purpose is to make that possible and make it able to detect hand movement with a different position. Our project has an accelerometer to detect hand movement as a sensor, and Arduino is used as the programming platform.

Instruments:

1. ADXL335 Accelerometer
2. Arduino Uno(Atmega32)
3. HT12E Encoder IC
4. HT12D Decoder IC
5. L293D Motor Driver IC
6. General-Purpose PCB
7. 12v/9v Geared Motor
8. 12/9v Power Supply
9. 7805 Voltage regulator
10. Robot Chassis (Optional)

Features:

Done:

With hand gestures, the robot can move,

- Forward
- Backward
- Right
- & can be stopped.

Undone:

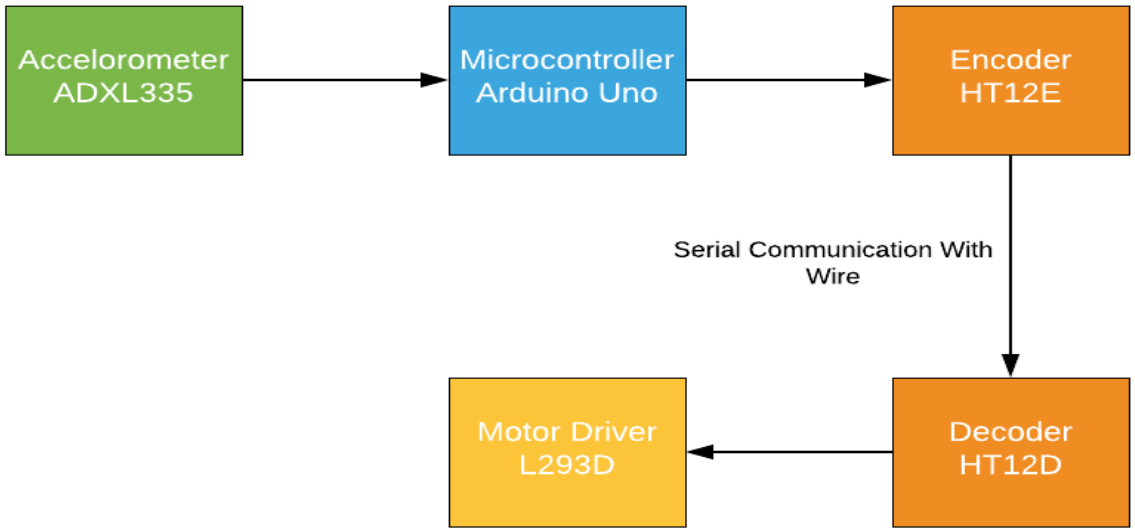
- Not wireless

Working Principle:

The brain of the robot is an Arduino Uno(Atmega32). It is controlled with code. The gestures made by a hand is recognized by the acceleration measuring device called accelerometer (ADXL335).

The Accelerometer reads the X Y Z coordinates when we make hand gestures. It then sends the X Y Z coordinates to the Arduino. We don't need the Z-axis. We need only X and Y. The Arduino checks the values of coordinates and sends 4bit data to the Encoder IC in accordance with the data received from the accelerometer. The Encoder passes the data to Decoder with the help of a serially connected wire. The 4bit data sent by the Encoder to the Decoder is decoded and passed to Motor Driver IC. Later the motor driver makes the decision to turn the two motors in the required direction.

Work Flow:



Circuit Diagram:

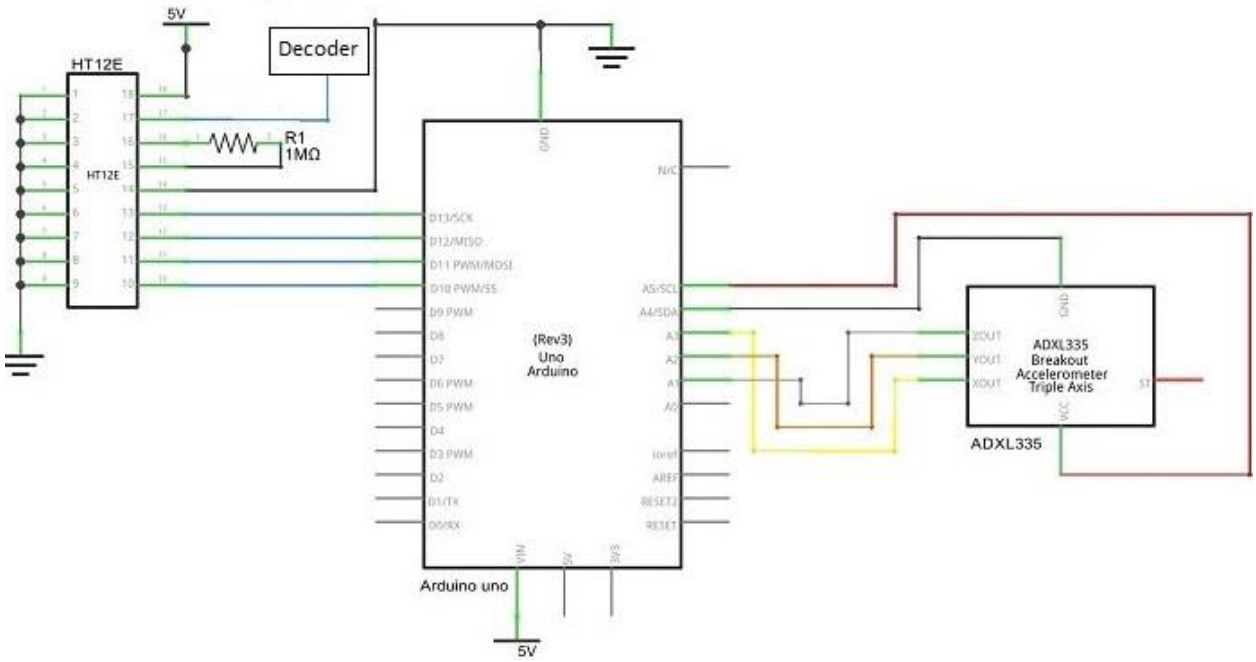


Figure 1: Transmitter Circuit

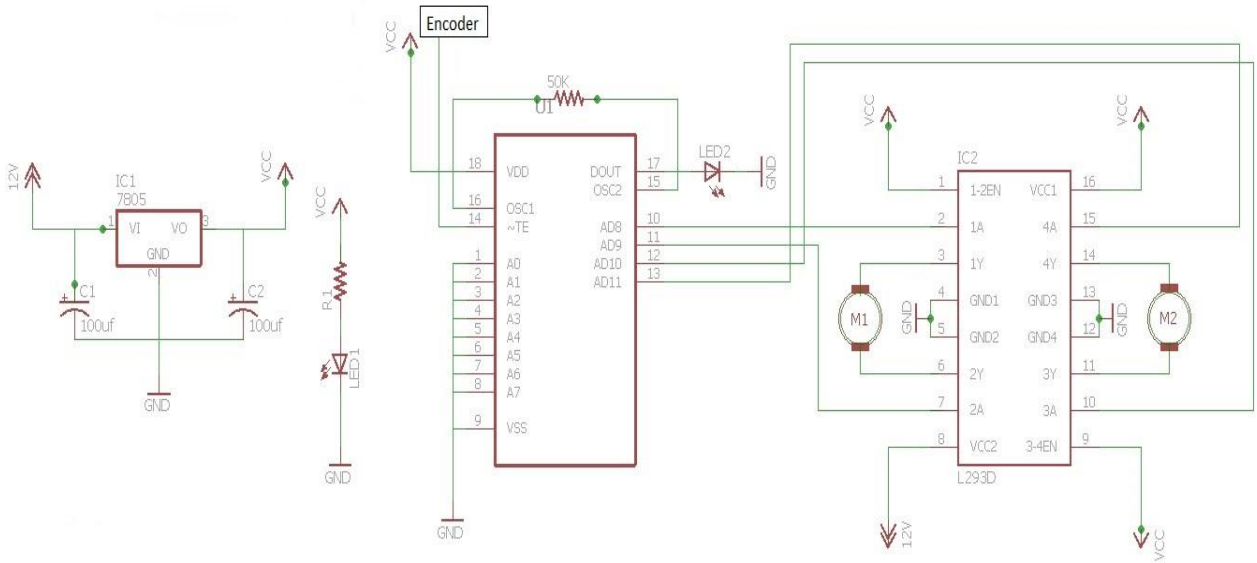


Figure 2: Receiver Circuit

Pictures:

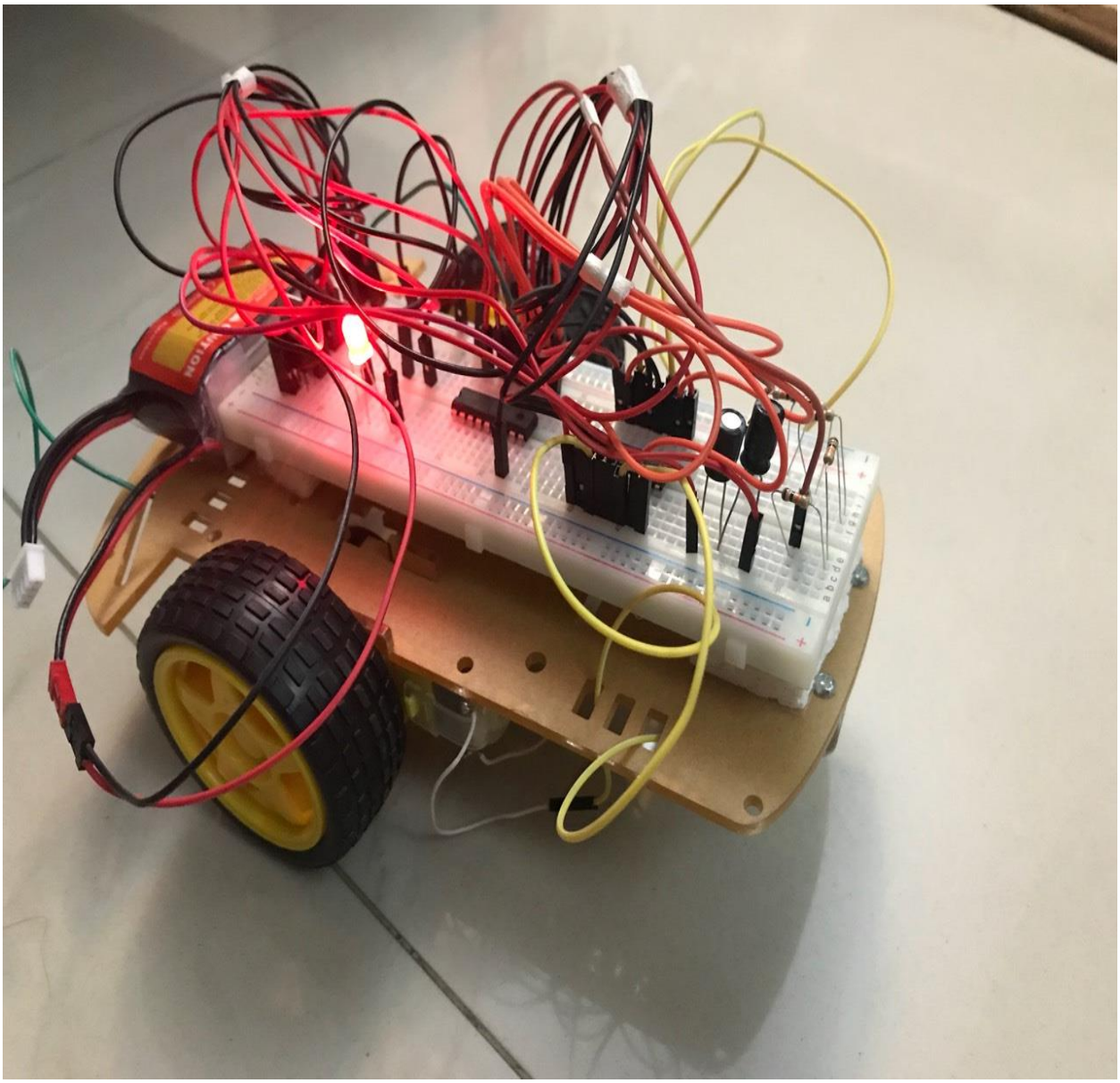


Figure 3: Receiver Robot

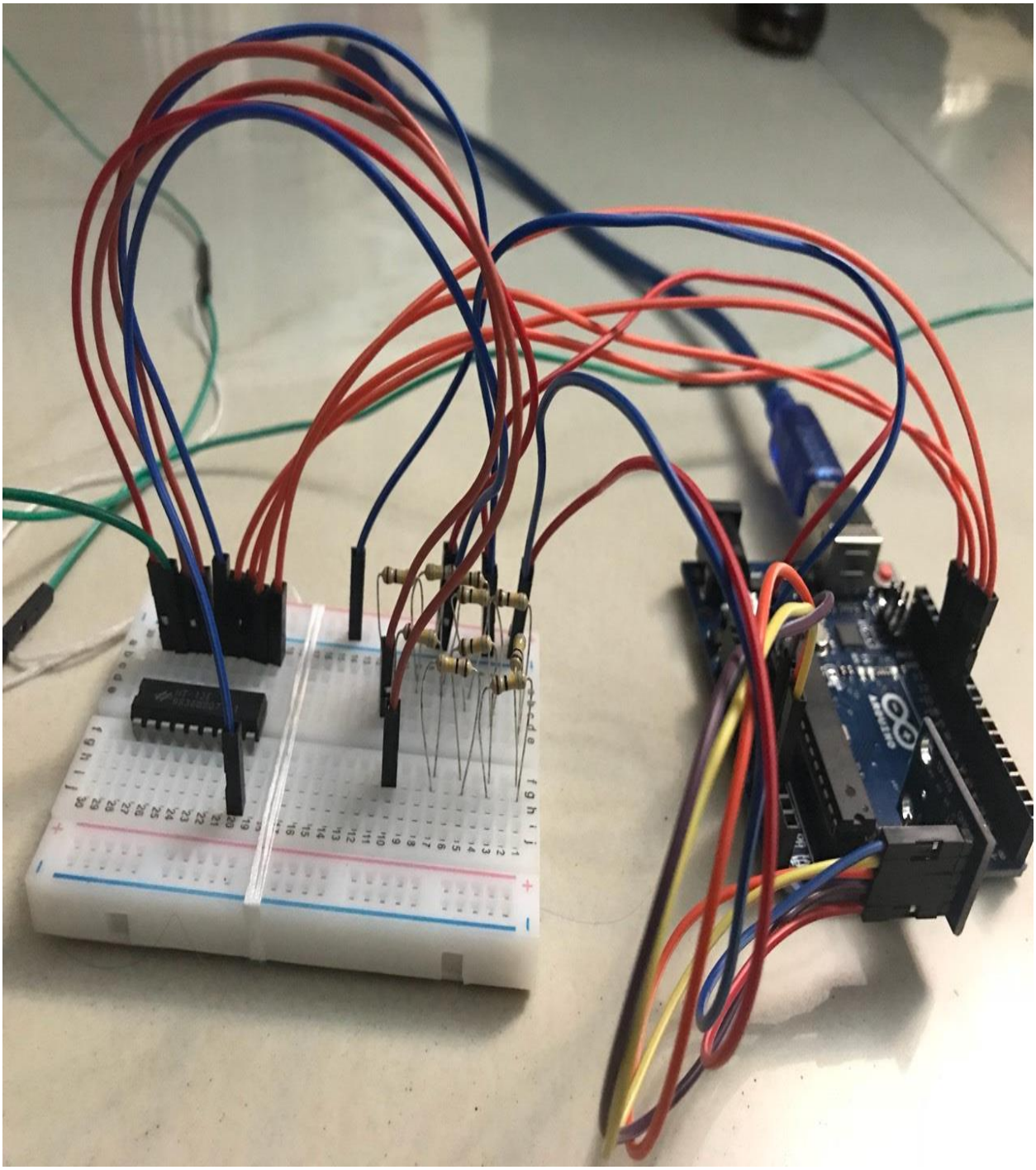


Figure 4: Transmit with Arduino

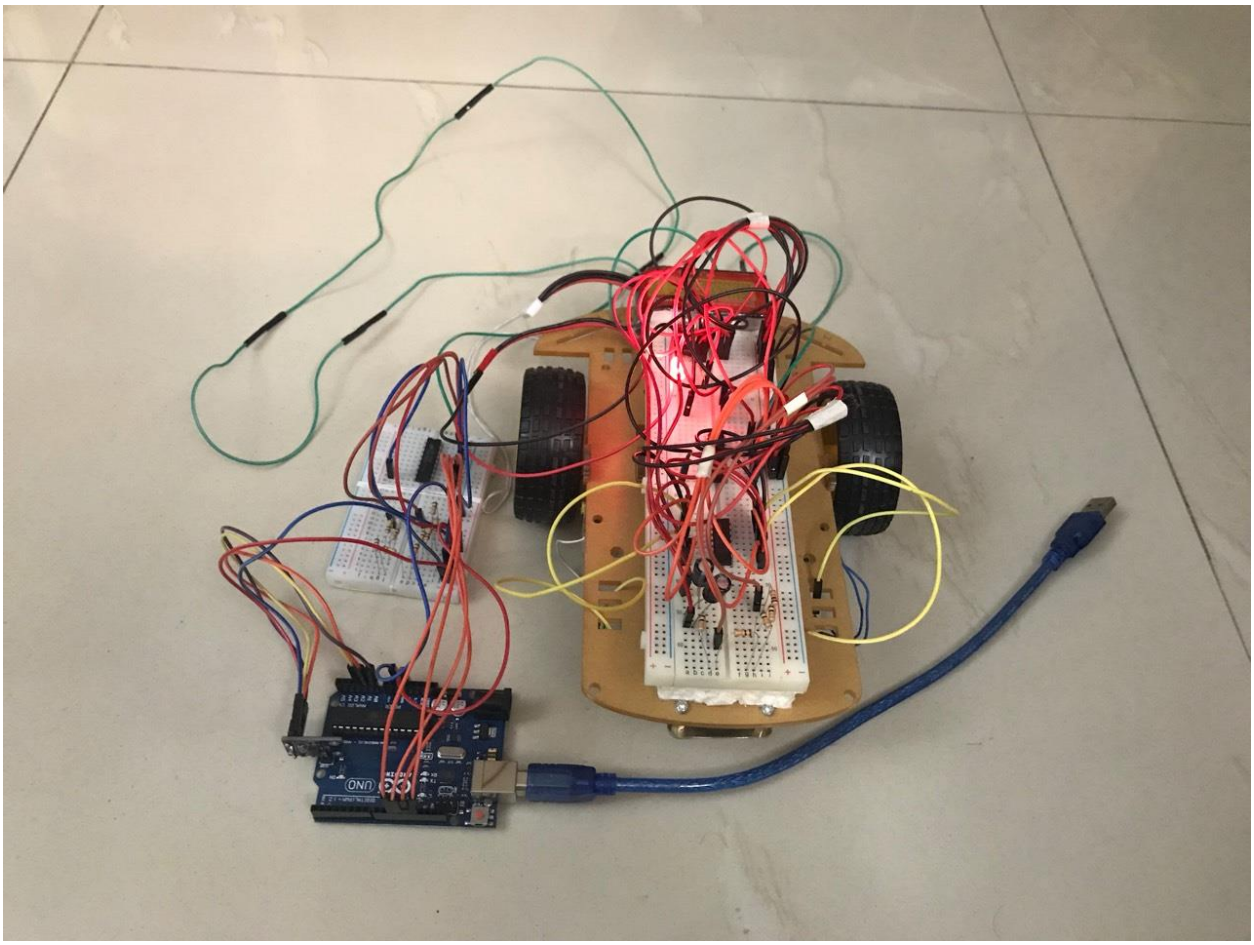


Figure 5: Full Project

Conclusion:

Our project is not wireless. So, our main future plan is to make it wireless using a transmitter and receiver module.

In the future, we are planning to use a video camera which will be placed in front of the robot to capture videos.