ECE4002

ADVANCED MICROCONTROLLERS

PROJECT REPORT

TITLE: GESTURE BASED HOME AUTOMATION SYSTEM

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ABSTRACT

Nowadays we use Infrared Remote for controlling the home appliances. Primary motive of proposing the new system of hand gesture remote control is to remove the need to look in to the handheld remote and to search for a specific key for specific function. This project presents a novel system to control home appliances through hand gesture as a remote-control device. Home automation is the use and control of home appliances remotely or automatically. Day by day the gap between machines and humans is being reduced. Nowadays hand gesture based home automation is getting more importance. Gesture recognition refers to recognising the motion of the human parts like hand, face, etc. Most of the electronic components manufactures focuses on the hand gesture basis.

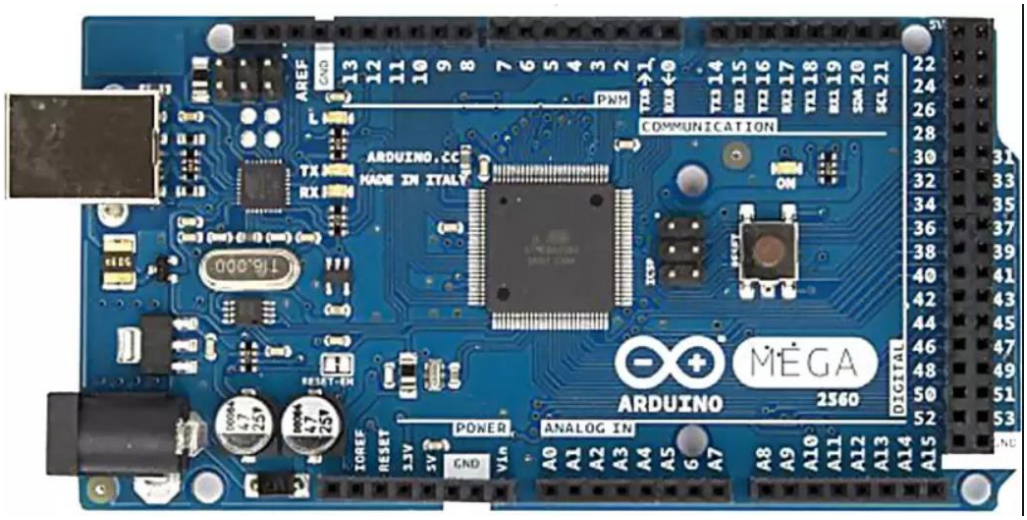
INTRODUCTION

In this proposed work we have implemented the gesture-controlled home automation using Arduino Mega. Taking in concern the day to day challenges in the world with growing technologies in normal life, the following proposed work was created. The problem of disability is gaining more and more importance all over the world. Therefore, providing solution for the inabilities is the prime moto of this work. Gesture plays a major role in this proposed work. A gesture is a form of non-vocal communication in that human body actions can be able to communicate the particular speech or communication or even messages. Gestures include movement of the hands, face, or other parts of the body. Gestures allow individuals to communicate a variety of feelings and thoughts, from contempt and hostility to approval and affection. There are other applications which could be controlled by a gesture include media players, remote controllers, robots, etc. Gesture recognition is the mathematical interpretation of a human motion by a computing device. In other words, interface with computers or other equipment

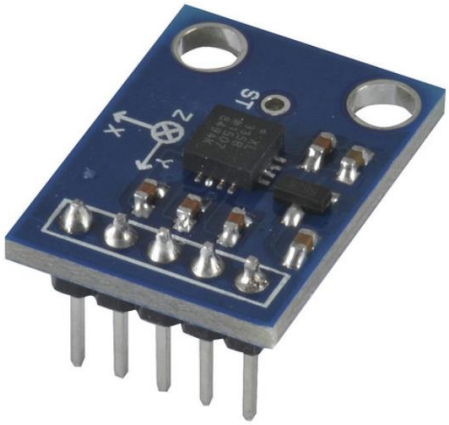
using gestures of the human body, typically hand movements. In the gesture recognition technology, the accelerometer reads the movements of the human body in x, y and z coordinates and communicates the data to a computer that uses the gestures as an input to control devices or applications. Once the first gesture is captured and processed, one appliance is controlled.

SPECIFICATIONS

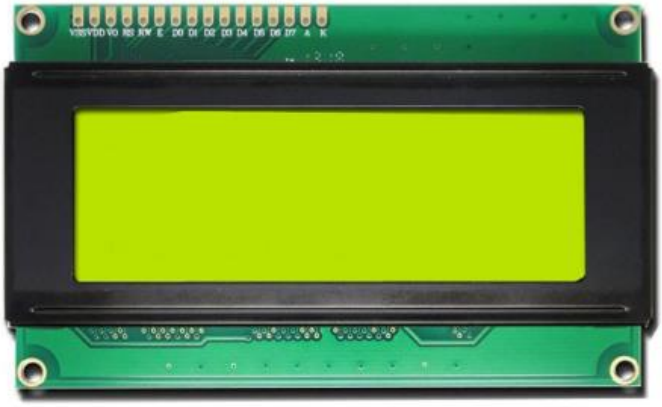
1. **Arduino Mega**



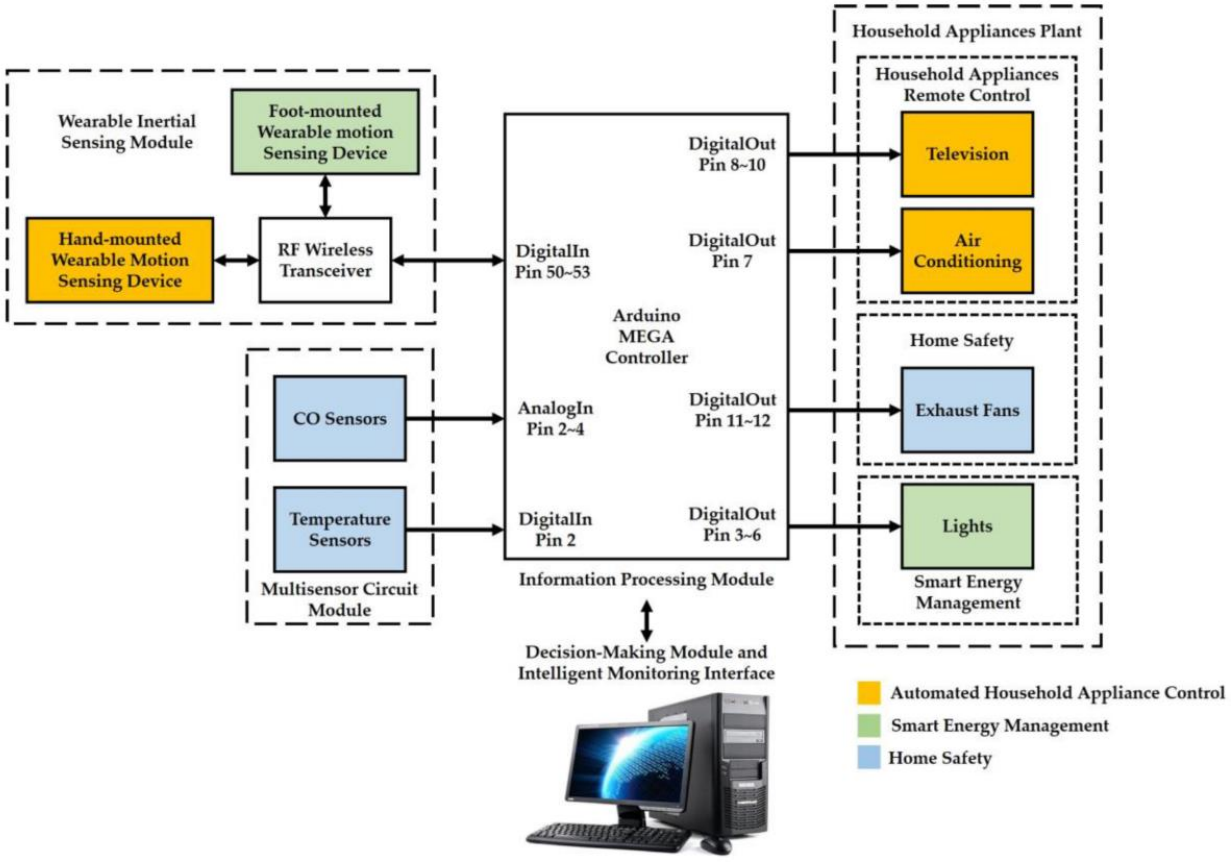
2. **3 – Axis Accelerometer**

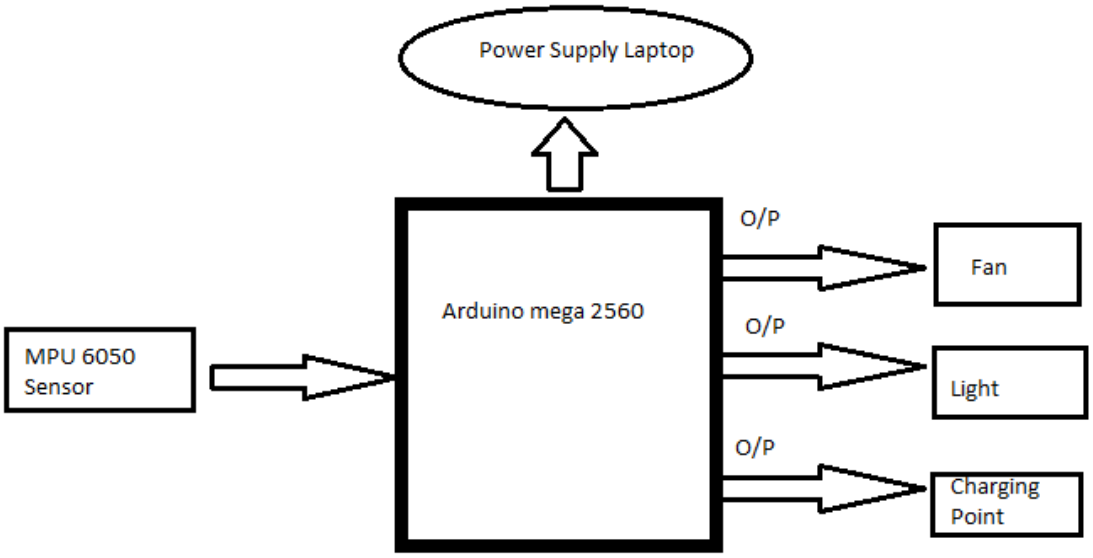


3. LCD Display



BLOCK DIAGRAM





WORKING

A 3D gesture recognition algorithm has been developed in this study to deal with hand gesture motion signals measured by the wearable motion sensing device mounted on residents' wrists for implementing the automated household appliance control function. Residents can utilize the wearable motion sensing device to make hand gestures at their preferred speed without any space limitations for generating the adequate decision commands to remotely control the household appliances. The proposed 3D gesture recognition algorithm is composed of the procedures of:

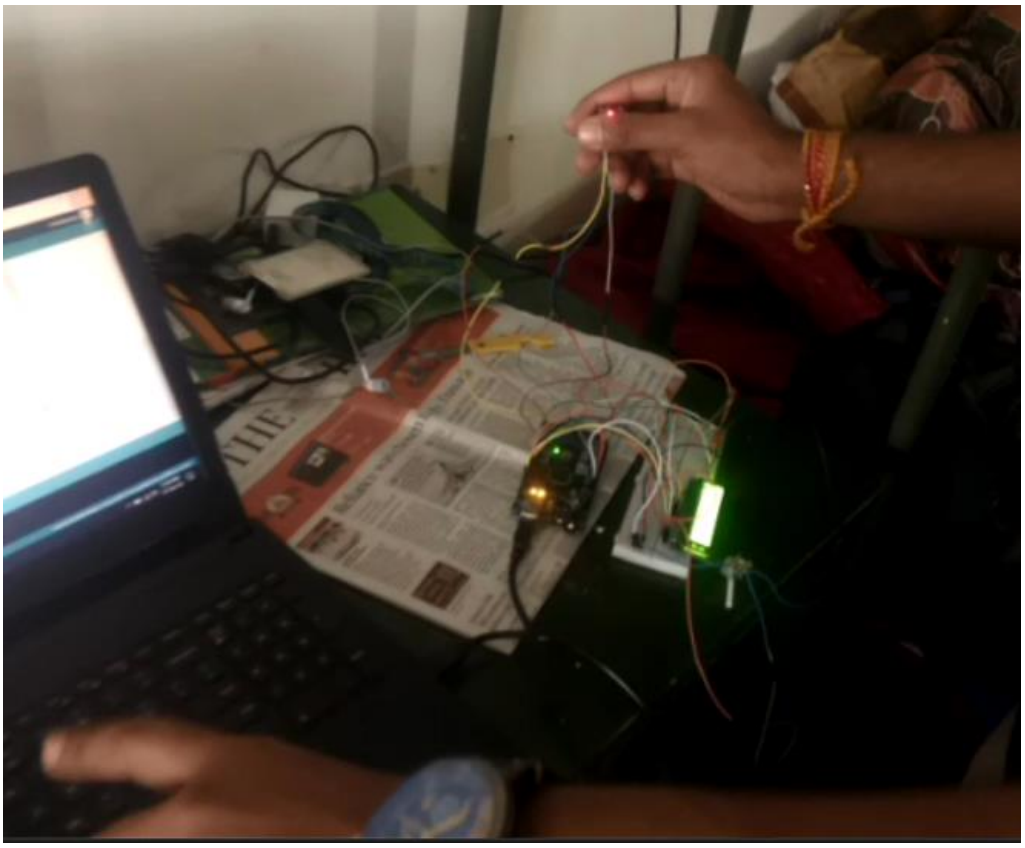
(1) inertial signal acquisition

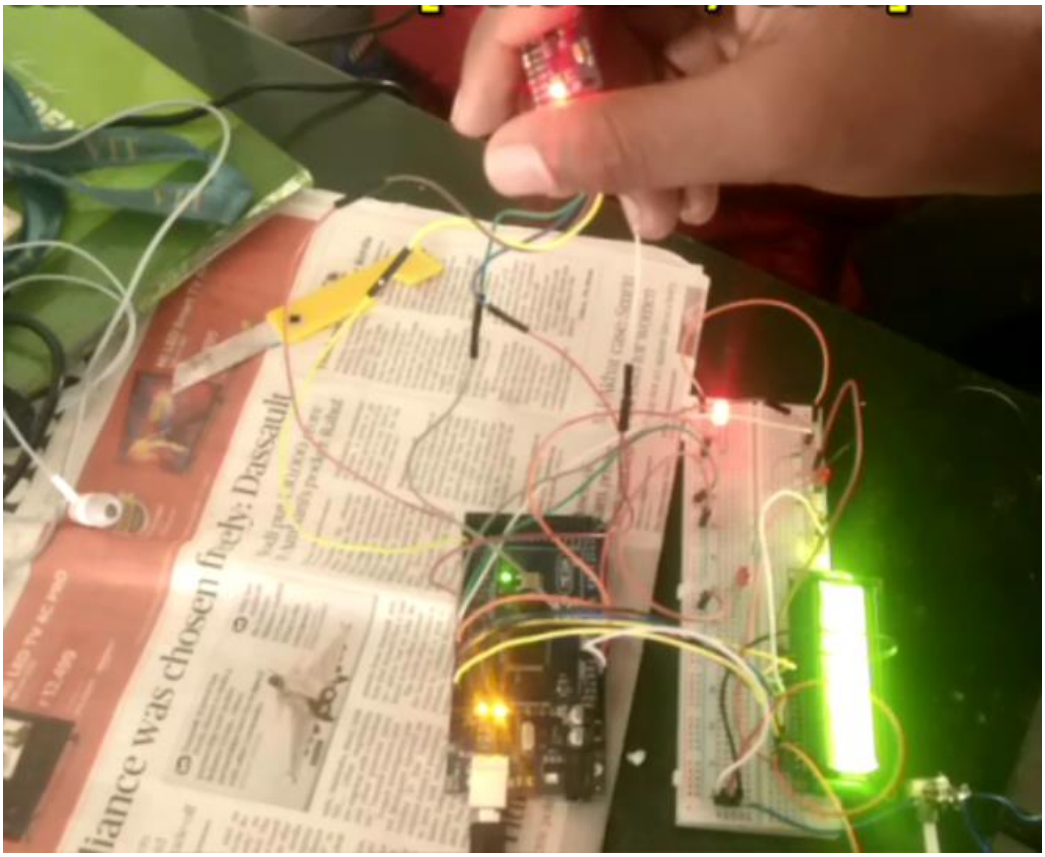
(2) signal preprocessing

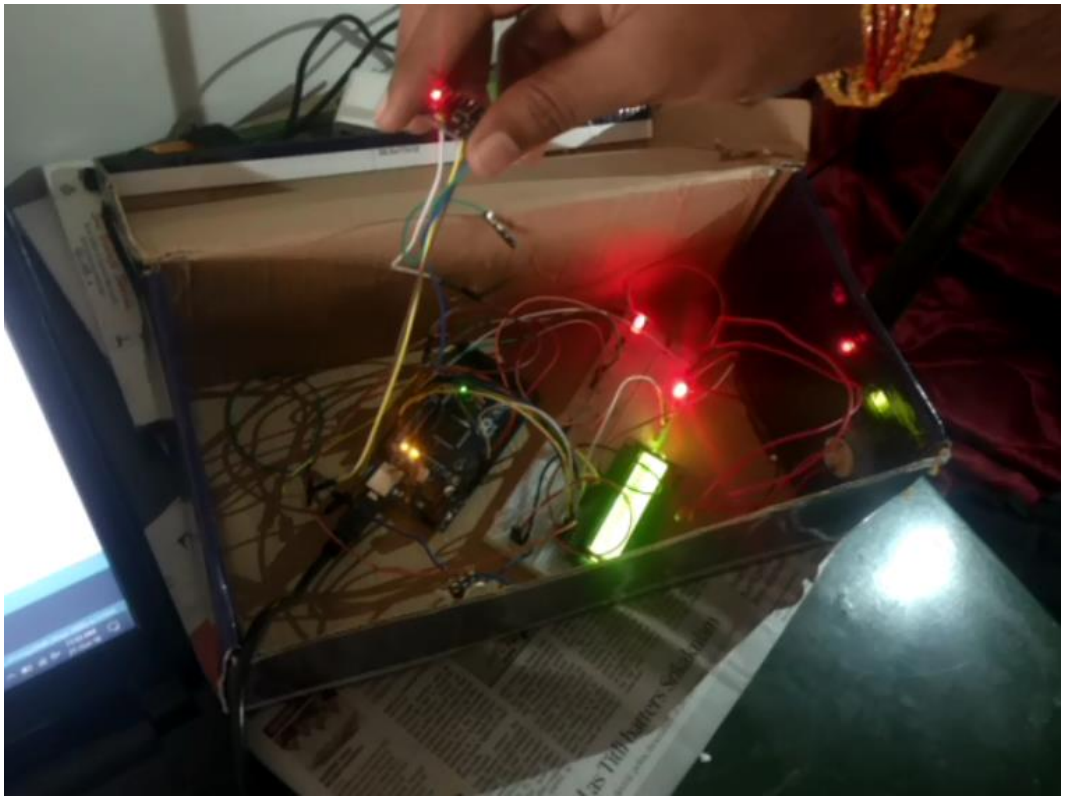
(3) feature extraction and normalization

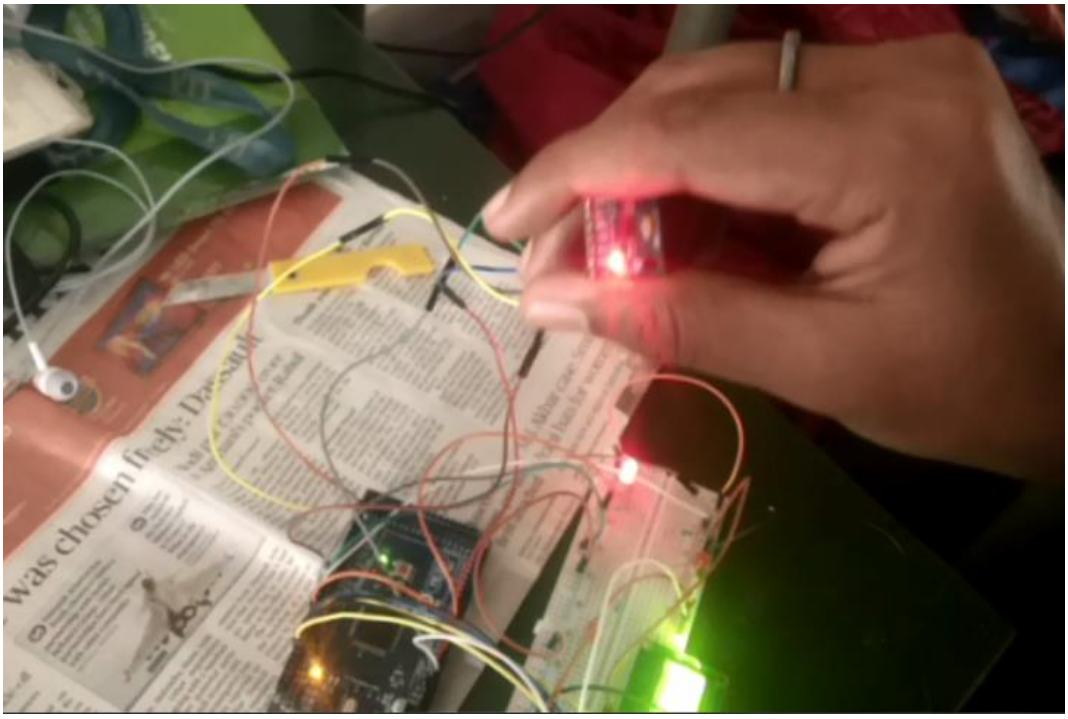
(4) gesture recognition.

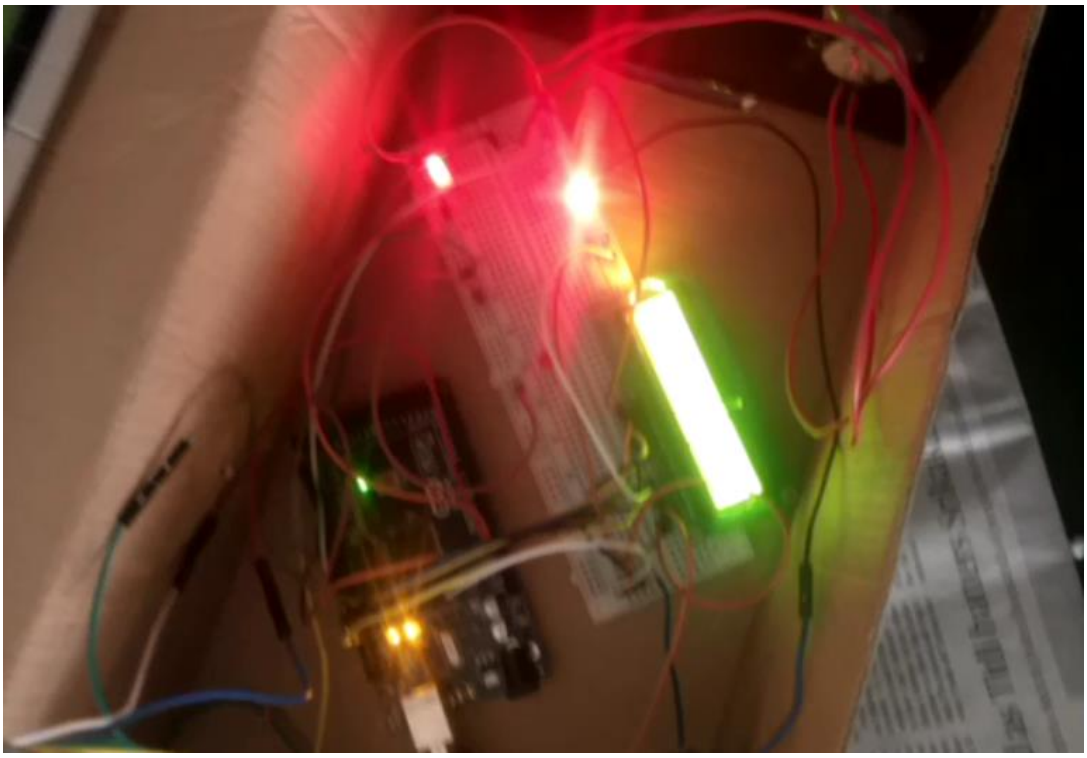
DEMO

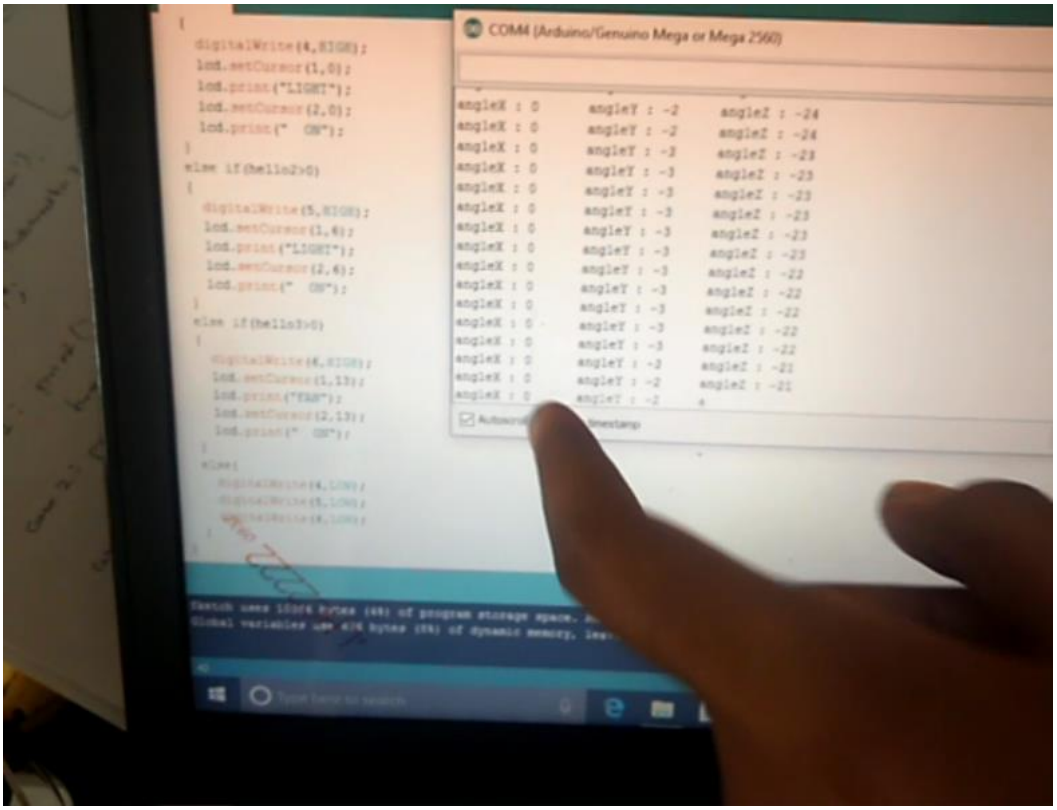











COM4 (Arduino/Genuino Mega or Mega 2560)
digitalWrite(4,HIGH);
lcd.setCursor(1,0);
lcd.print("LIGHT");
lcd.setCursor(2,0);
lcd.print(" ON");
else if(hello2>0)
digitalWrite(5,HIGH);
lcd.setCursor(1,6);
lcd.print("LIGHT");
lcd.setCursor(2,6);
lcd.print(" ON");
else if(hello3>0)
lcd.setCursor(1,13);
lcd.print("FAN");
lcd.setCursor(2,13);
lcd.print(" ON");
else{
angleX : 0 angleY : -2 angleZ : -24
angleX : 0 angleY : -2 angleZ : -24
angleX : 0 angleY : -3 angleZ : -23
angleX : 0 angleY : -3 angleZ : -23
angleX : 0 angleY : -3 angleZ : -23
angleX : 0 angleY : -3 angleZ : -23
angleX : 0 angleY : -3 angleZ : -23
angleX : 0 angleY : -3 angleZ : -23
angleX : 0 angleY : -3 angleZ : -22
angleX : 0 angleY : -3 angleZ : -22
angleX : 0 angleY : -3 angleZ : -22
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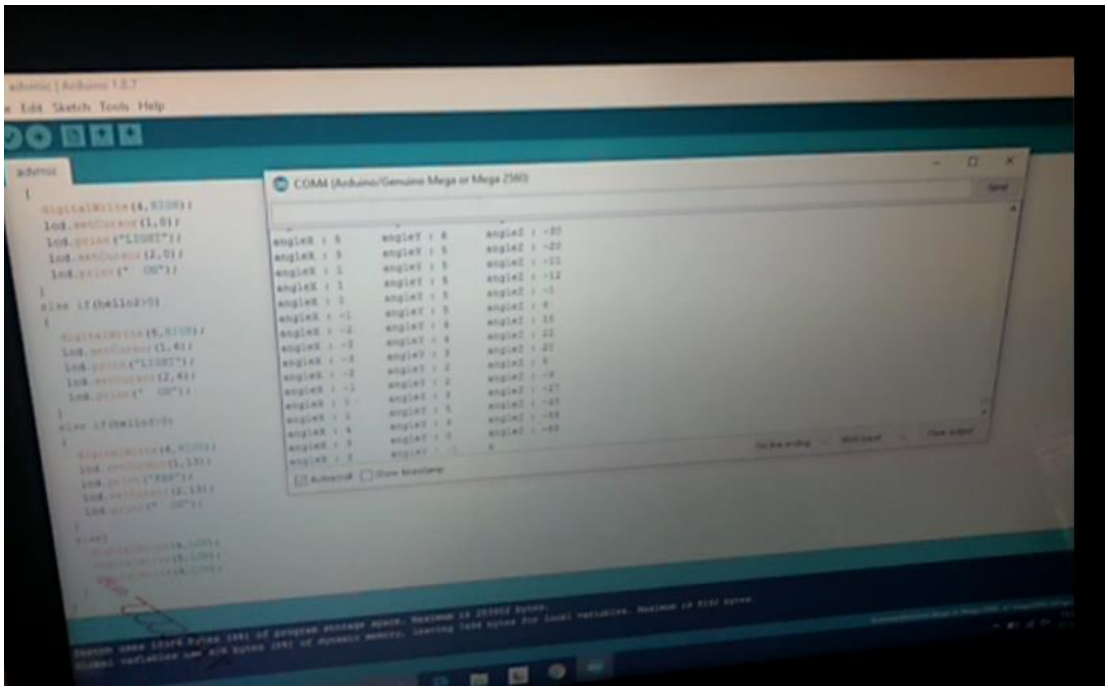
angleX : 0 angleY : -2 angleZ : -21
Autoscroll
Timestamp


File Edit Sketch Tools Help
COM4 (Arduino/Genuino Mega or Mega 2560)

ADVANTAGES OF USING GESTURE BASED HOME AUTOMATION

- It is a user-friendly system.
- Have ability to interact with the basic human needs through hand gesture.
- It proposes a possible solution to control the gadgets for physically challenged and blind people.
- Hand Gesture Based Remote is a device to replace all other remotes used in households and perform all their functions.

FUTURE WORK

We will try to bring more advancement in the system like interfacing multiple gyroscopes to connect multiple appliances. We can also set a limited number of devices out of all the devices in the system, that can work simultaneously, to avoid power loss. Suppose, if the limit exceeds, an alarm will be ringed, indicating the load on the system.

REFERNCES

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