

Introduction

Have you ever been irritated of searching the missing remote of your home appliance? If so, we have attempted to solve your problem. We have introduced a "Gesture Controlled Remote" which can be used to change the television channel and volume or change temperature settings by one unit along with the power on-off facility. For controlling your devices like AC and TV, you don't have to worry about where the remote is once you wear a glove and perform well defined easy gestures.

Idea

A 3-axis accelerometer records inputs measured by the virtue of hand movements. The 3-axis accelerometer essentially measures the static acceleration of gravity in tilt sensing applications, as well as dynamic acceleration resulting from motion or shock. According to well defined gestures, specific IR signals for specific protocols are sent to the Arduino.

The Arduino UNO receives IR signals using an IR receiver, a TSOP(1738) sensor and transmits the same using an IR transmitter LED. It is then received by the receiver in the television or air conditioner. One will be able to learn the codes from a conventional remote of a device of one's choice, provided it has a microcontroller of its own, and then use hand gestures to use the device.

Components Used

- Arduino-UNO
- ADXL 345 Accelerometer
- IR Receiver - TSOP 1738
- IR Transmitter Led
- Switches, LEDs and resistors

Team

- Ankit V. Patil.
- Sukhada S. Bakare
- Shubham R. Patil.

Mentor

- Samrudh Kelkar

Description

- Week 1 (May18th - May 24th)

Planned:

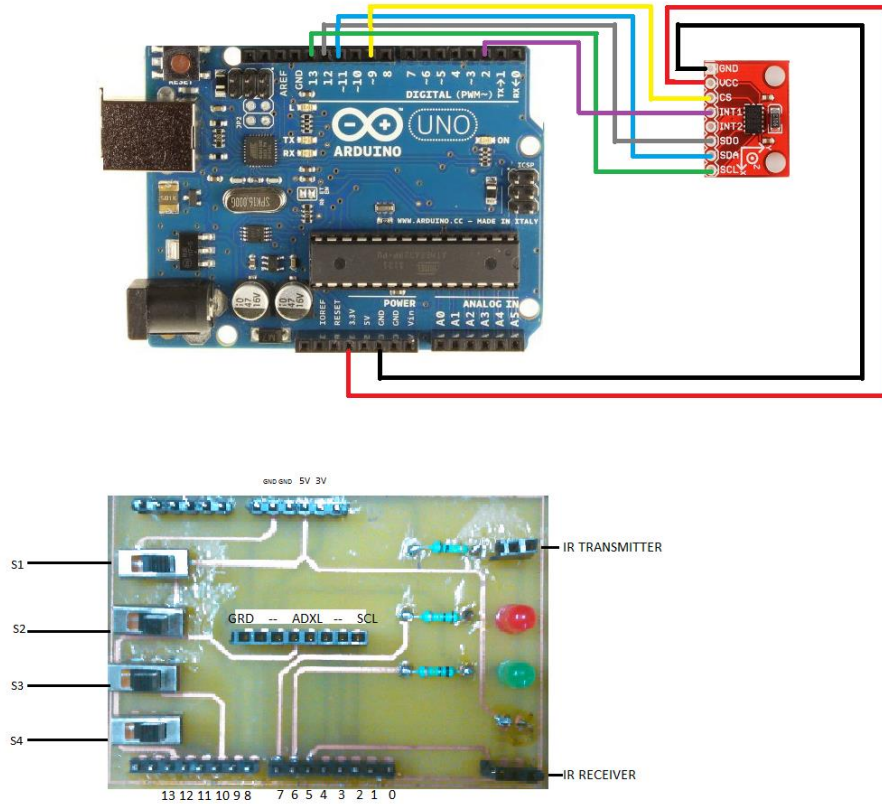
- To learn Arduino Coding and explore its various applications.
- To discuss with mentor the possible approaches and the problems that may arise.

Accomplished:

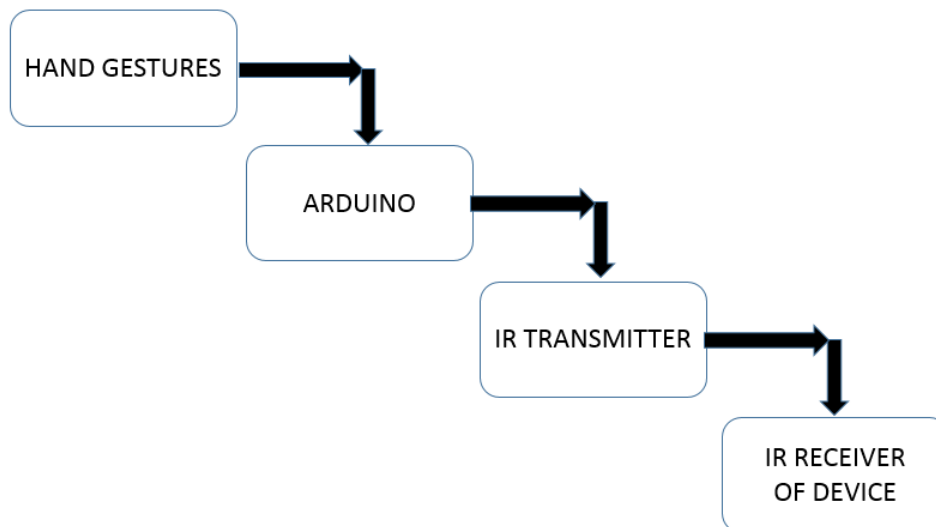
- Learnt basic Arduino Coding and tried examples practically with the help of breadboard.
- Discussed with mentor, the pros and cons of using Android App to build a remote.

- Replaced usage of Android app to hand gesture using 3-axis accelerometer and gyroscope.
- **Week 2 (May 25th - May 31st)**
 - Planned:
 - To search for different series of sensors to check IR signals.
 - To list different signals and protocols used in the TV remote.
 - Accomplished:
 - Found TSOP sensors to receive signals from a remote and studied the datasheet.
 - Enlisted the signals of various protocols in hex format.
- **Week 3 (June 1st - June 7th)**
 - Planned:
 - To send signals via laptop to the Arduino.
 - To search for accelerometer and gyroscope sensors.
 - Accomplished:
 - Coded to input a particular signal and record it in Arduino UNO.
 - Coded to send a recorded signal to the receiver via Arduino UNO.
- **Week 4 (June 8th - June 14th)**
 - Planned:
 - To debug code written to send signals.
 - To search for accelerometer and gyroscope sensors.
 - To code for detection of basic gestures.
 - Accomplished:
 - Finally able to send signals with laptop buttons as input to the Arduino.
 - Decided to use only a 3-axis accelerometer (ADXL345) to sense motion of hands.
 - Studied the working of ADXL345 to identify gestures.
- **Week 5 (June 15th - June 21st)**
 - Planned:
 - To analyze and detect different movements of the hand.
 - To replace the laptop input with hand gestures.
 - Accomplished:
 - Analyzed and detected gestures with the help of Microsoft Excel and graphical representation considering a number of users.
 - Merged the IR code with the gesture detection code.
- **Week 6 (June 22nd - June 28th)**
 - Planned:
 - To debug and finalize code.
 - To design PCB including Accelerometer, Arduino UNO, IR Rx and Tx, switches and LEDs.
 - Accomplished:
 - Finalized the code and debugged it.
 - Designed PCB and ready to attach with the Arduino UNO .
 - Final product is ready .

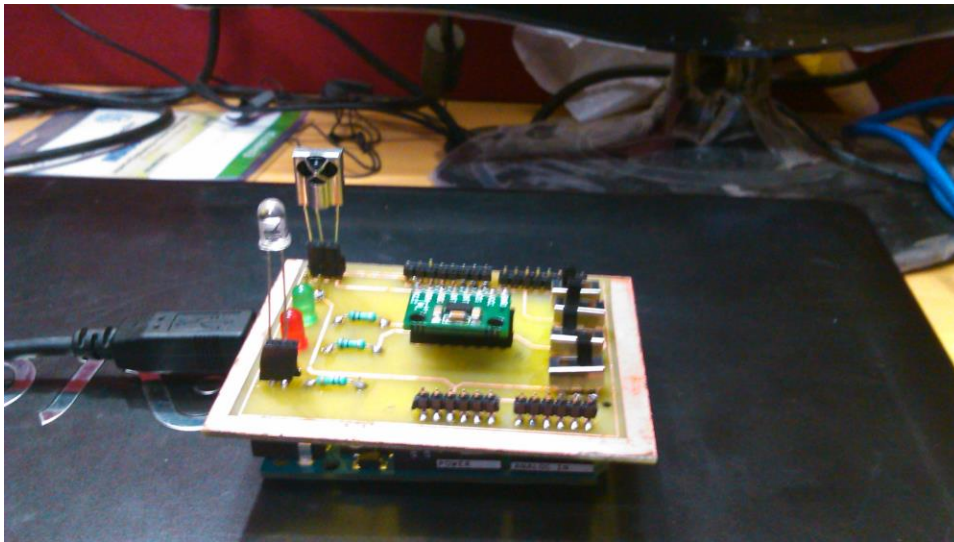
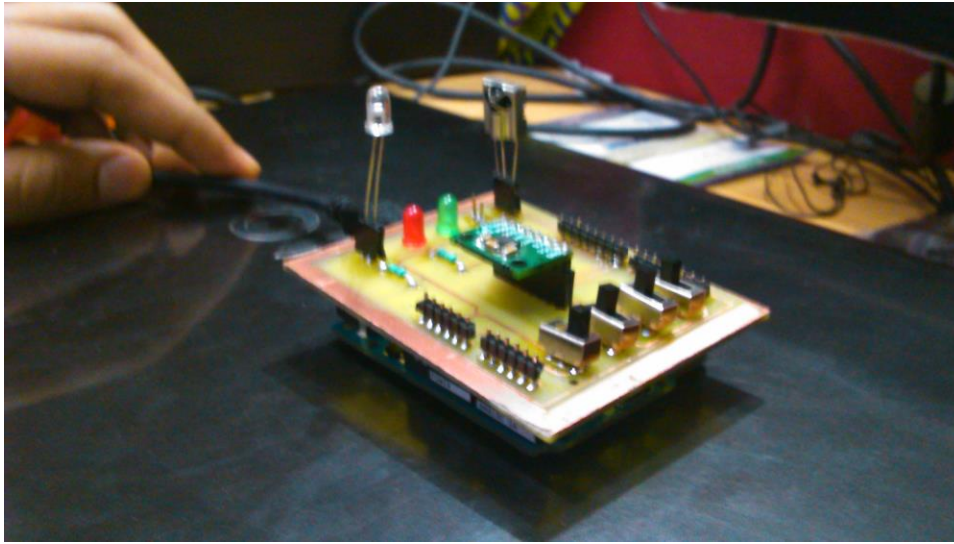
CIRCUIT DIAGRAM -

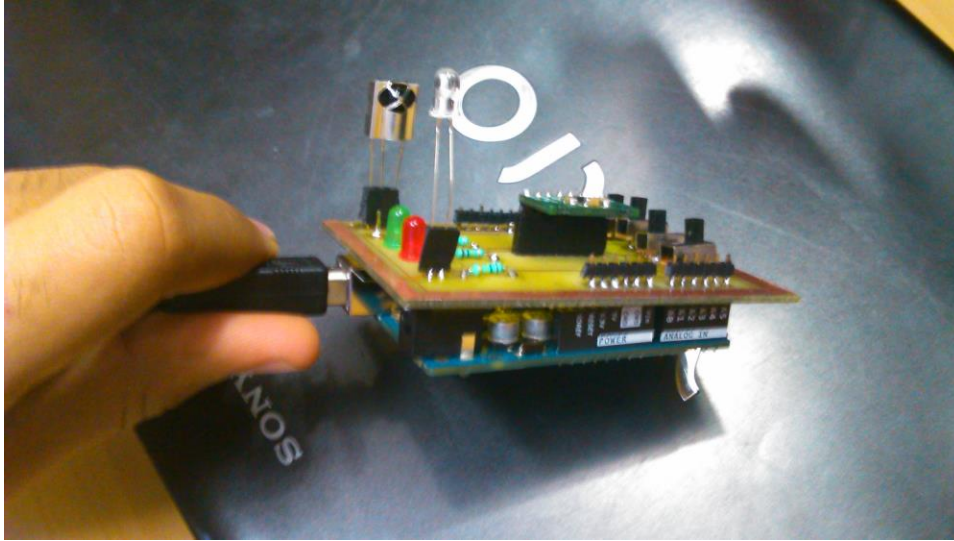


BLOCK DIAGRAM -



Final Product -





References -

- <http://arduino.cc>
- <https://www.sparkfun.com/tutorials/240>
- [http://www.geeetech.com/wiki/index.php/ADXL345 Triple Axis Accelerometer Breakout](http://www.geeetech.com/wiki/index.php/ADXL345_Triple_Axis_Accelerometer_Breakout)
- <https://github.com>