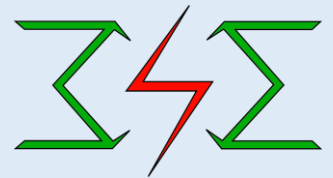# PERIPHERAL & INTERFACING LABORATORY

# Smart Room

## An approach to automation

CSE 3204

## Team members

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# Abstract:

The proposed and prototyped Smart Room System (SRS) is a low cost and wireless remote control system. This system is designed to assist and provide support in order to fulfill the needs of elderly and disabled in home. Also, the smart home concept in the system improves the standard living at home. The control system used here implements wireless Bluetooth technology to provide remote access from android phone. The full design remains the existing electrical switches and provides more safety control on the switches with low voltage activating method. The system intended to control electrical appliances and devices in house with relatively low cost design, user-friendly interface and ease of installation and as far automatic as possible.
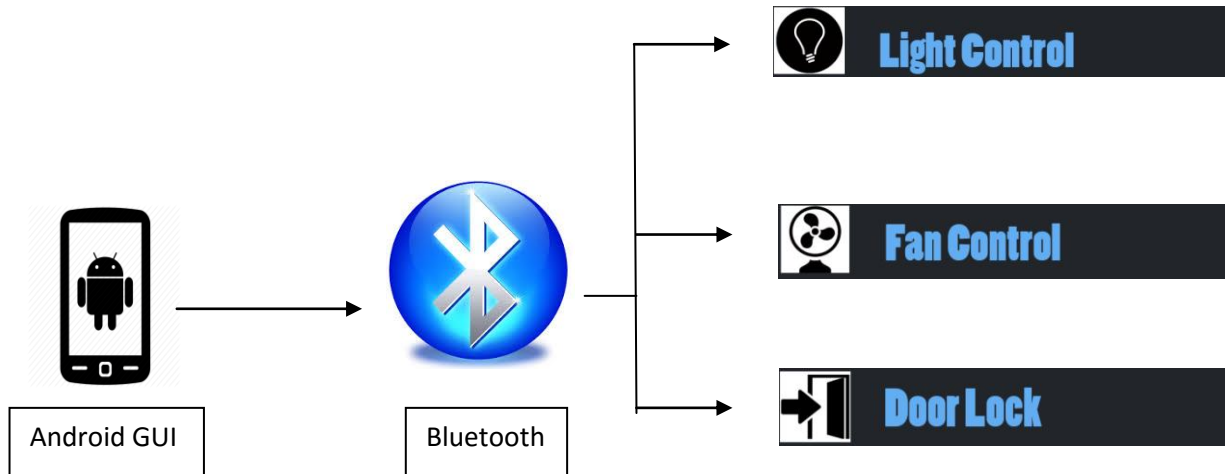
# System Overview



**Fig 1: Functional Block Diagram for SHS.**

The system is illustrated in figure 1. It describes that the home compliance like light, fan, heater etc. can easily be controlled by a smart phone app. The app communicates with those electrical devices via a Bluetooth module (hence for demonstration). The door can also be closed and open through this process. The another feature of this system is the outer light used in houses are set automatic response to light. When enough light is available they are turned off and will be turned on automatically when it is dark or may be controlled by the app.

# Hardware Requirements:

For the prototype we used;

1. Arduino Uno
2. HC 05 Bluetooth module
3. L293D
4. LEDs
5. Servo Motor
6. Connecting wires
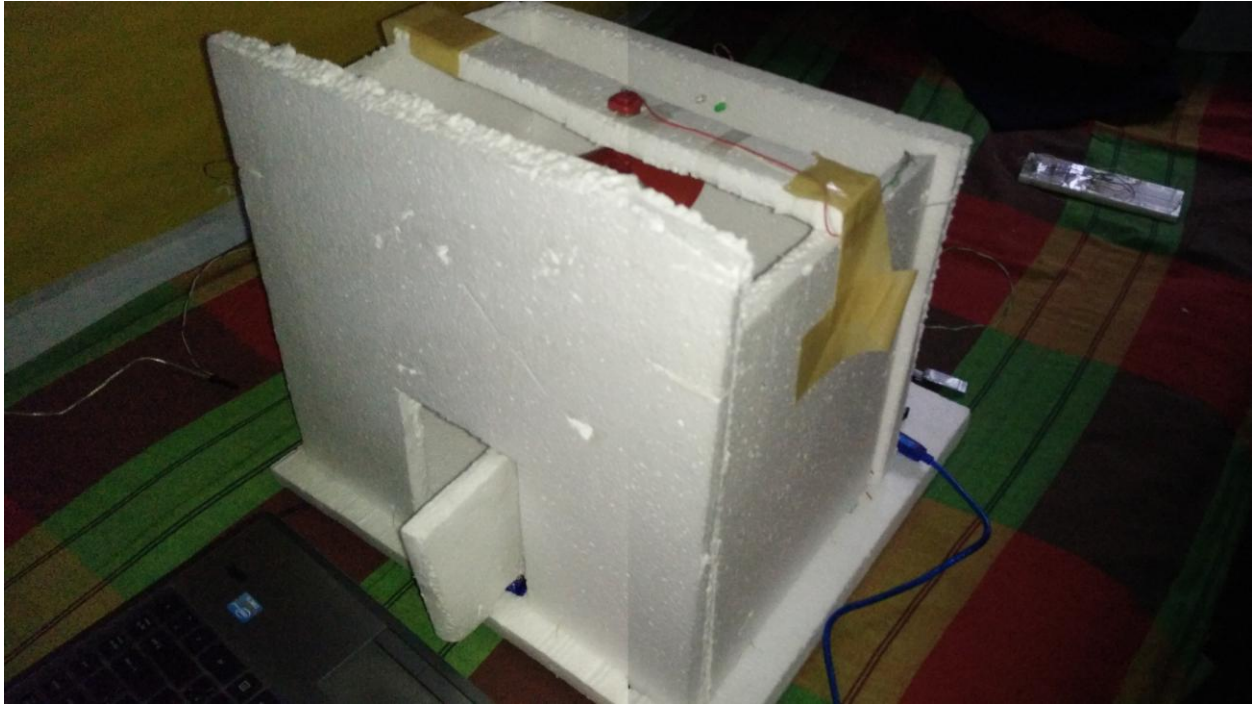
# Circuit Diagram:
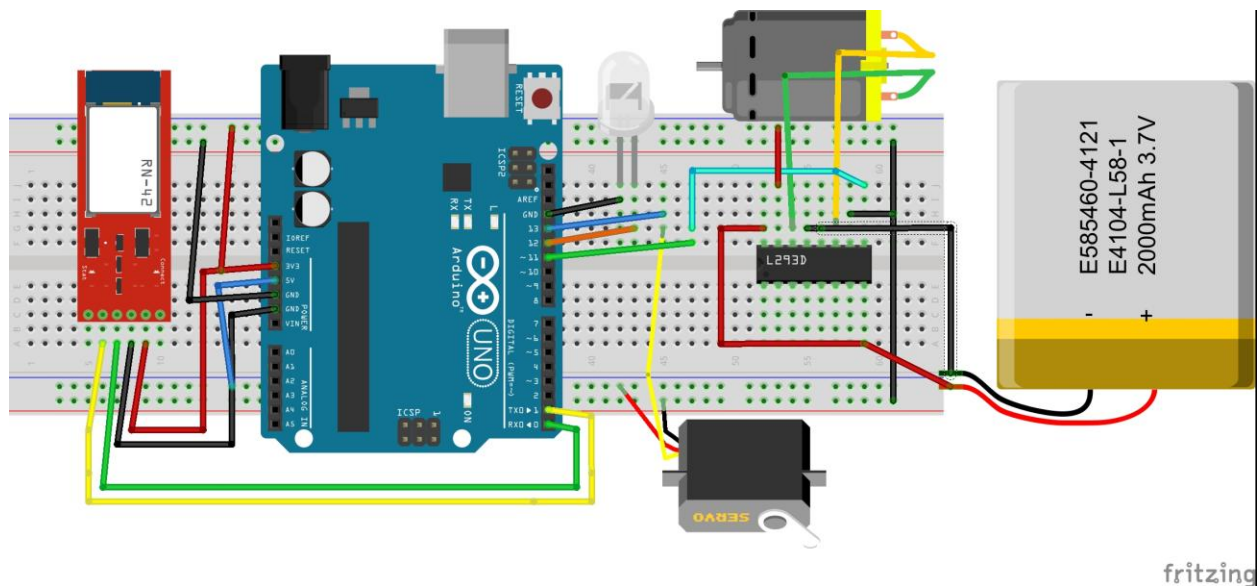
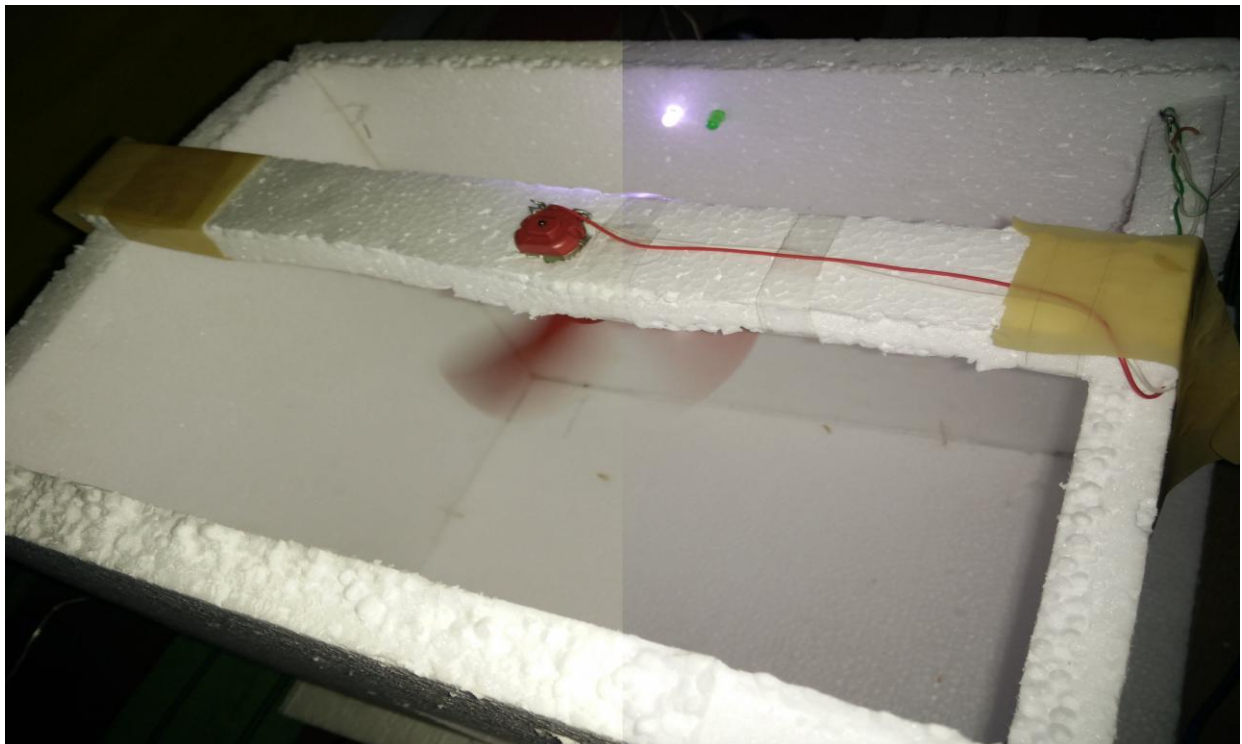# Current Prototype:



**Fig 2: Basic prototype of the SRS**
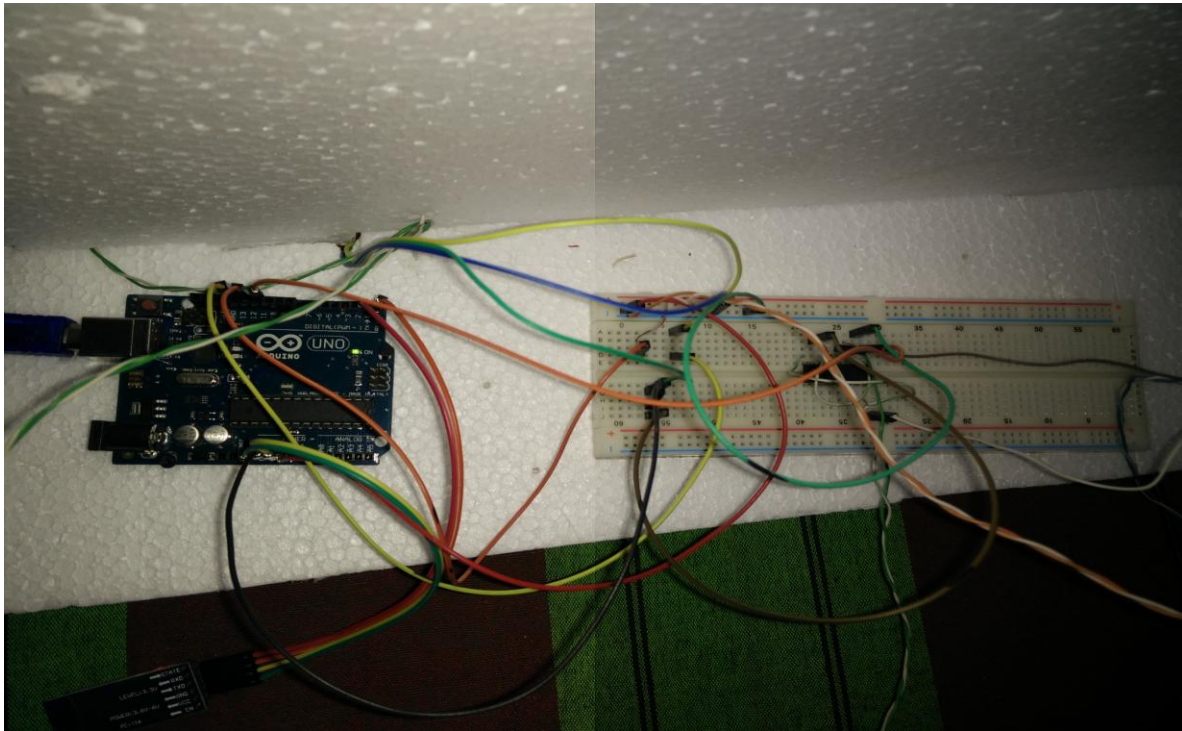


**Fig 3: Fan Control**

**Fig 4: Circuitry in the background**

# Software Requirements:

The control signals are sent to Bluetooth module via an android phone app which requires minimum Android 4.0(Ice-cream Sandwich)
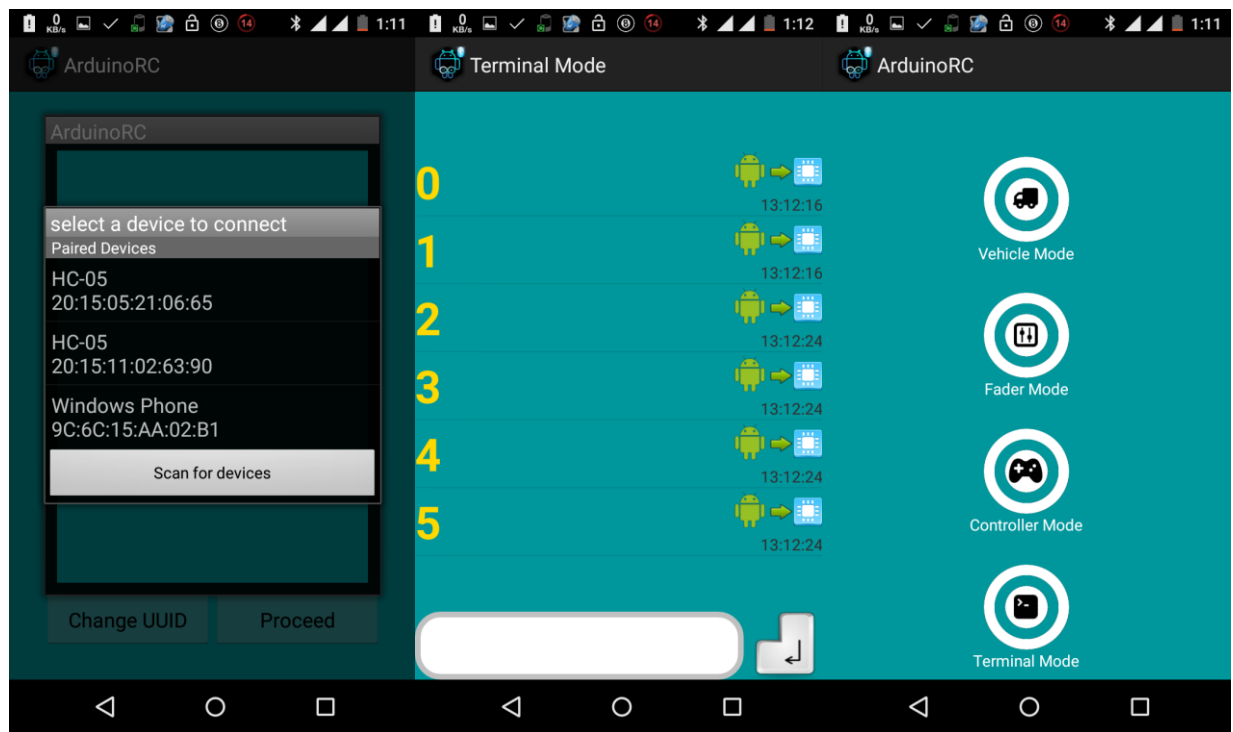


**Fig5. Screenshots of android app.**

# Benefits of application:

- Adds safety through appliance & lighting control.
- Secure home through door control.
- Increase awareness through automated light control.
- Increase convenience through temp adjustment.
- Saves time.
- Saves Money and increase convenience.
- Reduce electrical energy wastage.
- Contributes to economy.
- Increase peace of mind.
- Allows control of appliances while mobile.

# Future Plan:

- ✓ Support full time surveillance.
- ✓ Wide area coverage through wifi.
- ✓ Allow Remote Access through cloud based solution.
- ✓ More compact design.
- ✓ Modularity
- ✓ Message for unauthorized person with photo
- ✓ Voice control over natural language processing
- ✓ Control on the go
- ✓ Thief alert
- ✓ Baby Monitoring
- ✓ Old age monitoring
- ✓ Home atmosphere control
- ✓ Good companion like plays music on voice command
- ✓ Ultimately easy and modularity

## Conclusion:

For future work, the Window GUI will be implemented with speech recognition voice control. The android GUI will be implemented as a remote Bluetooth microphone to the Window GUI. All the voice signal inputs to the smart phone will be transmitted to the Window GUI for signal processing. Also, the push buttons implemented in low voltage activating switches will be replaced by capacitive sensing switches. All the future work is expected with minimal extra cost. The system implementation requires further funding.

# Arduino Sketch

```
#include <SoftwareSerial.h>
#include <Servo.h>

Servo myservo;
int pos = 0;
int DoorPin = 13;
int LightPin = 12;
int FanPin = 11;

SoftwareSerial BL(0,1);

void setup() {
  // put your setup code here, to run once:
  pinMode(DoorPin, OUTPUT);
  pinMode(LightPin, OUTPUT);
  pinMode(FanPin, OUTPUT);
  BL.begin(9600);
  myservo.attach(13);
}

void loop() {
  // put your main code here, to run repeatedly:
  if (BL.available()) {
  int Received = BL.read();
  if (Received == '0')
  {
    pos = 0;
    myservo.write(pos);
    delay(100);
  }
    //digitalWrite(DoorPin, HIGH);
  else if (Received == '1')
  {
     pos = 90;
    myservo.write(pos);
    delay(100);
  }
    //digitalWrite(DoorPin, LOW);

  if (Received == '2')
```

```
   digitalWrite(LightPin, HIGH);
  else if (Received == '3')
   digitalWrite(LightPin, LOW);

  if (Received == '4')
   digitalWrite(FanPin, HIGH);
  else if (Received == '5')
   digitalWrite(FanPin, LOW);
 }
}
```