



Fig 2. Arduino UNO

2.2 WI-FI MODULE

[2] **ESP8266** is a self-contained SoC with an integrated TCP/IP stack that allows you to access a Wi-Fi network for any microcontroller with UART. It can be both a Wi-Fi access point and a Wi-Fi client. It is pre-programmed with AT commands, so a microcontroller can be easily accessed and configured.



Fig 3. WI-FI Module

2.3 PIR SENSOR

The [3] **PIR** sensor detects changes in the amount of infrared radiation that affects it, which varies according to the temperature and surface characteristics of the objects in front of the sensor. When an object, such as a human, passes in front of the background, such as a wall, the temperature rises from room temperature to body temperature at that point in the field of view of the sensor and then returns back. The sensor converts the resulting change in the incoming infrared radiation into a change in the output voltage and thus, detection is triggered. Depending on an individual's presence, this system uses PIR sensors to control lights.



Fig 4. PIR Sensor

2.4 LDR SENSOR

Light dependent resistors (LDR) are light sensitive devices that are most frequently used to indicate the presence or absence of light or to measure the intensity of light. As light sensors, light-dependent resistors are most often used. They are often used when the presence and absence of light is detected or the light intensity is measured. Depending on the exterior lighting, this system uses LDR sensors to control the room lights.



Fig 5. Light Dependent Resistor

3. LITERATURE SURVEY

We have been studying various existing smart lighting systems and found a couple of them working towards achieving a similar objective as ours. We found out the common obstacle in developing a smart lighting system is the expensive cost of the components needed. Most of the systems are found using the less expensive Arduino UNO over the Raspberry Pi which on the other hand has the ability to control more devices but isn't economically preferable. Our project aims at smaller household lighting systems and hence incorporating a Raspberry Pi would not be suitable.

In [4] Implementation of Automatic Room Light Controller with Visitor Counter Design using 8051 Microcontroller (E.Shilpa1, Bushra Begum 2 et al.) the system uses sensors which are connected to each other via Infrared. When visitors cross the infrared bar, the microcontroller increments the counter and likewise reduces the counter if

person goes in opposite direction. It also uses a 7 Segment display to show the count.

Another system for [2] Automatic room light intensity detection and control using microprocessor and light sensors (Ying-Wen Bai ; Yi-Te Ku) also employs similar approach at controlling the lights in the room. A home light control module will be installed wherever needed. The module consists of four parts namely : PIR sensor, RF Module, Microprocessor and the Light Control circuit.

4. RESULTS

When the individual enters the room, the sensors will sense the movement and the Arduino will turn on the lights. And once no activity is sensed, lights will be turned off. Depending on the outdoor lightings, the room lights will be turned on or off.

Users can alternatively use the app with a login to control the lights with the Wi-Fi module. With the use of Wi-Fi module, it is possible to control lights from the local network.

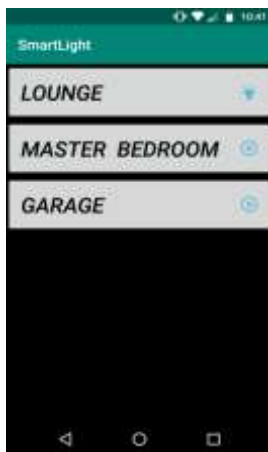


Fig 6. User Interface of the Android application

5. CONCLUSIONS

With the help of rapidly developing internet and communication technologies today's home also have strong computation and communication abilities. An IOT-based intelligent home is emerging as an important part of the world's smart and intelligent cities. The aim of this system is to improve the standard of living and to save energy and resources. This intelligent home system plays an important role in society's development. The system proposed can be implemented in accordance with user requirements.

6. REFERENCES

- 1) <https://store.arduino.cc/usa/arduino-uno-rev3>
- 2) <https://electrosome.com/home-automation-arduino-esp8266/>

- 3) PIR sensors: characterization and novel localization technique Authors: Sujay Narayana,R.Venkatesha Prasad, T.V.Prabhakar, Sripad S. Kowshik, Madhuri Seethala Iyer
- 4) Implementation of Automatic Room Light Controller with Visitor Counter Design using 8051 Microcontroller Author: E.Shilpa1, Bushra Begum 2 et al.
- 5) Automatic room light intensity detection and control using microprocessor and light sensors Author: Ying-Wen Bai ; Yi-Te Ku
- 6) <https://developer.android.com/guide/topics/ui>