M.KUMARASAMY
COLLEGE OF ENGINEERING
NAAC Accredited Autonomous Institution
Approved by AICTE & Affiliated to Anna University
ISO 9001:2015 & ISO 14001:2015 Certified Institution
Thalavapalayam, Karur – 639 113.

A Minor Project Report

on

AR WITH IOT

Submitted in partial fulfilment of requirements for the award of the degree

of

BACHELOR OF ENGINEERING

in

COMPUTER SCIENCE AND ENGINEERING

Under the guidance of

Mrs. K. MAKANYADEVI, M.E.,
Assistant Professor/CSE

Submitted by

ABISHEK R	**(20BCS4002)**
ASWINKUMAR R	**(20BCS4011)**
BHARATHIDHASAN M	**(20BCS4013)**
AJITH A	**(20BCS4301)**

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

M. KUMARASAMY COLLEGE OF ENGINEERING

(Autonomous)

KARUR – 639 113

MAY, 2022

M.KUMARASAMY
COLLEGE OF ENGINEERING
NAAC Accredited Autonomous Institution
Approved by AICTE & Affiliated to Anna University
ISO 9001:2015 & ISO 14001:2015 Certified Institution
Thalavapalayam, Karur – 639 113.

M. KUMARASAMY COLLEGE OF ENGINEERING

(Autonomous Institution affiliated to Anna University, Chennai)

KARUR – 639113

BONAFIDE CERTIFICATE

Certified that this minor project report **"AR WITH IOT"** is the bonafide work of **"ABISHEK.R (20BCS4002), ASWIN KUMAR.R (20BCS4011), BHARATHIDHASAN. M (20BCS4013), AJITH. A (20BCS4301)"** who carried out the project work during the academic year 2021-2022 under my supervision.

Signature

Mrs. K. MAKANYADEVI M.E.,

ASSISTANT PROFESSOR,

Department of Computer Science
and Engineering,
M. Kumarasamy College of Engineering,
Thalavapalayam, Karur -639113

Signature

Dr. S. THILAGAMANI M.E., Ph.D.,

HEAD OF THE DEPARTMENT,

Department of Computer Science
and Engineering,
M. Kumarasamy College of Engineering
Thalavapalayam, Karur -639113.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

VISION OF THE INSTITUTION

To emerge as a leader among the top institutions in the field of technical education.

MISSION OF THE INSTITUTION

- Produce smart technocrats with empirical knowledge who can surmount the global challenges.
- Create a diverse, fully-engaged, learner-centric campus environment to provide qualityeducation to the students.
- Maintain mutually beneficial partnerships with our alumni, industry, and Professional associations.

VISION OF THE DEPARTMENT

To achieve education and research excellence in Computer Science and Engineering

MISSION OF THE DEPARTMENT

- To excel in academic through effective teaching learning techniques
- To promote research in the area of computer science and engineering with the focus oninnovation
- To transform students into technically competent professionals with societal and ethical responsibilities

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

PEO 1: Graduates will have successful career in software industries and R&D divisions throughcontinuous learning.

PEO 2: Graduates will provide effective solutions for real world problems in the key domainof computer science and engineering and engage in lifelong learning.

PEO 3: Graduates will excel in their profession by being ethically and socially responsible.

PROGRAM OUTCOMES (POs)

Engineering students will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability:** Understand the impact of the professional engineeringsolutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities andnorms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a memberand leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

M.KUMARASAMY
COLLEGE OF ENGINEERING
NAAC Accredited Autonomous Institution
Approved by AICTE & Affiliated to Anna University
ISO 9001:2015 & ISO 14001:2015 Certified Institution
Thalavapalayam, Karur – 639 113.

PROGRAM SPECIFIC OUTCOMES (PSOs)

- **PSO1: Professional Skills:** Ability to apply the knowledge of computing techniques todesign and develop computerized solutions for the problems.
- **PSO2: Successful career:** Ability to utilize the computing skills and ethical values increating a successful career

ABSTRACT WITH POs AND PSOs MAPPING

ABSTRACT	POs MAPPED	PSOs MAPPED
The main motive of this project is to control the electrical lights and switches in AR (AUGMENTED REALITY) with the help of IOT (INTERNET OF THINGS). The augmented reality helps to make the button virtually and the IOT part helps to control the hardware devices and link augmented reality. We can control the electrical lights and switches without physical interaction by the help of internet. It is user interactive and reduces the time. This project mainly helps the physically challenged peoples to controls their home appliances. By using their WIFI or their mobile hotspot to control the appliances. The AR part helps to switch on or of the home appliances. We can control 'n' number of home appliances using AR with IOT platform. It is much faster and secure.	**PO1(3)** **PO2(3)** **PO3(2)** **PO4(2)** **PO5(2)** **PO6(1)** **PO7(3)** **PO8(2)** **PO9(3)** **PO10(3)** **PO11(2)** **PO12(2)**	**PSO1(3)** **PSO2(2)**

Note: 1- Low, 2-Medium, 3- High

SUPERVISOR **HEAD OF THE DEPARTMENT**

ABSTRACT

The main motive of this project is to control the electrical lights and switches in AR

(AUGMENTED REALITY) with the help of IOT (INTERNET OF THINGS). The augmented reality helps to make the button virtually and the IOT part helps to control the hardware devices and link augmented reality. We can control the electrical lights and switches without physical interaction by the help of internet. It is user interactive and reduces the time. This project mainly helps the physically challenged peoples to controls their home appliances. By using their WIFI or their mobile hotspot to control the appliances. The AR part helps to switch on or of the home appliances. We can control 'n' number of home appliances using AR with IOT platform**.**

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF SYMBOLS / ABBREVIATION

AR	-	Augmented Reality
IOT	-	Internet of Things
C#	-	C Sharp
MCU	-	Micro Controller Unit
APK	-	Android Application package

CHAPTER 1

INTRODUCTION

This project is containing two parts IOT (Internet of Things) and AR (Augmented Reality). In IOT part we using hardware components such as relay module and WIFI controller (node MCU) and Auth token from Blynk app and Arduino-ide app to insert code into the WIFI controller. In AR we are using unity hub to create a virtual switchboard having virtual buttons which contains Auth token from the IOT part and after extracting the AR project as an APK file and this will be installed in the mobile phone through which we can control the appliances virtually by phone through the help of WIFI and IOT.

Figure 1.1: Introduction of our project

1.1 OVERVIEW

In this project we use both hardware and software to communicate the lights. We use Blynk app to create a button to communicate the WIFI controller to transmit the signal to WIFI controller. The WIFI controller send the signal to the relay module which

is act as a switch and the bulb are connected with relay module and with switch board. Next, we create a API for Blynk buttons the API is used in AR part to create a switch to control the lights. we turn on virtual button in AR the signal sends to Blynk and the Blynk send to WIFI controller and the WIFI controller send to relay module finally relay module send to bulb. If ON means the bulb will glow, OFF means the bulb will OFF.

1.2 DOMAIN INTRODUCTION

1.2.1 AR

Augmented reality overlays digital content and information onto the physical world as if they're actually there with you, in your own space. AR opens up new ways for your devices to be helpful throughout your day by letting you experience digital content in the same way you experience the world. It lets you search things visually, simply by pointing your camera at them. It can put answers right where your questions are by overlaying visual, immersive content on top of your real world. Augmented reality (AR) involves overlaying visual, auditory, or other sensory information onto the world in order to enhance one's experience. Retailers and other companies can use augmented reality to promote products or services, launch novel marketing campaigns, and collect unique user data. Augmented reality continues to develop and become more pervasive among a wide range of applications. Since its conception, marketers and technology firms have had to battle the perception that augmented reality is little more than a marketing tool. Augmented reality uses the existing real-world environment and puts virtual information on top of it to enhance the experience. Augmented reality is a highly visual, interactive method of presenting relevant digital information in the context of the physical environment connecting employees and improving business outcomes. Industrial augmented reality offers a better way to create and deliver easily consumable work instructions by overlaying digital content onto real-world work environments.

1.2.2 IOT

The Internet of Things (IOT) describes the network of physical objects “things” that are embedded with sensors, software, and other technologies for the purpose of connecting and exchanging data with other devices and systems over the internet. These devices range from ordinary household objects to sophisticated industrial tools. With more than 7 billion connected IOT devices today, experts are expecting this number to grow to 10 billion by 2020 and 22 billion by 2025. Oracle has a network of device partners. IOT has become one of the most important technologies of the 21st century. Now that we can connect everyday objects kitchen appliances, cars, thermostats, baby monitors—to the internet via embedded devices, seamless communication is possible between people, processes, and things. The Internet of Things, or IOT, refers to the billions of physical devices around the world that are now connected to the internet, all collecting and sharing data. The Internet of Things is making the fabric of the world around us smarter and more responsive, merging the digital and physical universes. IOT applications have made urban planning and infrastructure maintenance more efficient. Buildings such as college campuses and commercial buildings use IOT applications to drive greater operational efficiencies. The Internet of Things (IOT) is the network of physical objects that contain embedded technology to communicate and sense or interact with their internal states or the external environment. The IOT is a giant network of connected things and people – all of which collect and share data about the way they are used and about the environment around them.

1.2.3 C#

C# (pronounced "C-sharp") is an object-oriented programming language from Microsoft that aims to combine the computing power of C++ with the programming ease of Visual Basic. C# is based on C++ and contains features similar to those of Java. C# designed work with Microsoft's. NET platform. C# (C-Sharp) is a programming language developed by Microsoft that runs on the .NET Framework. C# is used to

develop web apps, desktop apps, mobile apps, games and much more. It's a high-level language, relatively easy to read, with many of the most complex tasks abstracted away, so the programmer doesn't have to worry about them.

1.3 PROBLEM STATEMENT

Physically challenged people are struggled to switch on the home appliances it increases the time to work. While in tied mode we irritate to switch on the light so it increases our pressure and also for off the switch the light.

- Physically challenged people are difficult to switch on the home appliances.
- We forget to switch of the light while going outside it will increase our EB bill.
- Home appliances on for long time it will damage the product.
- We forget to switch of the light while going to outside so we again come to home switch of the appliances so it increases the time.

1.4 OBJECTIVE

The main motive of this project is to control the electrical lights and switches in AR (AUGMENTED REALITY) with the help of IOT (INTERNET OF THINGS). We can control the electrical lights and switches without physical interaction by the help of internet. It is user interactive and reduces the time.

- This project mainly helpful for physically challenged peoples.
- It also helpful for going outside peoples for long time.
- They can easily control their appliances using their mobile phone.
- It will reduce their time and it much faster.
- Physically challenged people control appliances from their place.

CHAPTER 2

EXISTING SYSTEM

In existing system architecture, we can go to near switch board and ON or OFF the switch. It irritates when we are in tired. It is difficult for physically challenged peoples and it is waste of time.

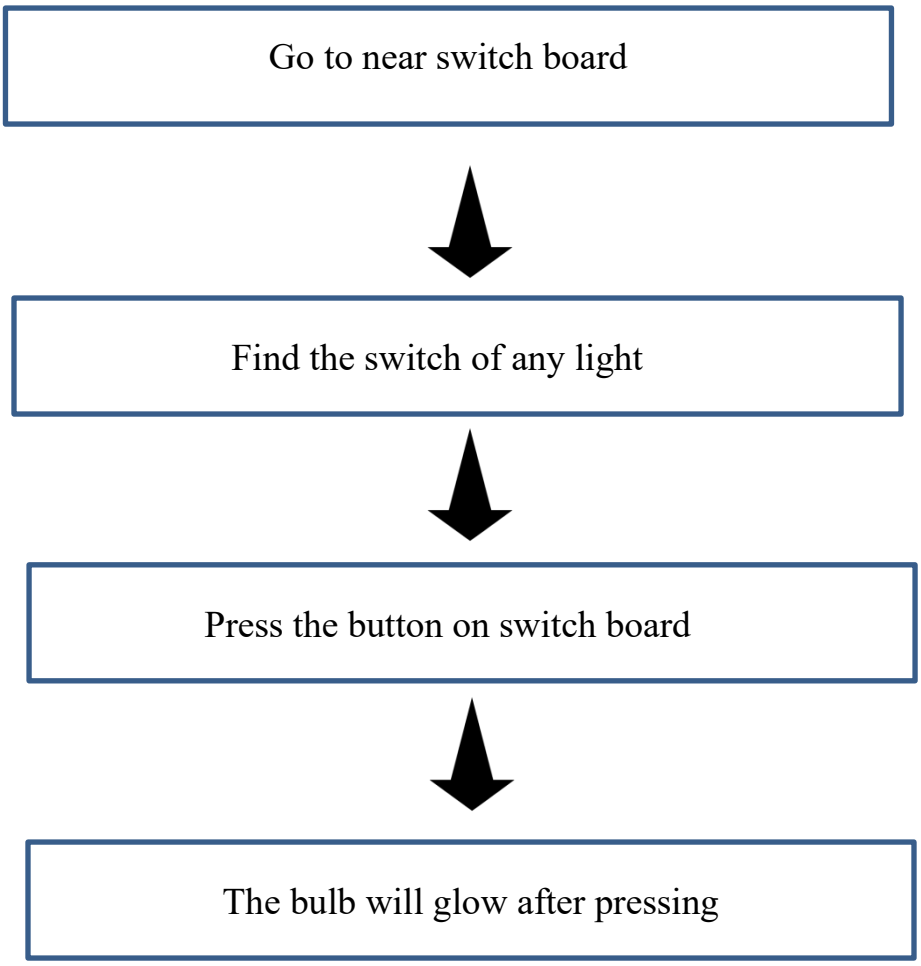

Figure 2.1: Block diagram of Existing System.

CHAPTER 3

PROPOSED SYSTEM

In proposed system we can control the light using the APK file in your laptop or mobile Phone. You can control the light with your WIFI or your personal hotspot. You control your light anywhere in the world. It reduces your time, faster and secure.

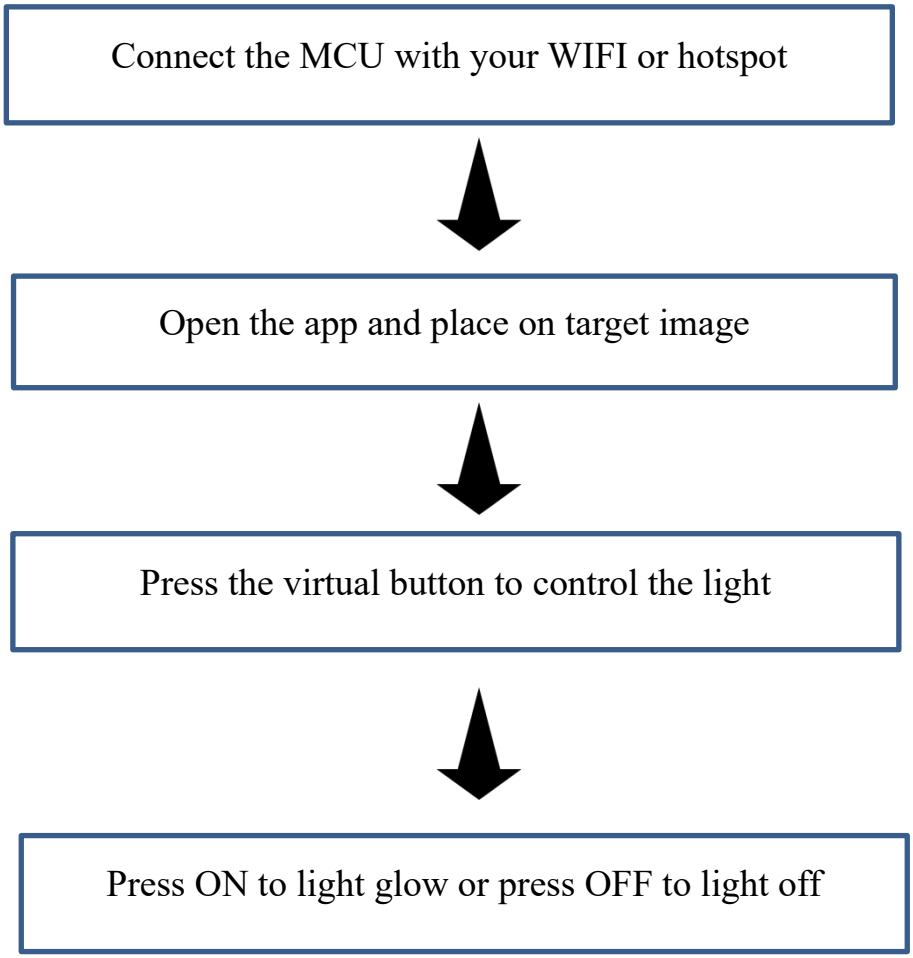

Figure 3.1: Block diagram of Proposed System

CHAPTER 4

PROJECT METHODOLOGY

4.1 BLOCK DIAGRAM OF AR WITH IOT

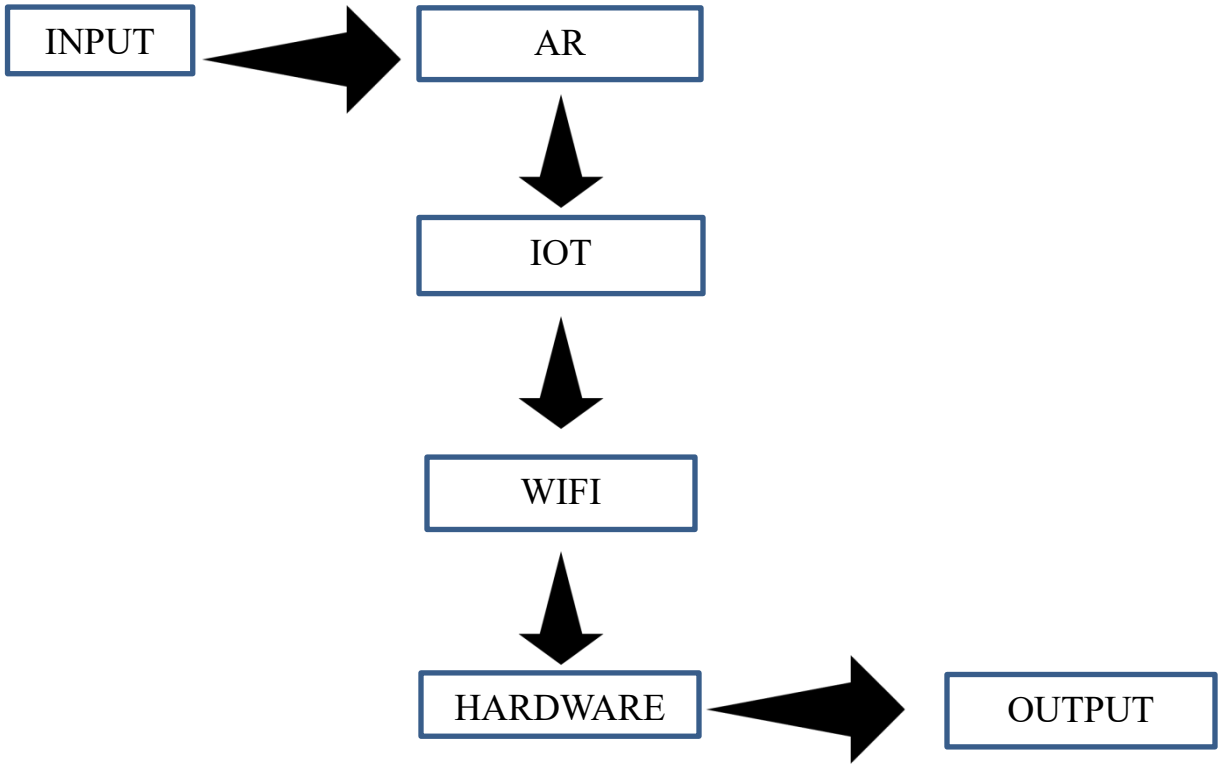

Figure 4.1: Block diagram of "AR WITH IOT"

In this above diagram it represents our project methodology. The input is passed through the APK file which is created in unity hub. the virtual button is visible on target image we can give input by pressing virtual button, after pressing the it the signal is pass to hardware which is connected with WIFI or hotspot. the hardware is the IOT part the hardware is connected with bulb. After pressing the signal send to hardware the send the signal to bulb. After that bulb will glow or based on their input.

4.2 MODULE DESCRIPTION

UNITY HUB

- Add the virtual buttons in AR (augmented reality) using unity hub software.
- Add a background image.
- Write a C# script code in AR.

ARDUINO

- Install the esp8266 libraries in Arduino IDE.
- Insert a your WIFI name, password and programs in esp8266 using Arduino.

BYLNK

- Create a button in Blynk.
- Paste the token in Arduino and insert a code to esp8266.
- Connect the esp8266 with relay module and with bulb or led.

CHAPTER 5

RESULTS AND DISCUSSION

Figure 5.1: Screenshot of Target image with AR

This figure deals with the target image which is used for visibility of virtual button. We want to place the phone on this image otherwise the virtual button is not visible. We paste this image on wall and we can control the home appliances. This is the image which we place it on AR part of this project.

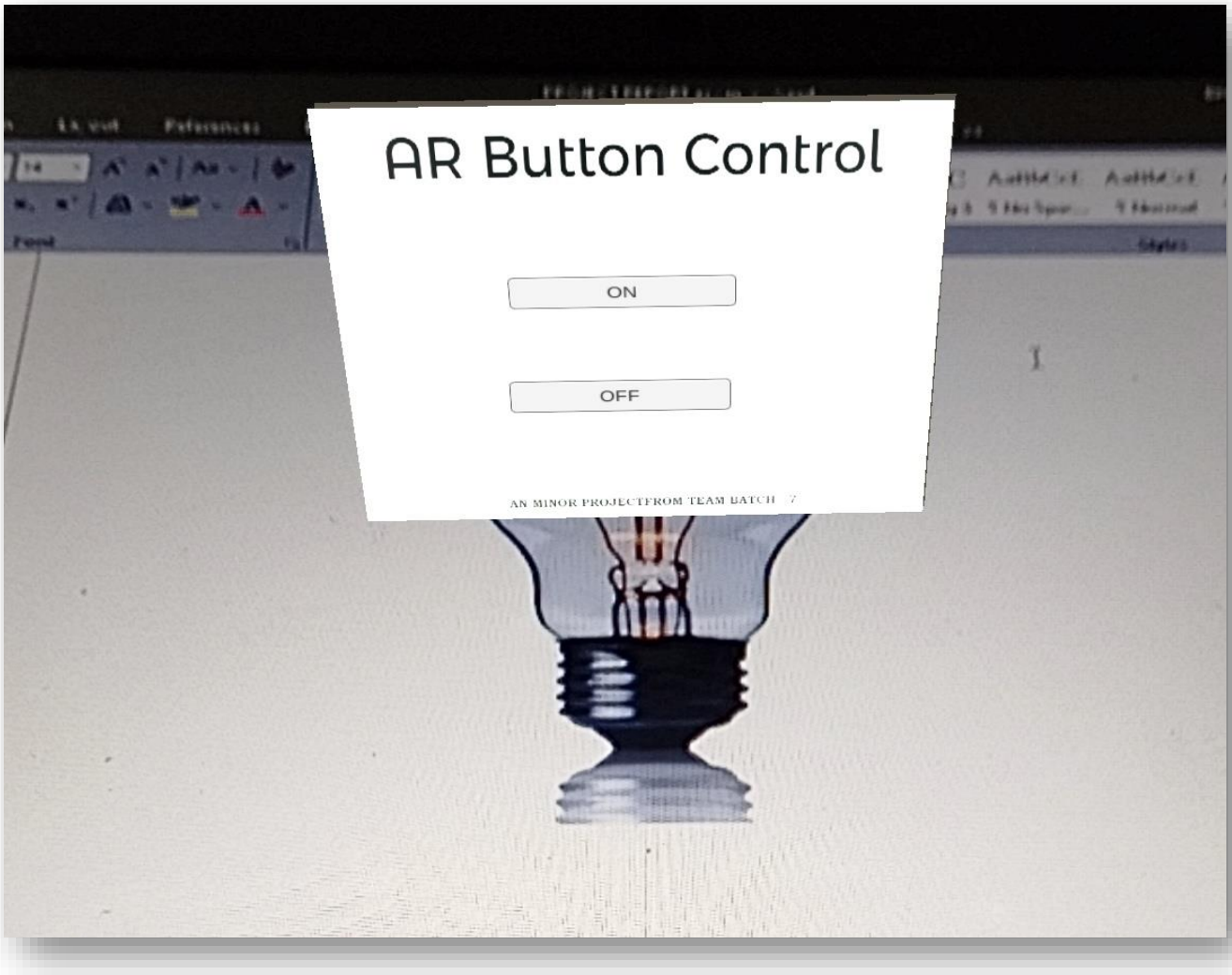

Figure 5.2: Screenshot of ON &OFF Button in AR

This figure shows the frame of the virtual buttons on the target image the virtual button is successfully is visible in target image which we used in AR part. In virtual plane the ON and OFF buttons are visible. If you want to switch on the light means you can touch the ON or you want to OFF the button means you can press the OFF button.

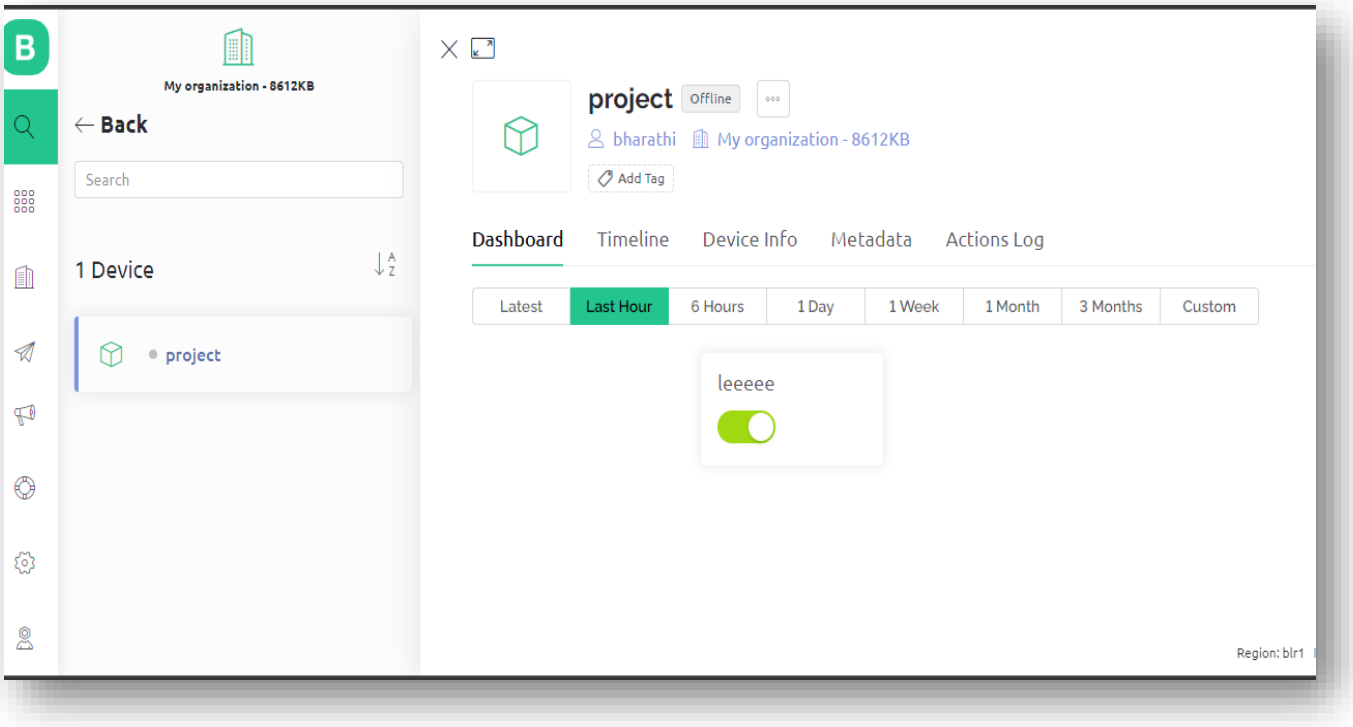

Figure 5.3: Screenshot of IOT

This figure shows the frame that the buttons in the Blynk app. The button which we created to control the WIFI controller. When we press the button the WIFI controller send signal to relay module to pass the current and when we press again the relay module stop the current.

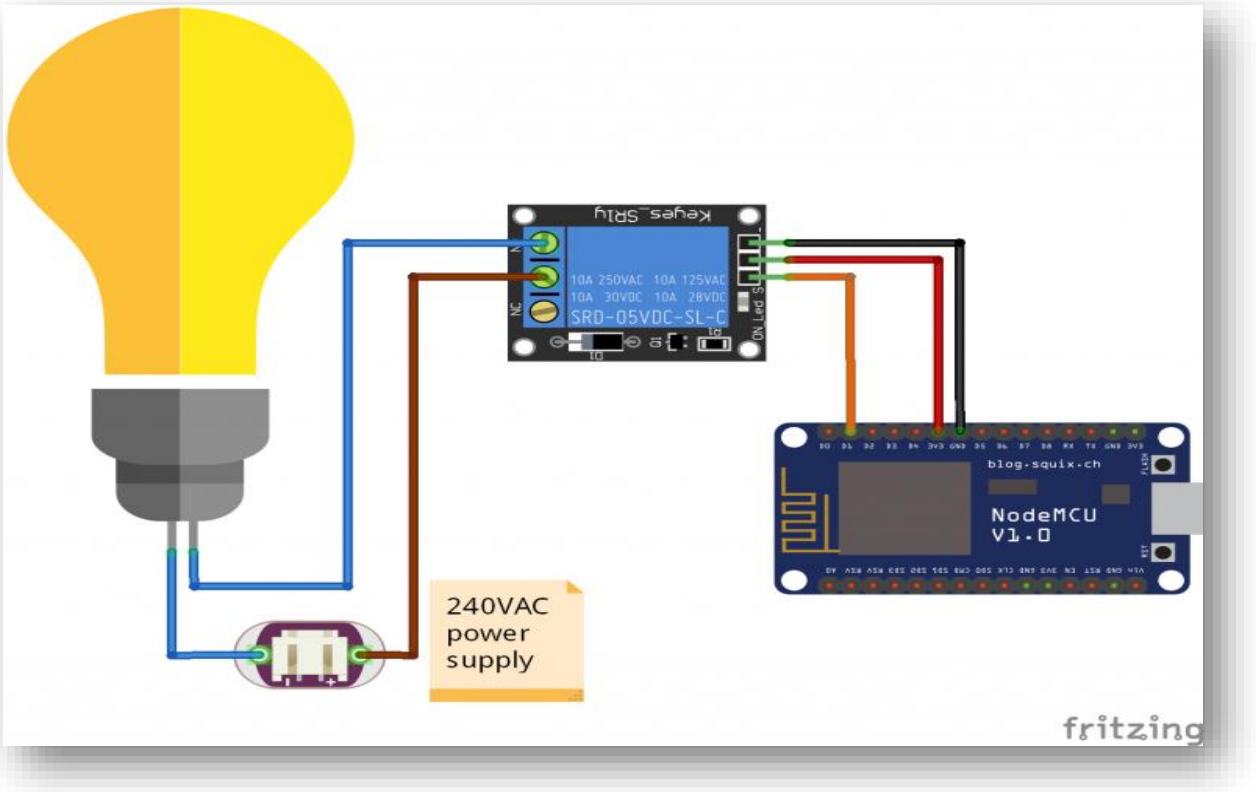

Figure 5.4: Screenshot of circuit diagram

This figure shows the frame that the circuit connection of WIFI controller, relay module and with bulb. When we press the ON virtual button the signal sends to WIFI controller. This controller connected with relay module and that relay module connects with bulb to transfer the signal.

CHAPTER 6

CONCLUSION AND SCOPE FOR FUTURE WORKS

In this project we control home appliances using AR with IOT so it really helpful for physically challenged peoples. They can control using mobile of laptops. If touch ON virtual button means the light will ON if touch OFF virtual button means the light will OFF. In future we can control the home appliances using voice control as well as AR with IOT. We can also add features like “dim the light as well as bright the light”.

REFERENCES

[1] https://blynk.io/

[2] https://unity3d.com/get-unity/

[3] https://techiesms.com/iot-projects/switches-in-the-air-ar-iot-using-unity-blynk

APPENDIX

CODE FOR AR PART TO LINK API TOKEN WITH IOT

```
using System.Collections;
using System.Collections.Generic;
using UnityEngine;
using UnityEngine.Networking;
public class ClickUrl : MonoBehaviour
{
public string url;
public void open()
{
StartCoroutine(GetRequest(url));
}
IEnumerator GetRequest(string uri)
{
using (UnityWebRequest webRequest = UnityWebRequest.Get(uri))
{
yield return webRequest.SendWebRequest();
}}
}
```

CODE FOR ARDUINO TO WIFI CONTROLLER:

```
//Include the library files

#define BLYNK_PRINT Serial

#include <ESP8266WiFi.h>

#include <BlynkSimpleEsp8266.h>

#define BLYNK_AUTH_TOKEN "XgreDxCJ7phAfNCAvJTLSKuQzR71JSuR"

//Enter your blynk auth token

char auth[] = BLYNK_AUTH_TOKEN;

char ssid[] = "Abishek";//Enter your WIFI name

char pass[] = "abiabishek2002";//Enter your WIFI password

//Get the button value

BLYNK_WRITE(V0) {

  digitalWrite(D1, param.asInt());

}

void setup() {

  pinMode(D1, OUTPUT);

  Blynk.begin(auth, ssid, pass, "blynk.cloud", 80);

}

void loop() {  Blynk.run();

}
```