PROJECT REPORT

IMAGINATE
(Augmented Reality Integration with IoT)

Semester Project
IOT605

Submitted by:
SHRUTI VIJ (1904720)
GARVIT KULSHRESTHA (1904692)

DEPARTMENT OF PHYSICS & COMPUTER SCIENCE
FACULTY OF SCIENCE
DAYALBAGH EDUCATIONAL INSTITUTE DAYALBAGH
AGRA(UP)-282005

DECLARATION

We therefore declare that the work on this project is ours without the properly approved quotations and summaries. The project was not accepted for any degree and was not submitted simultaneously for further awards.

Garvit Kulshrestha
1904692

Shruti Vij
1904720

ACKNOWLEDGEMENT

It gives me great pleasure to express my deepest gratitude and sincere gratitude to my highly regarded and respected guides Mrs. Vandana Mairh and Mr. Amarjeet Singh Chauhan for their valuable guidance, encouragement and help to complete this mission. Their helpful suggestions for all of this work and co-operation are widely accepted.

I thank my teachers for their constant support and guidance. Thank you so much for your constant support and criticism which proves to be very helpful in completing this work.

ABSTRACT

This project integrates augmented reality with the Internet of Things. This project takes the user interaction to another level. We have built a project where we have developed a smart home control system but the way users interact with it is quite different. We have developed a mobile application which has a camera integration, whenever a user moves that camera towards a specific image then that screen shows the buttons to on or off the fan. This is a new era of user interaction.

TABLE OF CONTENTS

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

We have built a project with augmented reality and IoT integration. We have developed a smart home control system. We have a fan in the system which has no physical button but it is controlled using virtual buttons. It is a new era of user experience. We have connected a dc motor to the NodeMCU and NodeMCU automatically connects to a specific Wifi and finally to a Blynk Cloud server. We have used Blynk Restful https api to connect this blynk server to a mobile application. We have used Unity to develop a mobile application which has an AR Camera integrated with it. We have pre saved an image in the application, whenever the camera sees that image then it just virtually pops up buttons in the air and you can just touch these buttons to turn ON/OFF the fan. When you touch the button in the air then the blynk restful api sends the command to the blynk server and then blynk server sends the command to NodeMCU to turn on or turn off the motor fan.

CHAPTER 2

COMPONENTS

NodeMCU

NodeMCU is an inexpensive open source IoT platform. It first installed the firmware running on ESP8266 Wi-Fi SoC from Espressif Systems, as well as hardware based ESP-12 module. Later, support for ESP32 32-bit MCU was added.

USES

We have used this as a microcontroller and to connect to the wifi. It will send the commands to and fro to the blynk server.

Figure 1 : NodeMCU

DC Motor

A DC engine is any class of rotating electric motors that converts current (DC) into mechanical power.

USES

WE used this to connect with NodeMCU through relay as a fan motor.

Figure2 : DC Motor

RELAY

A component that can switch the electricity power based on the input signal.

USES

We have used this to turn on and off the DC motor.

Figure 3 : Relay

Connecting Wires
Power Supply
Power Cord

CHAPTER 3

TECHNOLOGIES

Blynk Cloud

Blynk Cloud is an IoT cloud solution that provides you an interface to connect your device to the cloud. We have used the blynk cloud and try to connect our NodeMCU with the Blynk cloud so that we can send the commands to and fro the device from cloud.
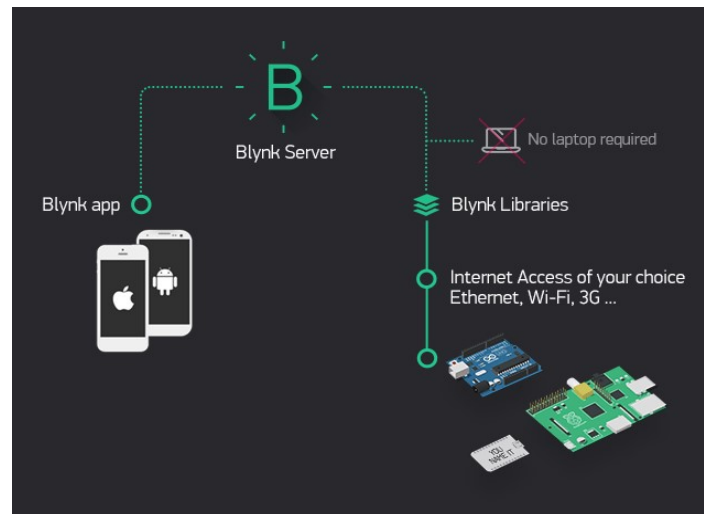

Figure 4 : Blynk Cloud

Unity

Unity is an application development tool. We have used this to develop an AR based android mobile application which has an AR camera integrated with it so that the application can have a camera interface and impose virtual buttons on an image.

Figure 5: Unity Interface

Blynk Restful API

Blynk Restful Api allowed us to integrate the blynk cloud with the Unity android mobile application. This is a HTTP link that can be integrated to change the state of the pin so that it can turn on or off the appliance (fan in our case).
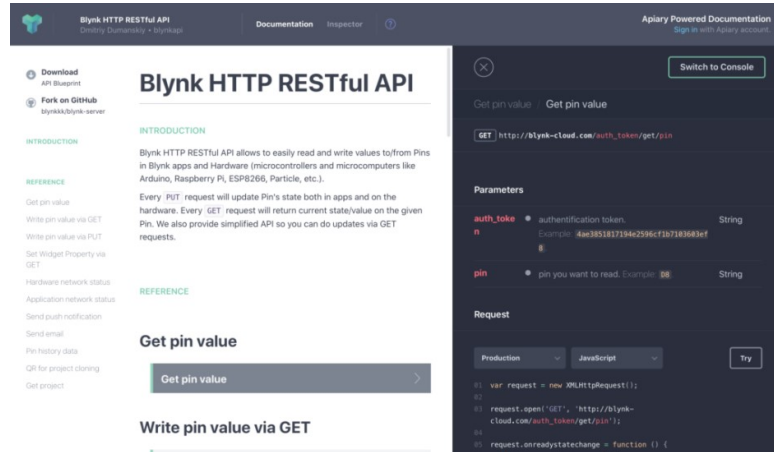

Figure 6 : Resful API Interface

Arduino IDE

We have used Arduino IDE to develop and upload a code to the NodeMCU. It provides and easy to use interface to deal with NodeMCU.
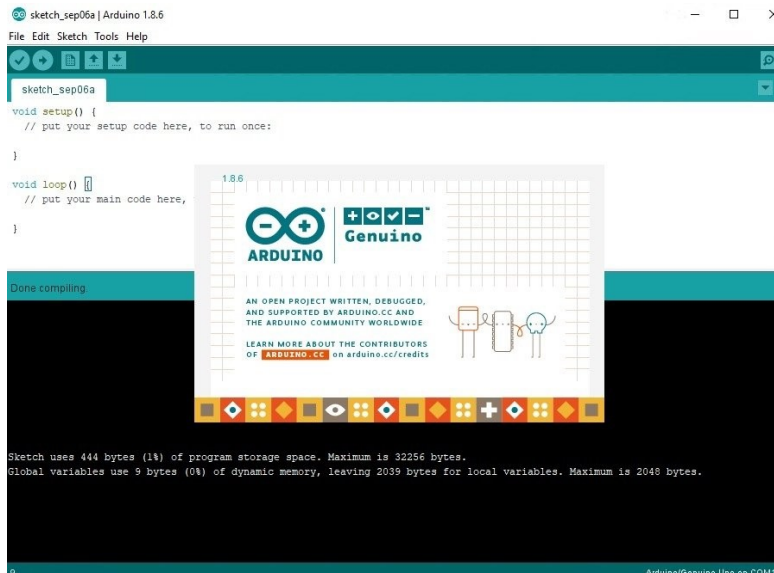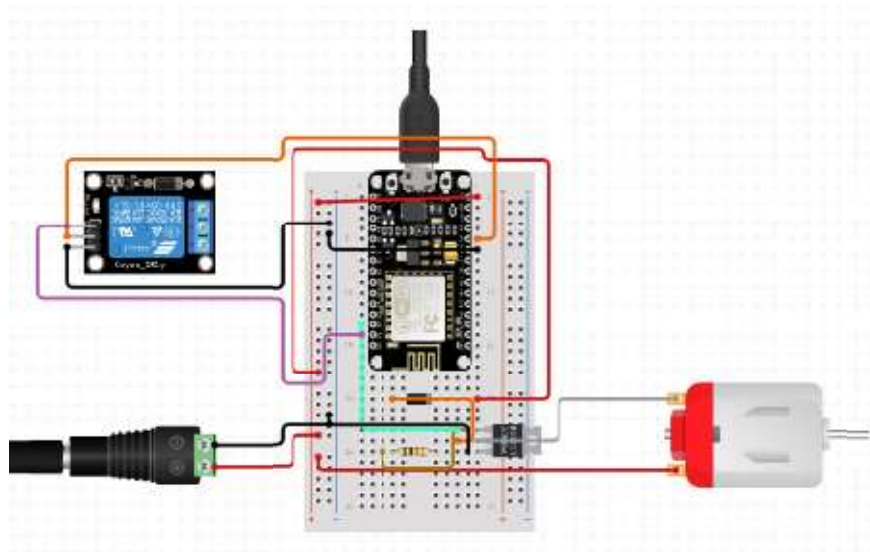

Figure 7 : Arduino IDE

CHAPTER 4

CIRCUIT DIAGRAM AND TESTING

4.1 Circuit Diagram

Make sure to integrate an available image for the hyper positioning of the virtual buttons.
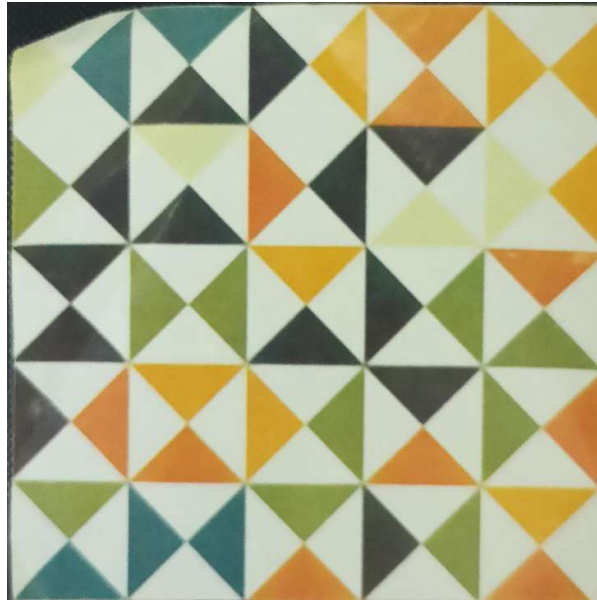
4.2 We Have Used This Image

Figure 9 : Image Used

The connections of the components is as follows -

- NodeMCU Pin D4 to relay input signal.

- NodeMCU GND pin to relay GND pin.

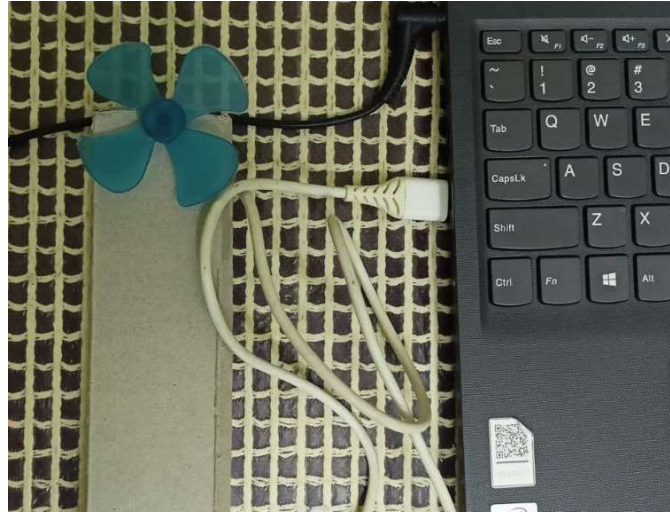- NodeMCU VCC pin to relay VCC pin.

CHAPTER 5

RESULTS

Figure 10: Final Project

CONCLUSION

We have developed a completed user experience based on AR which is integrated with IoT.