A Major Project Report On

**COVID-19 DETECTION AND SAFETY MEASURE AUTOMATION USING ARDUINO**

*Submitted in partial fulfilment of the requirement for the award of the degree of*

**BACHELOR OF TECHNOLOGY IN**

**ELECTRONICS AND COMMUNICATION ENGINEERING**

SUBMITED BY

**C. Shashank (17P61A0429)**

**A. Hemanth (17P61A0403)**

**E. Bhanu Prakash (17P61A0442)**

**K. Sai Prasad (17C21A0411)**

Under the Esteemed Guidance of

**Mrs. S. Preethi**

Assistant Professor in ECE Department VBIT, Hyderabad

Department of Electronics and Communication Engineering



## (Affiliated to JNTU Hyderabad, Approved by APSCHE &AICTE) Aushapur (v), Ghatkesar (m), Medchal Dist, Hyderabad-501301

2020-21



**Department of Electronics and Communication Engineering**

**CERTIFICATE**

This is to certify that the major project report titled on **“COVID-19 DETECTION AND SAFETY MEASURE AUTOMATION USING ARDUINO**” is being submitted by students **C. SHASHANK (17P61A0429),** **A. HEMANTH (17P61A0403), E. BHANU PRAKASH (17P61A0442), K. SAI PRASAD (17C21A0411)** in partial fulfilment for the award of the Degree of Bachelor of Technology in **ELECTRONICS AND COMMUNICATION ENGINEERING** to Jawaharlal Nehru Technological University, Hyderabad, is a record of a bonafide work carried out by them under my guidance and supervision.

The results embedded in this project report have not been submitted to any other University/ Institution for the award of any Degree.

### Internal Guide Head of the Department, ECE Mrs. S. Preethi Dr. Y. Srinivas

**Assistant Professor Professor**



**Department of Electronics and Communication Engineering CANDIDATE DECLARATION**

We hereby declare that this major project report titled on “**COVID-19 DETECTION AND SAFETY MEASURE AUTOMATION USING ARDUINO**” submitted by us to the Department of Electronics and Communication Engineering, Vignana Bharathi Institute of Technology, Aushapur, under Jawaharlal Nehru Technological University-Hyderabad, is a bonafide work undertaken by **C. SHASHANK (17P61A0429), A. HEMANTH (17P61A0403), E. BHANU PRAKASH (17P61A0442), K. SAI PRASAD (17C21A0411)** and it is not submitted to any other University or Institution for the award of any degree.

### C. SHASHANK (17P61A0429)

### A. HEMANTH (17P61A0403)

**E. BHANU PRAKASH (17P61A0442)**

**K. SAI PRASAD (17C21A0411)**



**ACKNOWLEDGEMENT**

At the outset, we sincerely thank to the management and department of ECE for providing concurrent support for our major project to complete in stipulated time.

Firstly, we would thank the Management for providing constant support throughout the completion of project. Secondly, we sincerely thank our beloved Principal, **Dr.G.Amarendar Rao** and Head of the Department, **Dr. Y. Srinivas**, for their kind cooperation and encouragement for the successful completion of project report and providing the necessary facilities.

We express our sincere gratitude to our project guide **Mrs.S.Preethi**, Assistant Professor, our project coordinator **Mrs.P.Sreevani**, Assistant Professor, and other faculty members for their insightful comments and constructive suggestions to improve the quality of this project work.

### C. SHASHANK (17P61A0429)

### A. HEMANTH (17P61A0403)

**E. BHANU PRAKASH (17P61A0442)**

**K. SAI PRASAD (17C21A0411)**

# TABLE OF CONTENTS

## PAGE NO

*Abstract i*

*List of figures ii*

*List of tables iv*

**CHAPTER-1: INTRODUCTION**

* 1. Overview 1
  2. Objective Of The Project 1
  3. Proposed System 2
  4. Block Diagram 2
  5. Working 3
  6. Components And Tools Used 3
  7. Software Tools 4

**CHAPTER-2: EMBEDDED SYSTEMS**

* 1. Introduction To Embedded Systems 5
  2. Features Of Embedded Systems 5
  3. Characteristics Of Embedded Systems 6
  4. Embedded System Architecture 7
  5. Types Of Embedded System 7

**CHAPTER-3: HARDWARE MODULES**

* 1. Arduino Uno Controller 9
  2. RC522 RFID Module 10
  3. HC-SR04 Ultrasonic Sensor 15
  4. SG-90 Servo Motor 20

**CHAPTER-4: SCHEMATIC DIAGRAM AND ITS WORKING**

* 1. Circuit Diagram 23
  2. Functional Description 23
  3. Flow Chart 23

**CHAPTER-5: SOFTWARE IMPLEMENTATION**

5.1 Arduino IDE Software 25

**CHAPTER-6: ADVANTAGES AND APPLICATIONS**

* 1. Applications 28
  2. Advantages 28

**CHAPTER-7: RESULTS**

**7**.1 Results 29

**CHAPTER-8: CONCLUSION AND FUTURE SCOPE**

* 1. Conclusion 32
  2. Future Scope 32

**BIBLIOGRAPHY APPENDIX**

**ABSTRACT**

Telling people to stay safe may seem a nice and easy thing to do, but it assumes that they can stay safe at home, and it also implies that they have a duty to do so, which makes them get out of the house. While most of them obey the safety precautions, most of them don’t. But “stay safe” is a rather stealthy way of conveying that. The novel COVID-19 has taught us a lot more about the safety measures that have to be taken to keep ourselves protected from this situation.

With safety being the utmost priority during the current pandemic situation, the project consists of a complete kit that will help people to detect the Covid-19 affected person and to provide safe entrance into places using automated hand sanitization.

The project uses RFID tags and when scanned, will tell the equipment if the person is tested for Covid-19 positive or negative, the door opens if the RFID reads negative and if the RFID reads positive the door stays closed. Once it is safe to enter the place. It dispenses the liquid disinfectants using an Ultrasonic Sensorand Servo motorfor the person to sanitize their hands, in-case of excess dispensing it dispenses the tissue papers using another Ultrasonic sensor and a Servo Motor.

*i*

### LIST OF FIGURES

|  |  |  |
| --- | --- | --- |
| **S.No** | **Title** | **Page.No** |
| 1 | Figure: 1.1 Block Diagram | 2 |
| 2 | Figure: 1.2 Work Flow | 3 |
| 3 | Figure: 3.1 RFID Tag Internal Structure | 11 |
| 4 | Figure: 3.2 RFID Reader Internal Structure | 12 |
| 5 | Figure: 3.3 RC522 RFID Module | 13 |
| 6 | Figure: 3.4 RFID Pin Description | 14 |
| 7 | Figure: 3.5 HC-SR04 Ultrasonic Sensor | 15 |
| 8 | Figure: 3.6 Representation of HC-SR04 Response | 16 |
| 9 | Figure: 3.7 Working of HC-sr04 Ultrasonic Sensor | 18 |
| 10 | Figure: 3.8 Pin Diagram of HC-SR04 Ultrasonic Sensor | 19 |
| 11 | Figure: 3.9 SG-90 Servo Motor | 21 |
| 12 | Figure: 3.10 Response of SG-90 Servo Motor | 22 |
| 13 | Figure: 3.11 Dimensions of SG-90 Servo Motor | 22 |
| 14 | Figure: 4.1 Circuit Diagram  *ii* | 23 |

|  |  |  |
| --- | --- | --- |
| 15 | Figure: 4.2 Flow Chart | 24 |
| 16 | Figure: 5.1 Selecting the board | 26 |
| 17 | Figure: 5.2 Project code | 26 |
| 18 | Figure: 5.3 Compiling the code | 27 |
| 19 | Figure: 5.4 Dumping the code | 27 |
| 20 | Figure: 5.5 Code uploaded successfully | 27 |
| 21 | Figure: 7.1 Complete setup of the prototype | 29 |
| 22 | Figure: 7.2 Access Granted | 30 |
| 23 | Figure: 7.3 Access Denied | 30 |
| 24 | Figure: 7.4 Sanitizer Dispenser Activated | 31 |
| 25 | Figure: 7.3 Tissue Dispenser Activated | 31 |

*iii*

|  |  |  |  |
| --- | --- | --- | --- |
|  | | **LIST OF TABLES** |  |
| **S.No** |  | **Title** | **Page No** |
| 1 | Table no: | 3.1 RC522 RFID Specifications | 13 |
| 2 | Table no: | 3.2 HC-SR04 Ultrasonic Sensor Specifications | 17 |
| 3 | Table no: | 3.3 SG-90 Servo Motor Specifications | 22 |

*iv*