iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 8 **Issue:** V **Month of publication:** May 2020

DOI: http://doi.org/10.22214/ijraset.2020.5293

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429
Volume 8 Issue V May 2020- Available at www.ijraset.com

NFC based Smart Attendance System using Raspberry Pi 3 Model B+

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***Abstract:** This project presents the concept, functional physical model of a smart attendance system for the use in areas such as schools, colleges and corporate offices. The system uses a Raspberry Pi 3 Model B+ for registering the arrival time as well as departure time of an employee or a student. The system uses a set of devices which determine the presence of the person during the marking of arrival as well as departure.*
***Keywords:** Raspberry Pi 3 Model B+, MiFare RFID Reader, NoIR Camera.*

I. INTRODUCTION

Nowadays, The registration of arrival time and departure time of a person at places such as schools, colleges or a corporate office is a very important thing many a times verbal use for marking an attendance or physically marking an attendance becomes a hectic task. Many a times, a person may also forget to mark his arrival or at times his departure. Hence, with this device we will try to overcome the issues of verbal use or physically marking the attendance of multiple people.

II. DESIGN OF ATTENDANCE SYSTEM

A. Selection of Components

To design such a system we are using Raspberry Pi 3 Model B+, a Mi Fare MFRC-555 RFID Reader and a NoIR canera.

B. Connecting Components to Raspberry Pi

The RFID reader will be connected to the GPIO ports of the Raspberry Pi and the Camera Module will be getting connected to the propritery camera slot of the Raspberry Pi Model 3 B+.

C. Fritzing Diagram

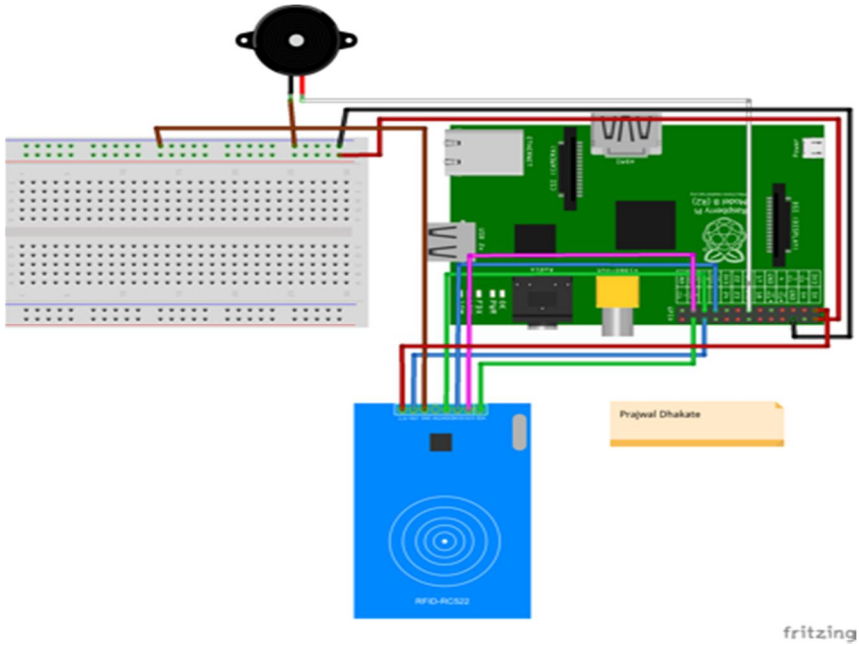

Fig 1: Fritzing diagram

D. Circuit Diagram

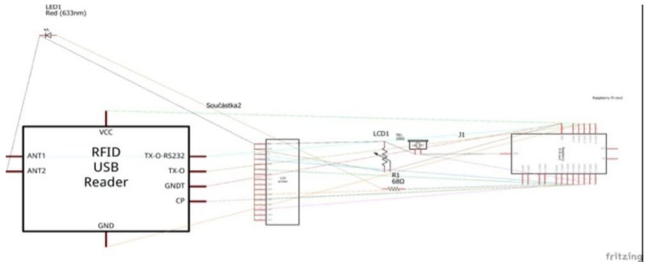

Fig 2: Circuit Diagram

III. BLOCK DIAGRAM

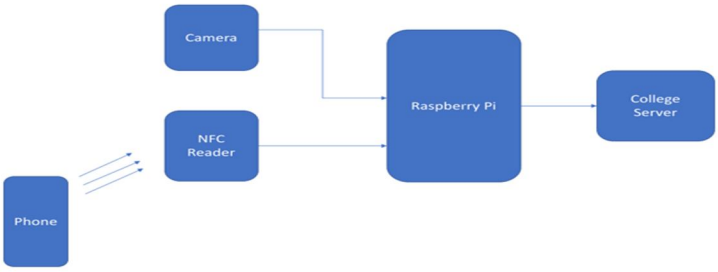

Fig 3: Block Diagram

IV. WORKING

The system works upon the RTC (Real Time Clock) meaning the system will mark attendance only when it s connected to the internet. This is done to avoid the chances of false attendance of a student or an employee. The system has a camera and a RFID Reader (which also acts as a NFC Tag Reader) which are connected to the Raspberry Pi. The Camera Module is connected to the Raspberry Pi and enable through the terminal using configuration command. Similarly, the RFID Tag Reader is connected to the Raspberry Pi through GPIO ports and is then enable through the terminal using configuration command. Firstly, the person will tap his Phone (which as NFC or has NFC Tag externally installed) to the RFID Reader. Then, after detecting the Tag the system will verify the Code of the particular tag with the database stored on the system. After, verifying the Tag the system will then enable the camera module to Capture the Face of the person marking the attendance which will then be compared to the image of the person stored on the database of the system. If the Tag and the Face are matched to that of the Data stored on to the database of the system then the attendance will be marked. The Facial recognition in the system will be acting as the Two Factor Authentication.

The Facial Recognition system will be verifying on multi Image basis meaning it will only mark the attendance of that person if and only if that person is present himself/herself. This is done by capturing multiple images of that person in various lighting conditions so to avoid false marking.

V. COMPONENT SPECIFICATION

A. Raspberry Pi 3 Model B+

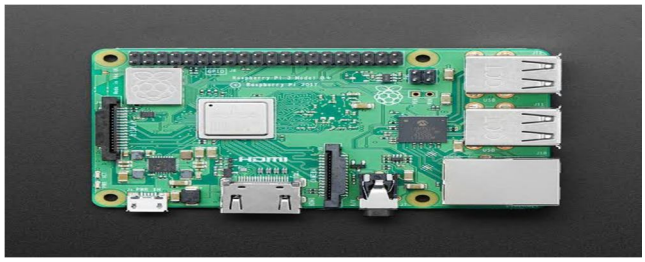

Fig 4: Raspberry Pi 3 Model B+

Table 1: Specification of Raspberry Pi 3 Model B+

No.	Components	Specification
1.	SoC	Broadcom BCM2837B0, Cortex-A53 (ARMv8) 64-bit SoC
2.	RAM	1GB LPDDR2 SDRAM
3.	Wireless Fidelity	Dual-band 802.11ac wireless LAN (2.4GHz and 5GHz)
4.	CPU	1.4GHz 64-bit quad-core ARM Cortex-A53 CPU
5.	Bluetooth	4.2
6.	Ethernet	Gigabit Ethernet over USB 2.0 (max 300 Mbps).Power-over-Ethernet support (with separate PoE HAT). Improved PXE network and USB mass-storage booting.
7.	Thermal Management	YES
8.	Video	Yes – VideoCore IV 3D. Full-size HDMI
9.	Audio	YE
10.	USB 2.0	4 ports
11.	GPIO	40- pin
12.	Power	5V/2.5A DC power input
13.	Operating system support:	Linux and Unix
14.	Read Range	5cm

B. MiFare RFID Reader (MFRC-555)

Fig 4: MiFare RFID Reader

Table 2: Specifications of MiFare RFID Reader

No.	Type	Specification
1.	Frequency	13.56 MHz
2.	Operating Voltage	2.5 - 3.3
3.	Communication	SPI, I2C protocol, UART
4.	Maximum Data Rate	10Mbps
5.	Current Consumption	13 - 26 mA
6.	Power down mode consumption	10uA (min)

C. NoIR Camera Raspberry Pi

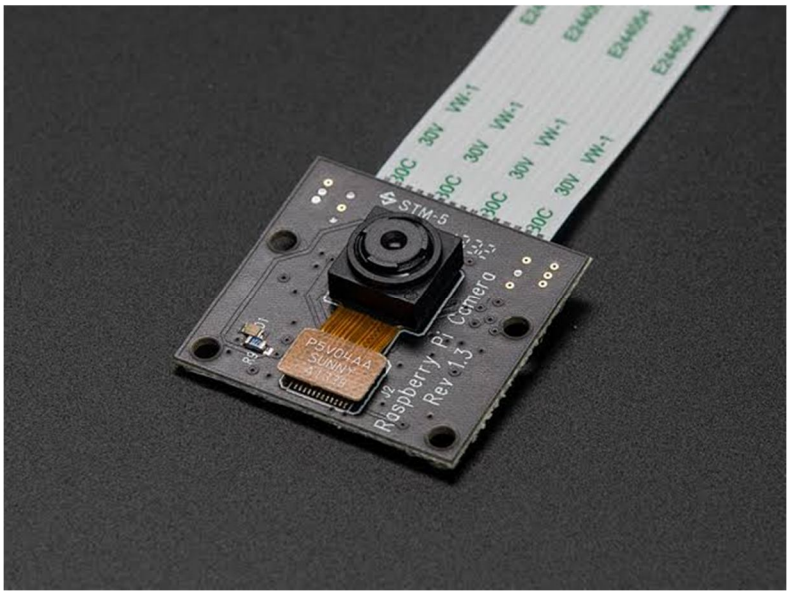

Fig 5: NoIR Camera Raspberry P

Table 3: Specifications of NoIR Camera for Raspberry PI

No.	Type	Specification
1.	Focus Type	Fixed focus lens on board
2.	Resolution	8 megapixel native resolution sensor-capable of 3280 x 2464 pixel static images.
3.	Support	1080p30, 720p60 and 640x480p90 video.
4.	Weight	3g
5.	Size	25mm x 23mm x 9mm.
6.	Connectivity	Connects to the Raspberry Pi board via a short ribbon cable (supplied)

VI. RESULT

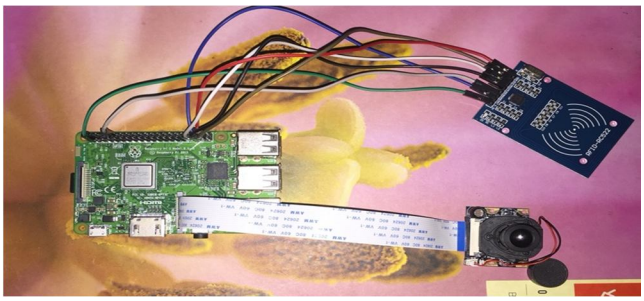

Fig 6: Circuit after making all the connections

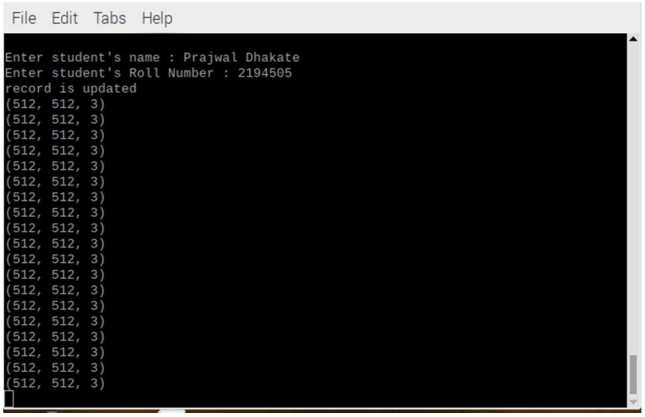

Fig 7: After Registering the NFC Tag of the Student with the system

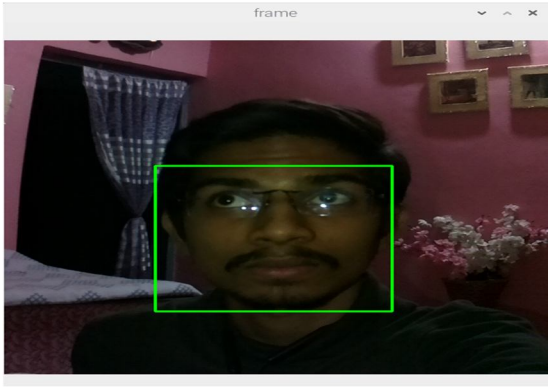

Fig 8: System Recognizing the Face and Registering it.

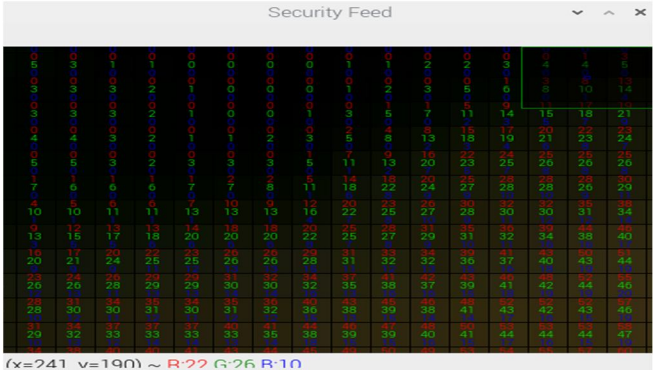

Fig 9: System Verifying the Face under various different lighting conditions.

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VII. CONCLUSION

This study helps in creating an effective solution for replacement of manual method of marking attendance with that automated smart system which would help decrease the rate of false attendance and also increase the rate of accuracy and help reduce the labour of the person assigned to mark the attendance. The diagrams shown in this paper are tested in real life college environment and have achieved to work flawlessly. The final attendance of the day is currently stored in the local storage of the system for testing purpose. The database whereas are stored on a cloud storage where the system will be able to match the facial biometrics as well as the Tag IDs to avoid hampering of the database. The database can only be accessed by an authorised personnel with his/her specific user ID and Password. The logs will also be stored by the system at times when the database is accessed or some changes have been made.

VIII. ACKNOWLEDGEMENT

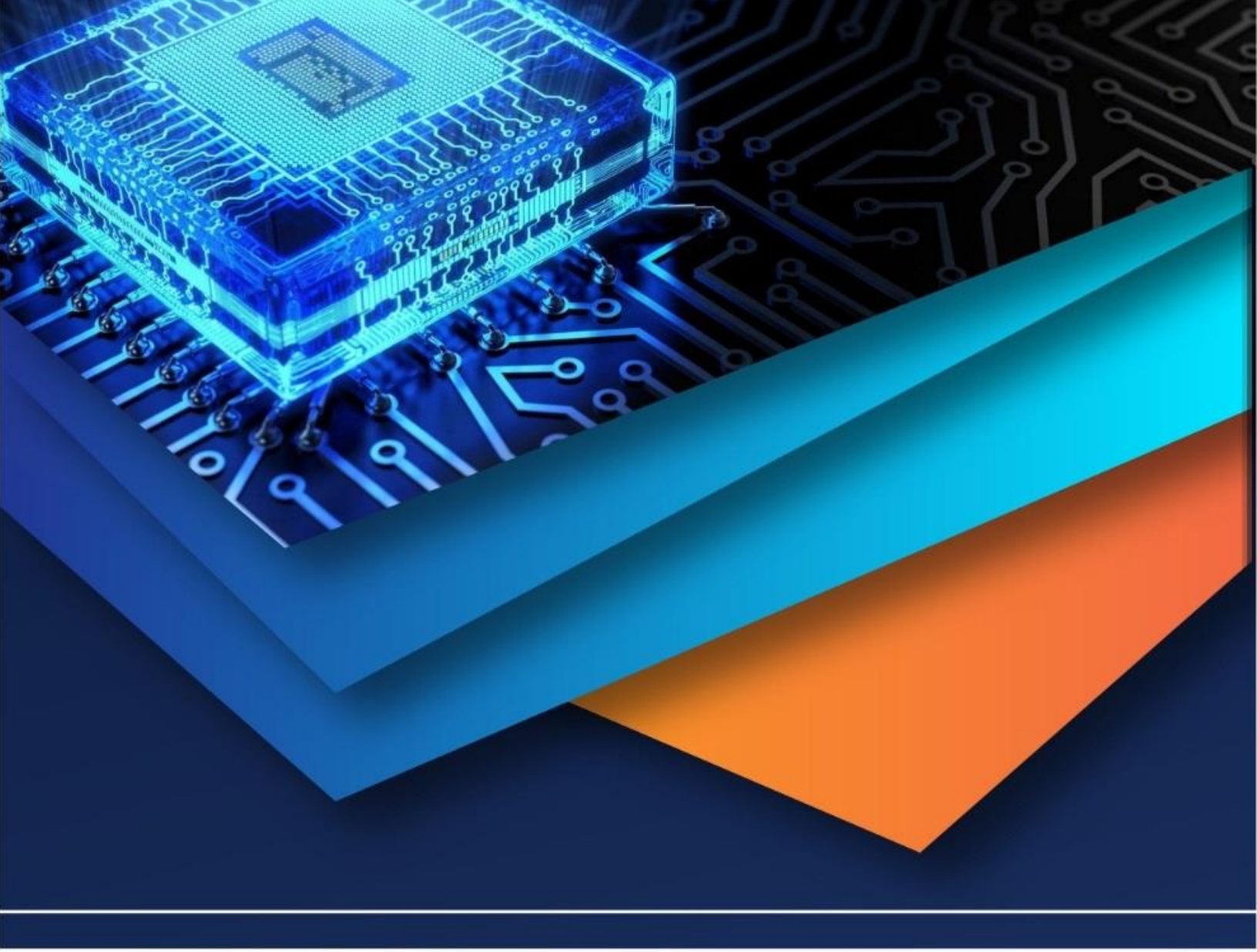
Getting a project done reflects the proverbial saying “Success is a marathon and not a sprint”. Dedication and perseverance when supported by inspiration and guidance leads to success. We’re highly indebted to Prof. Dr. Dhananjay Upasani & Prof. Mahesh Kamthe for their guidance and constant supervision as well as for providing necessary information regarding the project & also for their support in completing the Mini Project work. In true sense it was privilege for us to have him as our guide and we felt highly honoured working under him .Prof. (Dr.) V.V Shete, Head, Dept. of Electronics & Communication Engineering, has been a constant source of inspiration to us. Both are responsible for giving us the confidence and courage throughout execution.

We do not have words to express our sincere thanks to Prof. (Dr.) Kishore Ravande, Principal-MIT School of Engineering for their constant support and encouragement throughout the Mini Project work. We also acknowledge the help of family, friends and all those who have encouraged and helped us directly or indirectly with our work but whose contribution we may have failed to mention inadvertently.

REFERENCES

[1] Ishita Gupta; Varsha Patil; Chaitali Kadam; Shreya Dumbar; “Face Detection and Recognition using Raspberry Pi” Published in IEEE Xplore; DOI : 10.1109/WIECON-ECE.2016.8009092

[2] Hayder Fadhil Abdulsada; “Design and Implementation of Smart Attendance System based on Raspberry Pi”; Journal of Babylon University/Engineering Sciences/ No.(5)/ Vol.(25): 2017; pp : 1610-1617



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