

e-ISSN:2582-7219



# INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH IN SCIENCE, ENGINEERING AND TECHNOLOGY

Volume 7, Issue 9, September 2024



INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
INDIA

Impact Factor: 7.521



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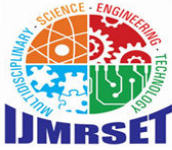
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## International Journal of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

# Wi-Fi Door Lock Using ESP32 Cam & Telegram

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**ABSTRACT:** The system employs a secure and user-friendly approach to enhance door access and security in the modern age of IoT. The system uses an ESP32- CAM module to capture and stream real-time video from the door, allowing users to visually verify visitors via a smartphone or computer. It utilizes secure Wi-Fi communication to ensure data integrity and privacy. The Telegram application serves as the control interface, enabling users to remotely lock and unlock the door using their smartphones, tablets, or computers. Access is granted only to authorized individuals, enhancing security. This solution is cost-effective and easily deployable, making it accessible to a wide range of users. It offers convenience, security, and peace of mind by innovatively leveraging existing technologies. In conclusion, the Wi-Fi Door Lock System with ESP32-CAM and Telegram integration is a smart, efficient, and secure solution for modern door access control and monitoring, catering to the growing demand for IoT-based home security systems. Telegram for remote control and monitoring One of the key strengths of this solution lies in its cost-effectiveness and ease of deployment. By leveraging existing technologies in innovative ways, the system minimizes the barriers to entry for users, making advanced home security accessible to a wide range of individuals. In summary, the wi-fi door Lock System with ESP32-CAM and Telegram integration represents a smart, efficient, and secure solution for modern door access control and monitoring. By catering to the growing demand for IoT-based home security systems, this innovative solution delivers unparalleled convenience, security, and peace of mind to users worldwide.

## I. INTRODUCTION

This project aims to enhance door security by allowing users to remotely lock and unlock their doors, verify visitors through real-time video streaming, and ensure that only authorized individuals have access. It strives to be a cost-effective and user-friendly solution that can be easily adopted by a wide user base. The project will focus on seamless integration between the ESP32-CAM module and Telegram, implementing robust security measures to protect data transmission, and ensuring the system's reliability and expandability for potential future enhancements or integrations with other smart home devices. Ultimately, this project seeks to offer a practical and secure solution that caters to the growing demand for IoT-based home security systems.

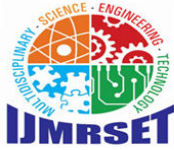
## II. METHODOLOGY

### A. ABOUT THE PROJECT

About the Project "Wi-Fi Door Lock using ESP32-CAM using Telegram" project is a cutting-edge home. The security system that combines an ESP32-CAM module with the Telegram messaging app. Its primary objective is to enhance door security and enable remote control and monitoring. The ESP32- CAM captures live video of the door area, accessible through Telegram, allowing users to visually confirm visitors before granting access. Telegram serves as the control interface, enabling secure door locking or unlocking from anywhere with internet connectivity.

### B. SCOPE OF THE PROJECT

The scope of the Wi-Fi Door Lock System project with ESP32-CAM and Telegram integration encompasses the development and implementation of a modern access control solution that leverages Internet of Things (IoT)



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technologies. This project aims to enhance door security and user convenience by allowing remote locking and unlocking of doors through a user-friendly interface on the Telegram app. The system utilizes the ESP32-CAM module for real-time video streaming, enabling users to visually verify visitors before granting access, thus improving security measures.

### C. APPLICATION OF PROJECT

Project has versatile applications in residential, commercial, and even shared spaces. It offers convenient and secure access control, allowing homeowners to remotely manage their door locks, verify visitors, and grant access to trusted individuals. The project focuses on real-time video streaming for visitor verification, user authentication for access control, and robust data security measures.

### D. EXISTING SYSTEM

Users are required to physically insert a key into the lock to open or lock the door, which can be inconvenient and pose security challenges if keys are lost or stolen. Some existing systems may also include basic keyless entry options using PIN codes or RFID cards, but they often lack remote access and monitoring capabilities. In contrast to the "WiFi Door Lock using

ESP32-CAM using Telegram" project, traditional door lock systems lack the integration of IoT technologies and mobile applications like Telegram for remote control and real-time video verification of visitors. The project aims to modernize door access control by providing a more user-friendly, secure, and convenient solution, especially suitable for today's connected homes and businesses.

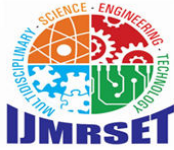
### E. PROPOSED SYSTEM

It seamlessly integrates the ESP32-CAM module with the Telegram messaging app to provide remote control and monitoring. Users can securely lock or unlock their doors from anywhere, aided by real-time video verification through the ESP32-CAM. A robust user.

## III. USAGE

The Door plays an important role in home security. To secure the house, the occupants of the house will always have the door locked. However, sometimes the house occupants forget to lock the door due to hurry when leaving the house, or they may doubt whether they have locked the door or not. We propose an application called Door Security System which is based on Android using Internet of Things (IoT) technology to monitor the status of the door, controlling the door and increasing security in a house. MQTT cloud is utilized as the communication protocol between smartphone and door lock system. PIR sensor is implemented in the door lock to detect the movement near the door, while touch sensor is installed on the door handle to recognize the human hand. Should the door is opened by force, the alarm will ring and send notification to alert the house occupant on the existence of intruder in the house. The evaluation results show that motion detection sensor can detect movement accurately up to 1.6 meters ahead, and messages published between smartphone and door lock are encrypted properly so messages are safely sent. This Face detection are utilized in smartphones in past few years. It's a cool technology where we will unlock mobile phones or access any application that needs high security. With ESP-32 CAM, we will try to develop an easy project that uses our face as an ID. As the ESP32 board comes with a Camera Web Server example code that is used for video stream and face detection. During this ESP-32 cam project, we've made a Face Detection Door Lock System

using ESP32-CAM. When the smart lock detects any enrolled face, it automatically works. So, this is often an easy but very useful home automation project using ESP-32 CAM module. Information gathered from the face helps people understand others identities. During this face detection approach, a given face is necessarily compared with the authorized faces to spot the right person. With in the field of bioscience, face recognition technology is one of the fastest-growing fields.



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### IV. FEATURES

- **Remote Control:** Users can conveniently lock or unlock their doors using the Telegram app, which enhances access management flexibility. This feature allows for quick responses to access requests without needing to be physically present at the location.
- **Real-Time Video Verification:** The system integrates live video streaming capabilities through the ESP32-CAM, enabling users to visually confirm the identity of visitors before granting them access. This adds an extra layer of security by allowing users to see who is at their door in real-time.
- **User Authentication:** A secure authentication mechanism is in place to ensure that only authorized individuals can control the door lock. This is crucial for maintaining the integrity of the security system.
- **Data Security:** The system employs robust security measures and encryption protocols to protect data transmission. This ensures user privacy and prevents unauthorized access, making the system reliable for sensitive applications.
- **Additional Insights :** The integration of these features not only enhances security but also provides significant convenience for users. With the ability to manage access remotely and verify visitors through video, users can feel more secure in their environments. The combination of user authentication and data security measures further solidifies the system's reliability, making it a modern solution for access control challenges.

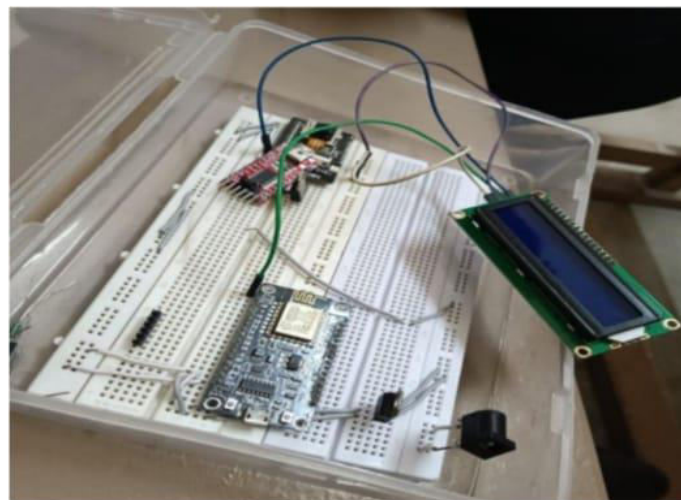
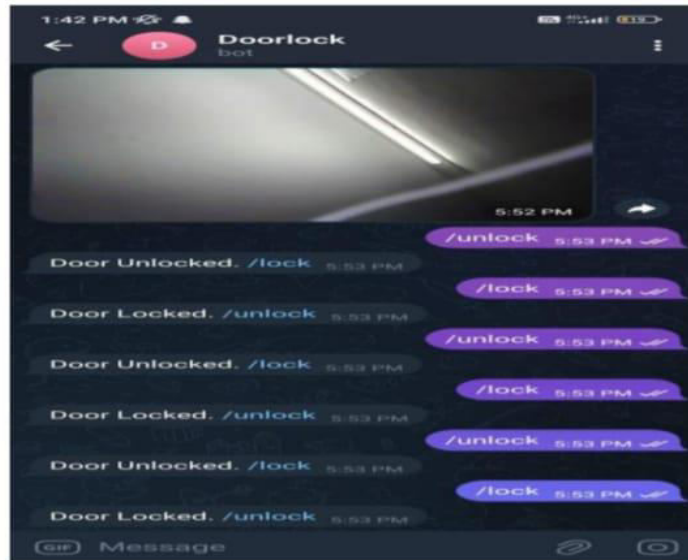
### V. RESULT AND DISCUSSION

The proposed system was developed using ESP 32 cam . At first, a door only requires a physical key to lock or unlock the door but on the other hand, with the advancement of technology, a more modern door has been innovated, namely the digital door which will lock or unlock doors without requiring any physical key. We propose an application called Face detection Door Lock. which is predicated on Arduino using the Internet of Things (IoT) technology to watch the status of the door, control the door, and increase security. By the use of an ESP32 cam, the door will lock or unlock automatically.



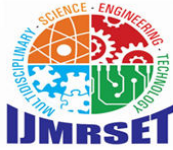
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### VI. CONCLUSION

*In this project we successfully developed an ESP32 Cam Face Detection Door lock system that monitors the status of the door and boosts home security. The System that we are working on is very easily managed and completed so we come to the conclusion part. Here we developed a surveillance and security-based system through this we can avoid unauthorized break-ins and prevention from theft. It can be done by its ESP32 CAM face which is used for capturing the images of an individual to open the door lock. CCTV is such a lot popular lately, it only provides surveillance facilities but here we will control the break-ins and provide a far better security platform (I.e., door lock after the facerecognition) looking at today's scenario where people avoid physical contact due to Co-VID19, it's also very helpful and needed at this point for the precaution of an individual. By this technique, we'll reduce the physical contact, cost and also man power required for safety purposes. Little or no coding is required and one can get a system up and running in very less time*



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### VII. FUTURE WORK

- We Will create separate android app for our project instead of using telegram bot.
- We add Finger Sensor in the project
- Incorporate a battery backup system to ensure continuous operation in the event of a power outage, as well as redundant communication channels (e.g., cellular backup) to maintain connectivity in case of WiFi network failure
- Implement multi-factor authentication protocols to add an extra layer of security, combining something the user knows (password), something they have (smartphone), and something they are (biometric).
- Implementing mechanisms within the Android app to gather user feedback, suggestions, and bug reports. Additionally, providing comprehensive user support resources such as FAQs, tutorials, and troubleshooting guides to assist users in effectively using the door lock system.
- Designing a user-friendly interface for the Android app that allows for easy navigation and control of the door lock system features. This could include intuitive buttons for locking/unlocking the door, accessing video streams, and managing user permissions

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