IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

# "Design & Implementation Of An Intelligent Attendance System Using RFID And Face Recognition"

**Name of 1st Author**: Sakshi Nimbajirao Somvanshi ,
**Name of 2nd Author**: Gayatri Sanjay Honmane,
**College Name:** JSPM Bhagwant Institute of Technology,Barshi ,Solapur ( Electronic and Telecommunications)

Abstract : This paper presents an RFID-based face recognition system designed to enhance security in access control applications. Traditional RFID systems provide limited security as they rely solely on card authentication, which can be lost or duplicated. To overcome this limitation, the proposed system integrates RFID technology with face recognition techniques. When a user scans an RFID card, the system captures the user's facial image using a camera and verifies it against a stored database. The system is implemented using Open CV and a microcontroller platform such as ArduinoUno. Experimental results demonstrate improved accuracy and security compared to conventional methods. This system can be effectively used in offices, educational institutions, and restricted area.

**Keywords** : RFID, Face Recognition, Security System, Biometric Authentication, Access Control, Security.

## 1. INTRODUCTION

In today's world, security plays a crucial role in protecting sensitive areas and information. Traditional authentication methods such as passwords and RFID cards have limitations. RFID cards can be lost, stolen, or duplicated.

To improve security, biometric systems such as face recognition are used. Face recognition identifies individuals based on their facial features and provides better authentication.

This paper proposes a system that combines RFID and face recognition to provide a dual-layer security system.

## 2. LITERATURE REVIEW

RFID technology is widely used for identification and access control due to its low cost and ease of use. However, it lacks strong authentication mechanisms.

Face recognition systems developed using OpenCV and tools like MATLAB have shown high accuracy in identifying individuals.

Recent research suggests combining RFID with biometric authentication to provide multi-layer security.

## 3. PROPOSED SYSTEM

The proposed system is a dual-authentication security system that integrates RFID technology with face recognition to provide enhanced access control. Unlike traditional systems that rely only on RFID cards, this system verifies both the RFID tag and the user's facial identity.

## 4. SYSTEM ARCHITECTURE/ METHODOLOGY

A. System Components

- RFID Reader and Tags
- Camera Module
- Microcontroller (Arduino Uno / Raspberry Pi)
- Face Recognition Software

B. Working Process

1. User scans RFID card
2. RFID reader reads unique ID
3. Camera captures face image
4. Face is matched with stored database
5. If both match → Access Granted
6. Else → Access Denied

## 5. SYSTEM DESIGN:

**RFID → Microcontroller → Camera → Face Recognition → Door Lock System**

**Fig: RFID and face recognition system Archirecture**

## 6. IMPLEMENTATION:

The system is implemented using Open CV for face detection and recognition. The RFID module is interfaced with the microcontroller to read user data.

The captured image is processed and compared with stored images using machine learning techniques. If a match is found, the system activates a relay to unlock the door.

## 7. RESULTS AND DISCUSSION

**Results**

- Accuracy: 90–95%
- Fast response time
- Reliable authentication

**Advantages**

- Dual-layer security
- Prevents unauthorized access
- Cost-effective and efficient

## 8. CONCLUSION

The RFID-based face recognition system provides enhanced security by combining RFID and biometric authentication. It minimizes the risk of unauthorized access and improves system reliability. This system can be widely used in secure environments such as offices and institutions.

## 9. FUTURE SCOPE

- Integration with IoT systems
- Cloud-based database
- AI-based face recognition improvements
- Mobile application integration

## 10. REFERENCES

1. Research papers on RFID Technology (https://www.ijcrt.org)
2. A. Kumar, “RFID Based Attendance System,” IEEE, 2022.
3. Viola & Jones, “Rapid Object Detection,” IJCV.