



# Secure Cardless ATM Access Using Face Recognition and PIN Authentication

Done By

TADIVADA DEEPTHI, VADDIKEERTHIKA, BANTUREVANTH,

VANKADONI, NIKKALAGANESH

Students of Visakha Institute of Engineering & Technology Computer Science

Engineering

Visakhapatnam, Andhra Pradesh Under Guidance of

M.USHAM.TECH(PH.D)

Visakha Institute of Engineering & Technology Faculty of Computer Science Engineering Visakhapatnam, Andhra Pradesh

**1. Abstract:** Automated Teller Machines (ATMs) have revolutionized banking services by providing customers with easy access to financial transactions such as cash withdrawals, fund transfers, and account inquiries. However, traditional ATM systems primarily rely on PIN-based authentication, which is susceptible to fraud and unauthorized access. To enhance security and reduce fraudulent activities, this research proposes a biometric authentication-based ATM system that integrates face recognition with PIN authentication. If authentication fails multiple times, the system will log and report invalid access attempts to law enforcement agencies. This paper discusses the design, implementation, and security benefits of integrating face recognition technology into ATM transactions.

**2. Introduction:** ATMs are an essential part of modern banking infrastructure, offering 24/7 access to financial services. However, ATM fraud, including card skimming, shoulder surfing, and PIN theft, poses significant security challenges. Traditional PIN-based authentication is vulnerable to hacking and theft, leading to unauthorized transactions. The proposed system aims to enhance ATM security by implementing face recognition as an additional layer of authentication.

**3. Literature Review** Existing ATM security measures include PIN authentication, biometric methods (such as fingerprint recognition), and one-time passwords (OTPs). While biometric methods offer increased security, they are not foolproof. Face recognition is emerging as a secure and user-friendly authentication technique, reducing dependency on PIN-based authentication alone.

## System Design and Architecture

The proposed ATM security system consists of:

- **Face Recognition Module:** Captures and verifies the user's facial features using deep learning-based algorithms.
- **PIN Authentication:** Provides an additional layer of security to verify the legitimate user.
- **Invalid Access Logging and Reporting:** If multiple authentication attempts fail, the system logs unauthorized access attempts and reports them to police offices for further action.

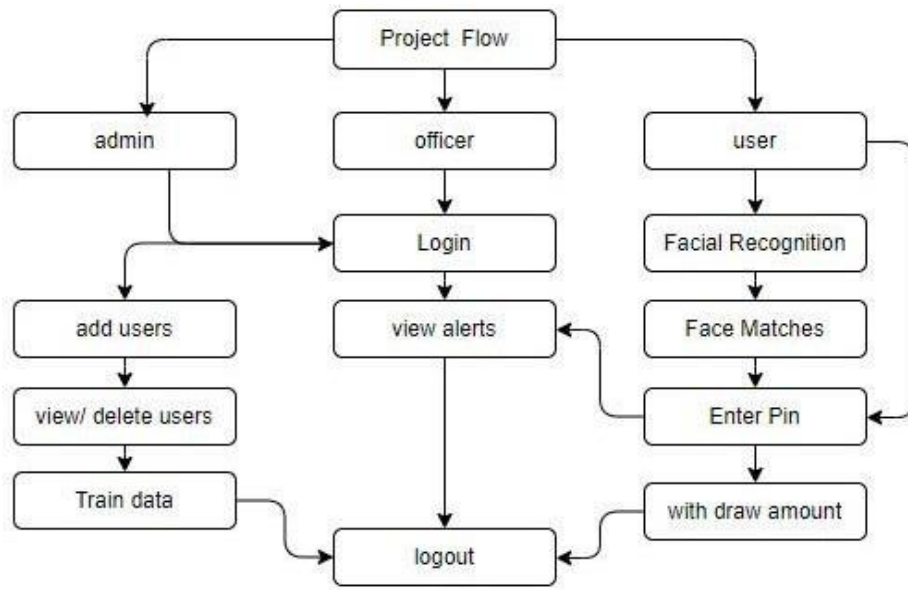
## 4. Hardware Requirements

Processor	-I3/Intel Processor
HardDisk	-160GB
KeyBoard	-Standard Windows Keyboard
Mouse	-Two or Three Button Mouse
Monitor	-SVGA
RAM	-8GB

## 5. Software Requirements:

Operating System	: Windows 7/8/10
Server side Script	: HTML, CSS, Bootstrap & JS
Programming Language	: Python
Libraries	: Django, Pandas, Os
IDE/Workbench	: PyCharm, VSCode
Technology	: Python 3.6+

### 6. BLOCKDIAGRAM:



### 7. UMLDiagrams:

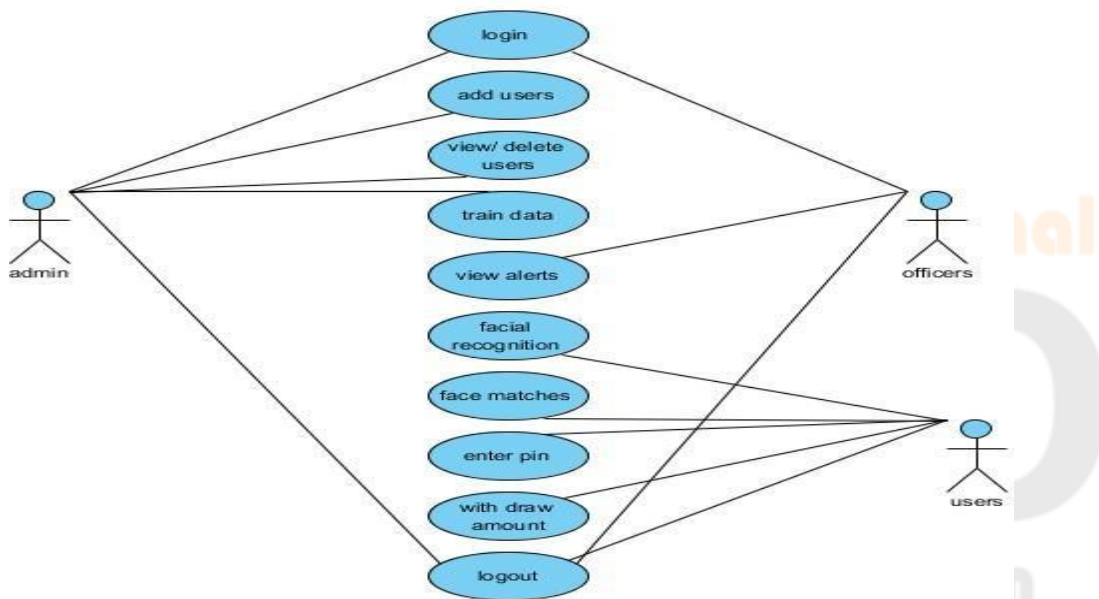
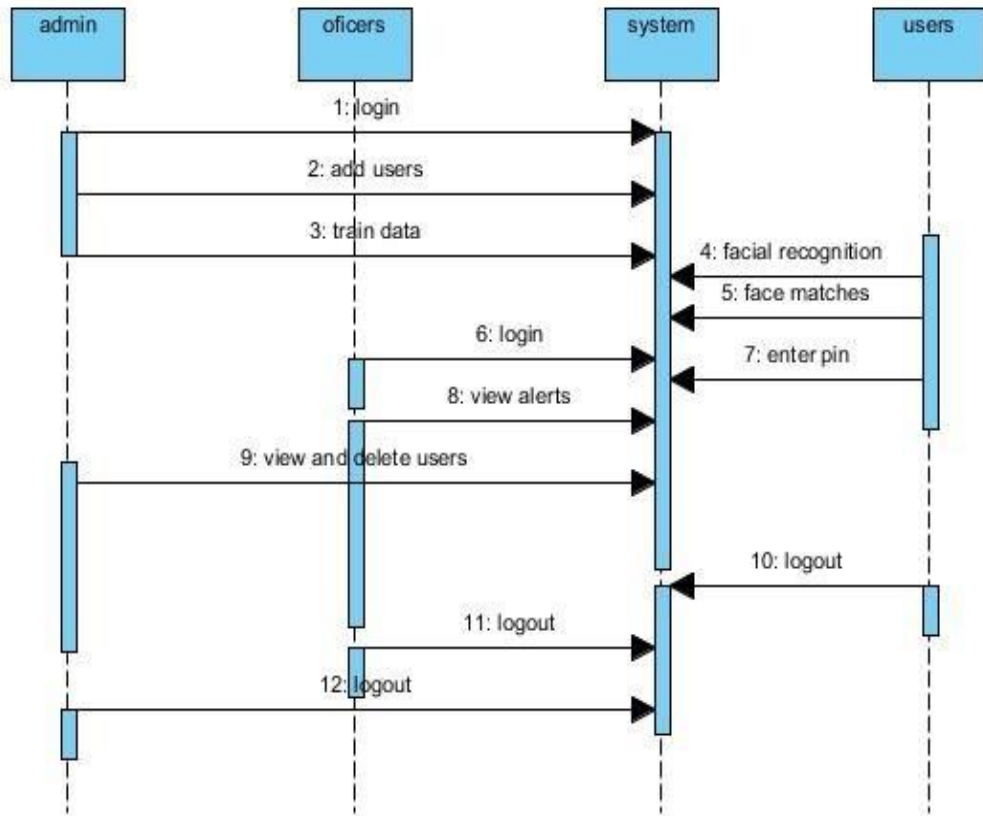
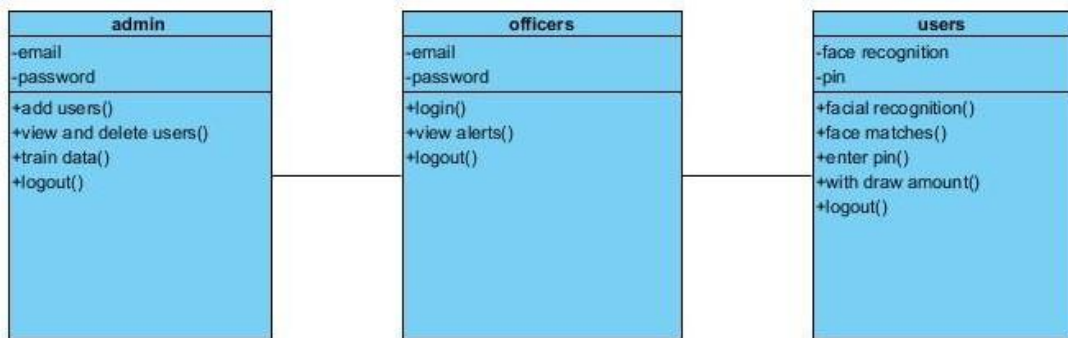


Figure:7.1 Use Case Diagram



**Figure:7.2SequenceDiagram**



**Figure:7.3ClassDiagram**

### DeploymentDiagram:



Figure:7.4DeploymentDiagram Implementation

### Methodology

#### 1. FaceRecognitionProcess:

- A high-resolution camera captures the user's face. Facial features are extracted and compared with the stored database using AI-driven algorithms.
- If face recognition is successful, the user proceeds to PIN authentication.

#### 2. PINAuthenticationProcess:

- The user enters their PIN.
- If the PIN is correct, the transaction proceeds. ○ If the PIN is incorrect, the system allows a limited number of retries before locking the account.

#### 3. SecurityandFraudPreventionMeasures:

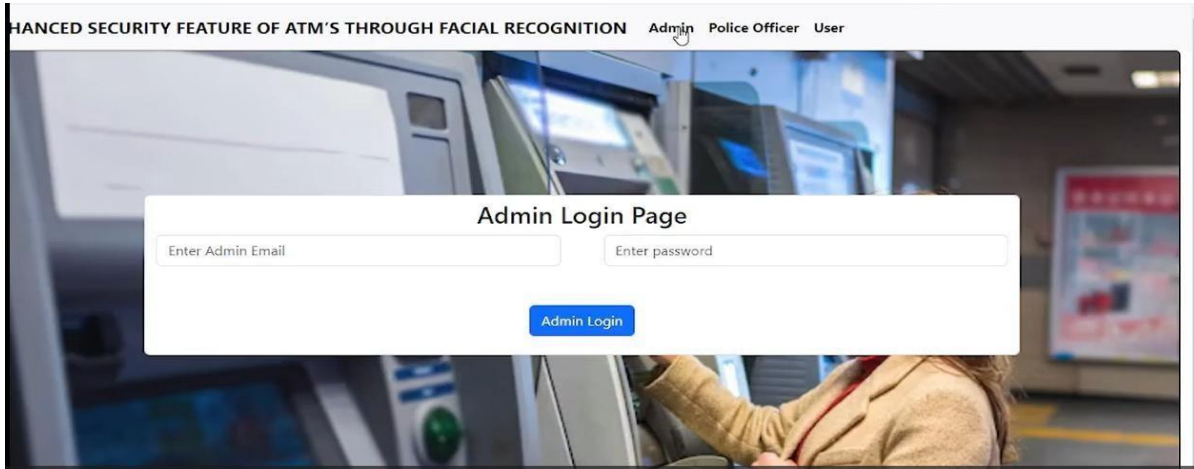
- If face recognition fails multiple times, an alert is generated. ○ If repeated invalid PIN attempts occur, the system logs the event and alerts law enforcement agencies.
- Integration with banking security databases enhances fraud detection.

### AdvantagesoftheProposedSystem

- **EnhancedSecurity:** Dual authentication significantly reduces fraud risk.
- **FraudPrevention:** Reporting invalid attempts to authorities aids in preventing potential crimes.
- **UserConvenience:** Contactless authentication improves user experience and transaction speed.

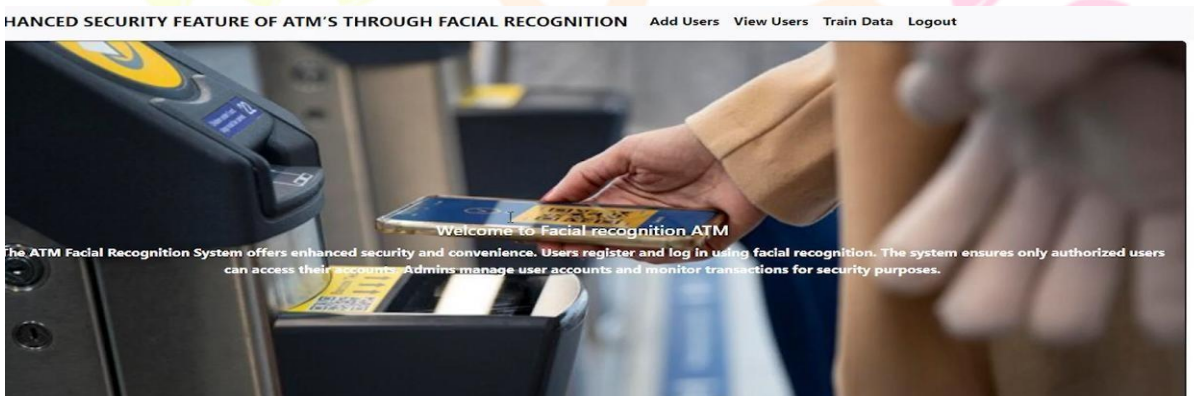
## RESULT:

### STEP1:



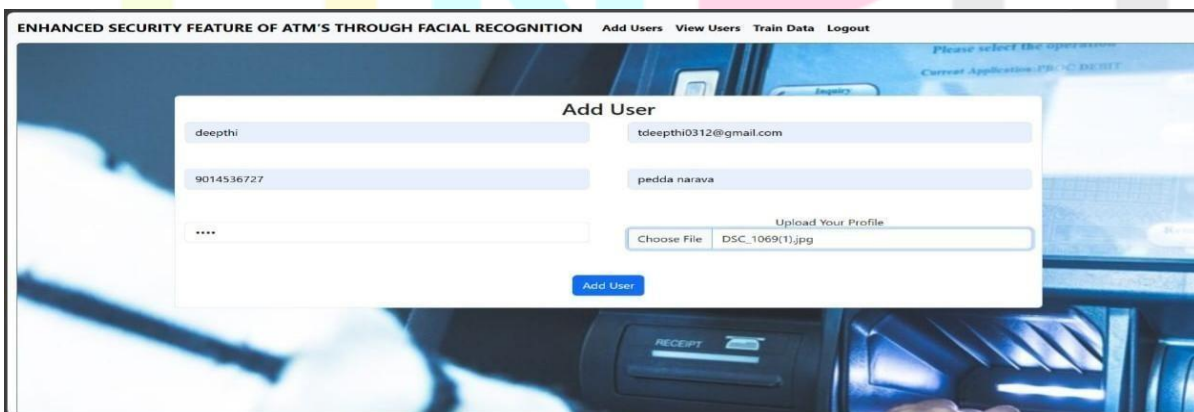
**Figure8.1AdminLoginInterface**

### STEP2:



**Figure8.2MainInterface**

### STEP:3



**Figure8.3AddingUserInterface**

STEP:4

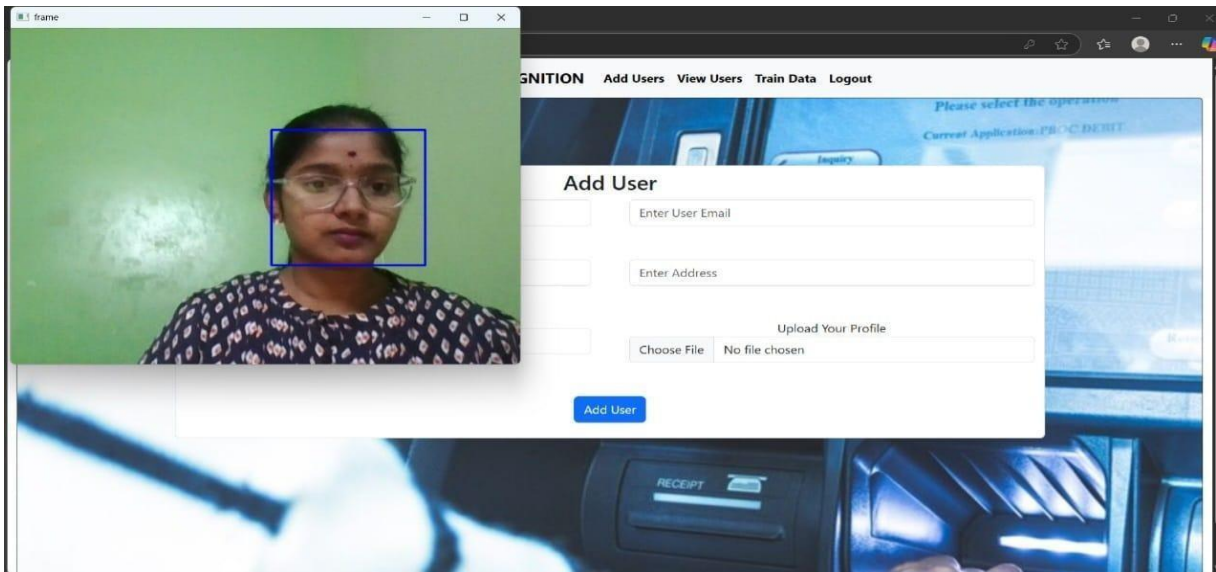


Figure8.4UserImageCapturing

STEP:5



Figure8.5ViewUsers

STEP:6

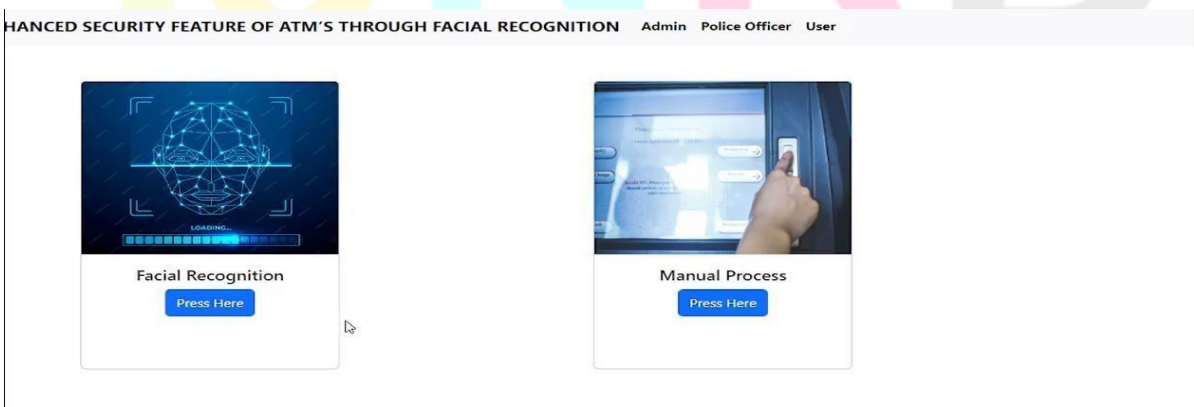


Figure8.6TwoStepAuthentication

STEP:7



Figure8.7UserLogin

STEP:8

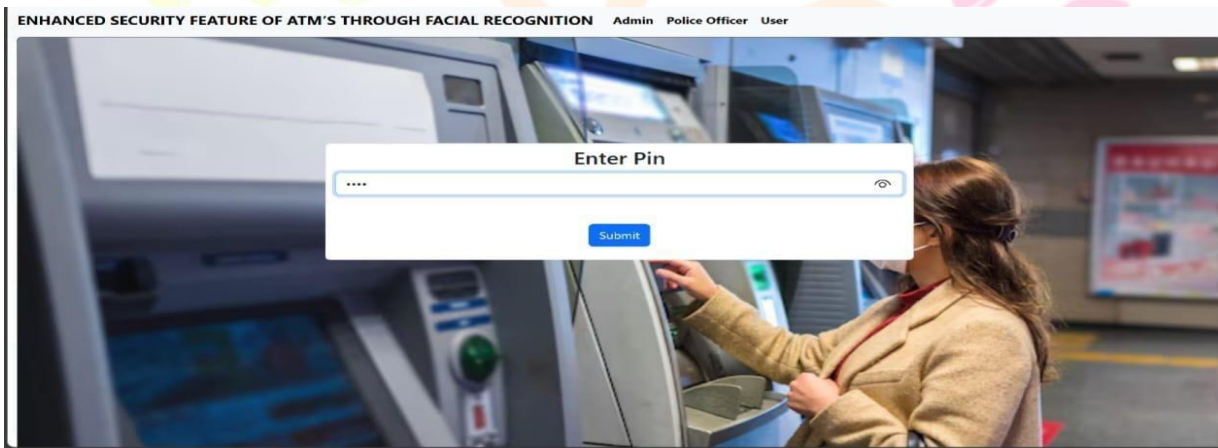


Figure8.8EnterPin

STEP:9



Figure8.9AccountOverview

STEP:10



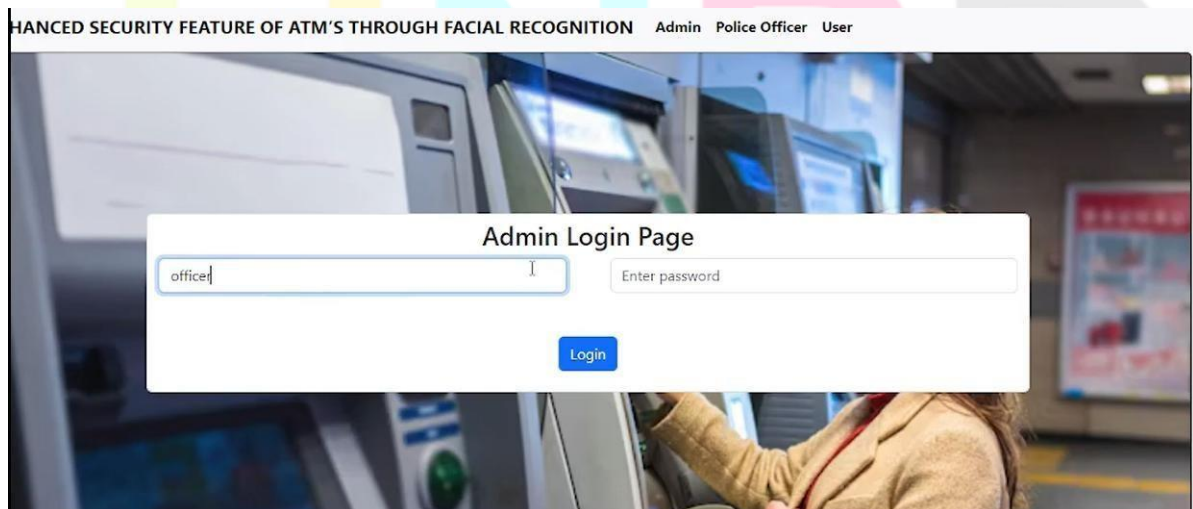
Figure8.10ProfileofUserAfterAuthentication

STEP:11



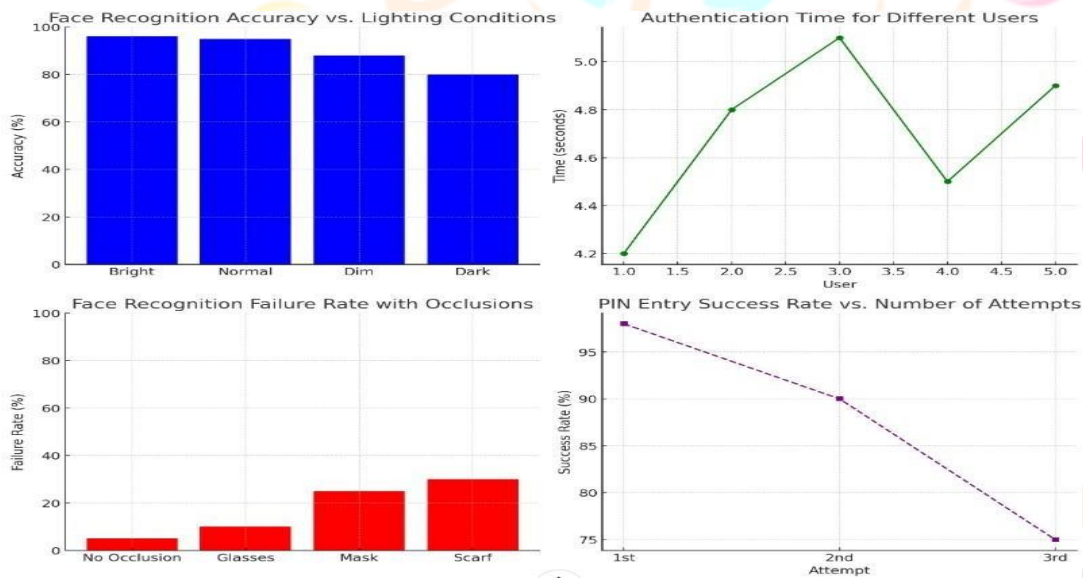
Figure8.11InvalidPinifEnter

STEP:12



**Here are a few graphs that would be useful for analysing the performance of our Secure Cardless ATM Access Using Face Recognition and PIN Authentication system:**

1. Face Recognition Accuracy vs. Lighting Conditions
2. Authentication Time for Different Users
3. Failure Rate of Face Recognition with Occlusions
4. PIN Entry Success Rate vs. Number of Attempts



**Figure 8.12 GRAPH ANALYSES**

**9. CONCLUSION:** Integrating face recognition with PIN authentication enhances ATM security by mitigating risks associated with PIN-only systems. The proposed system provides a robust, user-friendly, and secure solution for banking transactions while ensuring prompt reporting of unauthorized access attempts to law enforcement agencies. This dual-layer authentication approach significantly improves the security and reliability of ATM transactions.

**10. Keywords:** ATM Security, Face Recognition, PIN Authentication, Biometric Security, Fraud Prevention, Banking Security Systems.

## 11. REFERENCES:

- 1 Chaudhary, S., Singh, S., & Sharma, A. (2017). Enhancing ATM Security Using Biometric Technology. *International Journal of Computer Applications*, 171(2), 18-21.
- 2 Jain, R., Upadhyay, S., & Shukla, S. (2019). Biometric Authentication Systems for ATM Security: A Review. *International Journal of Advanced Research in Computer Science*, 10(1), 339-344.
- 3 Patel, V., Prajapati, R., & Patel, D. (2020). Face Recognition Technology for ATM Security: A Review. *International Journal of Innovative Technology and Exploring Engineering*, 9(2), 1715-1718.
- 4 Singh, S. K., Singh, A. K., & Roy, N. K. (2018). Biometric Authentication in ATM Banking: A Survey. *International Journal of Computer Applications*, 179(11), 14-19.
- 5 Yadav, A., Bhadauria, S., & Srivastava, A. (2017). A Comprehensive Review on ATM Security Using Biometrics. *International Journal of Computer Sciences and Engineering*, 5(11), 199-204.
- 6 Jain, A., & Ross, A. (2012). *Handbook of Biometrics*. Springer Science & Business Media.
- 7 Gupta, S., Vishwakarma, S. K., & Singh, A. K. (2016). Biometric Based ATM Cash Withdrawal System: A Review. *International Journal of Computer Applications*, 139(6), 24-27.
- 8 Khedkar, A., Agrawal, D., & Khandelwal, K. (2018). Security Issues in ATM Transaction Using Biometric Authentication. *International Journal of Computer Applications*, 182(10), 20-23.
- 9 Afolabi, I. T., & Osunmakinde, I. O. (2020). Biometric Authentication in Enhancing ATM Security: A Review. *Journal of Computer Science and Its Application*, 27(1), 1-14.
- 10 Jain, A. K., Ross, A., & Nandakumar, K. (2011). *Introduction to Biometrics*. Springer Science & Business Media.

LINKSOF THEREFERENCES:

1. <https://www.ijarsct.co.in/Paper18565.pdf>
2. <https://link.springer.com/book/10.1007/978-0-387-77326-1>
3. <https://content.e-bookshelf.de/media/reading/L-1927-957d45a798.pdf>
4. <https://www.ijarsct.co.in/Paper18565.pdf>

