

Smart Visitor Intelligent Management System using AI, Aadhaar Verification, Face Recognition and Trust Scoring

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1. Abstract—

Traditional visitor management systems rely on manual logbooks and basic digital entry methods, which are time-consuming, error-prone, and lack intelligent monitoring capabilities [1], [2]. Existing systems mainly focus on visitor registration and identity verification without providing predictive security or behavioral analysis [6]. Recent advancements in artificial intelligence and face recognition technologies have improved authentication accuracy and automated monitoring [3], [4].

This paper proposes a **Smart Visitor Intelligent Management System** that integrates face recognition, Aadhaar-based verification, QR-based authentication, and an AI-based trust scoring mechanism. The system automates visitor entry, enhances identity validation, and improves organizational security through intelligent behavior analysis. Deep learning-based face recognition improves authentication reliability and reduces unauthorized access [13], [15].

Experimental analysis based on processing time, authentication accuracy, and security efficiency indicates that the proposed system performs better than traditional visitor management approaches [1], [3]. The solution is scalable, software-based, and suitable for deployment in offices, colleges, police stations, and government organizations. Overall, the proposed system provides a secure, intelligent, and efficient visitor management solution for modern organizations.

In conclusion, the integration of AI-based trust analysis with secure identity verification transforms traditional visitor management into an intelligent and predictive security system.

2. Keywords—

Visitor Management System, Artificial Intelligence, Aadhaar Verification, Face Recognition, Trust Score, Security.

3. Introduction

3.1 Background of the Topic

Visitor management systems are essential for maintaining security, monitoring visitor activities, and managing organizational access. Traditional systems mainly rely on manual logbooks and basic digital entry methods, which are inefficient, time-consuming, and prone to human errors [1], [2]. With the advancement of artificial intelligence, cloud computing, and biometric technologies, modern visitor management systems have evolved toward automated and intelligent security solutions [6], [21].

3.2 Importance of the Problem

Organizations such as corporate offices, educational institutions, government buildings, and police stations require secure and efficient visitor management to prevent unauthorized access and improve monitoring capabilities. Conventional systems lack real-time analysis, intelligent authentication, and predictive security mechanisms [4], [7]. As security threats continue to increase, there is a growing need for systems that can provide reliable identity verification and intelligent visitor analysis [9], [13].

3.3 Existing Issues

Although several digital visitor management systems have been developed, many existing solutions focus only on visitor registration and identity verification [2], [5]. Current systems still face challenges such as:

- Lack of intelligent behavioral analysis
- Limited predictive security mechanisms
- Dependence on manual verification in some cases
- Possibility of fake identity access and unauthorized entry [7], [11]

Additionally, traditional face recognition systems may experience reduced accuracy under varying environmental conditions [12], [20].

3.4 Objective of the Project

The main objective of this project is to develop a **Smart Visitor Intelligent Management System** that enhances organizational security using AI-based technologies. The proposed system integrates:

- Face recognition for secure authentication [3], [15]
- Aadhaar-based verification for reliable identity validation [7]
- QR-based visitor entry and exit management
- AI-based trust scoring for predictive security and behavioral analysis

The system aims to improve visitor monitoring, reduce processing time, enhance authentication accuracy, and provide intelligent decision-making capabilities.

4. Literature Review

The evolution of visitor management systems has progressed from manual record-keeping to intelligent, AI-driven solutions. This section reviews existing research in the domains of digital visitor systems, face recognition, artificial intelligence, and identity verification.

4.1 Traditional and Digital Visitor Management Systems

Early visitor management systems relied on **manual logbooks** to record visitor details such as name, purpose, and entry time. These systems were inefficient, error-prone, and lacked real-time monitoring capabilities [1].

To overcome these limitations, digital visitor management systems were introduced. Studies show that replacing manual logbooks with digital systems significantly improves operational efficiency and reduces errors [1], [2].

However, these systems primarily focus on digitization and data storage without incorporating intelligent decision-making or automation.

4.2 Face Recognition-Based Visitor Systems

With the advancement of computer vision, **face recognition technology** has been widely adopted for visitor authentication. These systems automate identity verification by capturing and comparing facial features in real time, thereby reducing human intervention and improving security [4], [9].

Modern systems use deep learning techniques such as **Convolutional Neural Networks (CNNs)** to enhance recognition accuracy and robustness [3], [15], [18].

Additionally, real-time face recognition systems provide improved authentication performance and enable automated logging of visitor activities [10].

4.3 AI-Based Intelligent Visitor Management Systems

Artificial Intelligence (AI) has significantly enhanced visitor management by enabling automation, analytics, and intelligent decision-making.

Recent research integrates **AI with cloud and edge computing**, allowing real-time processing and scalable system design [6]. These systems improve responsiveness and enable continuous monitoring of visitor activities.

AI-based visitor systems also support **real-time authentication, automated logging, and alert generation**, reducing manual workload and improving system efficiency [5], [6].

4.4 Aadhaar-Based Identity Verification Systems

Secure identity verification is a critical requirement in modern visitor management systems. In this context, **Aadhaar-based authentication** has emerged as a reliable solution.

Research shows that integrating Aadhaar OTP verification enhances identity validation and reduces fraudulent access [7], [11]. When combined with biometric systems such as face recognition, it provides a robust multi-level security framework [7].

However, these systems mainly focus on identity verification and lack behavioral intelligence.

4.5 Limitations of Existing Systems

Despite significant advancements, existing systems have several limitations:

- Most systems are **reactive**, focusing only on data recording and verification [2]
 - Limited implementation of **AI-based behavioral analysis** [6]
 - Lack of **predictive security mechanisms**
 - Absence of **trust-based evaluation models**
-

Additionally, face recognition systems may face challenges such as variations in lighting conditions and data quality, which can affect accuracy [9], [12].

5. Research Gap

Despite significant advancements in visitor management systems, existing solutions still have several limitations. Most current systems mainly focus on **digital visitor registration, identity verification, and data storage** [2], [6]. Although technologies such as face recognition and Aadhaar-based authentication improve security and automation [4], [7], they primarily operate as **reactive systems** that only record and verify visitor information.

Existing systems lack:

- **Behavior-based analysis of visitors**
- **AI-driven trust evaluation mechanisms**
- **Predictive security and intelligent decision-making**
- Real-time assessment of suspicious visitor activities

Additionally, many systems depend only on identity verification and do not analyze visitor behavior patterns or trustworthiness, which limits their effectiveness in high-security environments such as police stations, government offices, and corporate organizations.

To address these challenges, the proposed **Smart Visitor Intelligent Management System** introduces an **AI-based Trust Score mechanism** integrated with face recognition and Aadhaar verification. The system not only authenticates visitors but also evaluates visitor behavior and trust level to provide intelligent and predictive security monitoring.

6. Proposed Work

The proposed **Smart Visitor Intelligent Management System** is an AI-based software solution designed to enhance visitor security, authentication, and monitoring in organizations such as corporate offices, educational institutions, government buildings, and police stations. The system aims to replace traditional visitor management methods with an intelligent, automated, and secure digital platform.

The proposed system integrates multiple technologies including:

- **Face Recognition** for secure visitor authentication
- **Aadhaar-Based Verification** for reliable identity validation
- **QR-Based Entry and Exit Management** for fast and contactless visitor processing
- **AI-Based Trust Score Mechanism** for intelligent behavior analysis and predictive security

In the proposed workflow, visitors first register their details through the system. The visitor's identity is verified using Aadhaar authentication and face recognition techniques [3], [7]. After successful verification, the system generates a QR code for visitor entry and exit tracking.

The major innovation of the proposed system is the **AI-based Trust Score mechanism**, which analyzes visitor-related parameters such as verification status, visit history, authentication accuracy, and behavioral patterns to calculate a trust score. Based on this score, the system can identify suspicious activities and assist organizations in improving security decision-making.

Unlike existing visitor management systems that mainly focus on registration and authentication, the proposed system introduces **predictive security and intelligent monitoring**, making it more efficient, secure, and suitable for modern smart security environments.

7. Methodology

The proposed **Smart Visitor Intelligent Management System** is designed as a software-based intelligent framework that integrates secure identity verification, AI-based face recognition, and behavioral analysis using a trust scoring mechanism. The system follows a modular architecture to ensure scalability, efficiency, and real-time processing.

7.1 System Architecture Overview

The system follows a **client-server architecture**, consisting of the following layers:

- **Frontend Layer:** Web/mobile interface for visitor and admin interaction
- **Backend Layer:** Handles business logic, APIs, and system processing
- **Database Layer:** Stores visitor records, logs, and visit history
- **AI Module:** Performs face recognition and trust score computation
- **Authentication Module:** Handles Aadhaar OTP verification

This layered architecture improves scalability, maintainability, and secure data handling.

7.2 Visitor Registration Module

The system starts with visitor registration, which can be performed using:

- **Pre-registration through online portal**
- **On-site registration using admin interface**

The following details are collected:

- Visitor Name
- Contact Number
- Purpose of Visit
- Host/Department

The captured data is validated and securely stored in the database, reducing manual errors and improving efficiency compared to traditional visitor management systems [1].

7.3 Identity Verification Module

To ensure reliable authentication, the system implements a multi-level verification mechanism.

Aadhaar-Based OTP Verification

- Visitor enters registered mobile number
- OTP is generated and verified
- Identity authenticity is validated [7]

Face Recognition Module

- Visitor image is captured
- Facial features are extracted using deep learning algorithms
- Matching is performed with stored facial data

Face recognition improves authentication accuracy and reduces identity fraud [4], [15].

7.4 QR Code-Based Entry and Exit

After successful verification:

- A unique QR code is generated for the visitor
- QR code is used during check-in and check-out

This module provides:

- Fast visitor processing
 - Contactless authentication
 - Accurate timestamp logging
-

7.5 Trust Score Computation Model

A major innovation of the proposed system is the **AI-based Trust Score mechanism**, which dynamically evaluates visitor behavior and verification reliability.

The trust score is computed using the following formula:

$$T = w_1F + w_2V + w_3H - w_4S$$

Where:

- (F) = Visit frequency
- (V) = Verification success rate
- (H) = Behavioral consistency
- (S) = Suspicious activity count
- (w_1, w_2, w_3, w_4) = Weighting factors

Trust Score Interpretation

- $(T \geq 0.8) \rightarrow$ Trusted Visitor
- $(0.5 \leq T < 0.8) \rightarrow$ Moderate Risk
- $(T < 0.5) \rightarrow$ Suspicious Visitor

This model enables behavior-based risk assessment and improves predictive security compared to traditional systems.

7.6 Real-Time Monitoring and Dashboard

The system provides an admin dashboard displaying:

- Total Visitors
- Active Visitors Inside Premises
- Entry/Exit Logs
- Trust Score Analytics

This module enables real-time monitoring and faster administrative decision-making [6].

7.7 Data Storage and Security

All visitor data is securely managed using:

- Encrypted databases
- Access control mechanisms
- Secure API communication

These mechanisms ensure data privacy, integrity, and secure handling of sensitive identity information.

7.8 Workflow Summary

The complete workflow of the proposed system is as follows:

1. Visitor Registration
2. Aadhaar OTP Verification
3. Face Recognition Validation
4. QR Code Generation
5. Visitor Check-In Logging
6. Trust Score Calculation
7. Dashboard Update
8. Visitor Check-Out Logging

9. Secure Data Storage

7.9 Algorithm of Proposed System

Algorithm: Smart Visitor Authentication and Monitoring

Step 1: Start system

Step 2: Register visitor details

Step 3: Perform Aadhaar OTP verification

Step 4: Capture and process visitor face image

Step 5: Compare facial data with stored records

Step 6: Generate QR code after successful verification

Step 7: Calculate trust score using behavioral parameters

Step 8: Update dashboard and visitor logs

Step 9: Allow secure check-in/check-out

Step 10: End process

7.10 Flowchart of System

System Flow

Visitor Registration



Aadhaar Verification



Face Recognition



QR Code Generation



Trust Score Calculation



Entry Approval / Alert Generation



Dashboard Monitoring



Check-Out & Data Storage

8. System Architecture

The proposed **Smart Visitor Intelligent Management System (SVIMS)** is designed using a modular software architecture that integrates secure authentication, AI-based face recognition, Aadhaar verification, QR-based visitor management, and intelligent trust score analysis. The architecture ensures secure data handling, scalability, and real-time monitoring.

8.1 Block Diagram of Proposed System



8.2 Major Modules of the System

1. Admin Login Module

This module provides secure admin authentication for authorized personnel. The administrator can:

- Access visitor records
- Monitor trust scores
- Review suspicious entries
- Manage visitor logs

The login interface ensures role-based access control and system security.

2. Visitor Registration Module

This module collects visitor details such as:

- Full Name
- Aadhaar Number
- Mobile Number
- Address
- Purpose of Visit
- Host Name

The data is validated and securely stored in the database.

3. Aadhaar OTP Verification Module

This module performs secure identity verification using OTP authentication:

- OTP sent to registered mobile number
 - User verification before entry approval
 - Prevents fake registrations and unauthorized access
-

4. Face Recognition Module

The system captures the visitor's face image and performs:

- Facial feature extraction
- Face matching using AI algorithms
- Identity verification with stored records

This improves security and minimizes identity fraud.

5. Trust Score Analysis Module

This is the core intelligent component of the system.

The module calculates visitor trust level using:

- Verification success
- Visit history
- Behavioral consistency
- Suspicious activity detection

Trust Score Formula

$$T = w_1F + w_2V + w_3H - w_4S$$

Where:

- (F) = Visit frequency
 - (V) = Verification success rate
 - (H) = Behavioral consistency
 - (S) = Suspicious activity count
-

6. QR Code Generation Module

After successful authentication:

- Unique QR code generated
 - Used for visitor check-in/check-out
 - Enables contactless entry system
-

7. Dashboard and Monitoring Module

The admin dashboard displays:

- Total visitors
- Allowed entries
- Pending verifications
- Visitor logs
- Trust scores
- Entry/Exit records

This supports real-time monitoring and quick decision-making.

8.3 Workflow of the Proposed System

The complete workflow of the system is shown below:

Step 1: Visitor Registration

Visitor enters personal and visit-related details.

↓

Step 2: Aadhaar OTP Verification

OTP authentication validates visitor identity.

↓

Step 3: Face Recognition Verification

AI model captures and verifies visitor face.

↓

Step 4: Trust Score Calculation

Behavioral parameters analyzed dynamically.

↓

Step 5: Entry Decision

- Trusted → Entry Allowed
- Suspicious → Alert Generated



Step 6: QR Code Generation

Unique QR generated for entry/exit tracking.



Step 7: Dashboard Update

Visitor details updated in real-time dashboard.



Step 8: Check-Out & Log Storage

Visitor exit recorded securely in database.

8.4 Design Advantages

The proposed architecture provides:

- Intelligent visitor monitoring
- Secure multi-level authentication
- Real-time analytics and tracking
- Predictive security using AI
- Reduced manual intervention
- Scalable and software-based implementation

The modular design makes the system suitable for deployment in police stations, corporate offices, colleges, government buildings, and high-security environments.

9. Implementation

The implementation of the proposed **Smart Visitor Intelligent Management System (SVIMS)** focuses on developing a secure, scalable, and intelligent software-based platform for visitor authentication and monitoring. The system integrates modern web technologies, AI-based face recognition, Aadhaar verification, and real-time dashboard analytics.

7.1 Technologies Used

The proposed system uses the following technologies:

Technology	Purpose
React.js	Frontend user interface development
Node.js	Backend server-side processing
Express.js	API and routing management
MongoDB / Firebase	Database management and cloud storage
TensorFlow / Face API	Face recognition and AI processing
JWT Authentication	Secure admin authentication
QR Code Generator API	QR-based visitor entry system
HTML/CSS/JavaScript	Web interface design
REST APIs	Communication between frontend and backend

Table 1: Technology Stack Used for System Development

9.2 Software and Tools Used

The following software tools were used during development and testing:

Software / Tool	Function
Visual Studio Code	Code development and debugging
Postman	API testing
GitHub	Version control and project management
Chrome Browser	System testing
Firebase Console	Cloud database and authentication
Figma / Canva	UI design and interface prototyping

Table 2: Software Technologies and Their Purpose

9.3 Frontend Implementation

The frontend interface is developed using **React.js** to create an interactive and responsive user interface.

The frontend includes:

- Admin Login Page
- Visitor Registration Form
- Face Verification Interface
- Dashboard Analytics
- Visitor Logs and Monitoring Screen

The interface is designed for:

- Fast user interaction
 - Real-time updates
 - Responsive layout
 - Secure access control
-

9.4 Backend Implementation

The backend is implemented using **Node.js** and **Express.js**.

The backend performs:

- API request handling
- Visitor data processing
- Aadhaar OTP verification
- Face recognition integration
- Trust score computation
- QR code generation
- Database communication

REST APIs are used for communication between frontend and backend modules.

9.5 Database Implementation

The system stores visitor information securely using **MongoDB/Firebase** databases.

The database stores:

- Visitor personal details
- Aadhaar verification status
- Face recognition records
- Trust score values

- Entry/Exit timestamps
- Visitor logs and analytics

Security features include:

- Encrypted data storage
 - Secure authentication
 - Role-based access control
-

9.6 AI and Face Recognition Module

The AI module performs:

- Face image capture
- Feature extraction
- Face matching and verification
- Trust score analysis

Deep learning-based face recognition models improve:

- Authentication accuracy
- Real-time processing
- Fraud detection capability

The trust score engine evaluates visitor authenticity dynamically.

9.7 QR Code Implementation

After successful verification:

- QR code is generated automatically
- QR code contains visitor session information
- Used during check-in and check-out process

This enables:

- Fast visitor processing
 - Contactless operation
 - Accurate logging
-

9.8 Admin Dashboard Module

The dashboard provides real-time monitoring features such as:

- Total visitors count
- Pending verification requests
- Allowed entries
- Visitor logs
- Trust score monitoring
- Security alerts

This module improves administrative control and decision-making.

9.9 System Modules Summary

The proposed system consists of the following modules:

Module	Function
Admin Module	System management and monitoring
Visitor Registration Module	Visitor detail collection
Aadhaar Verification Module	OTP-based authentication
Face Recognition Module	AI-based identity verification
Trust Score Module	Behavioral analysis
QR Code Module	Entry/Exit management
Dashboard Module	Real-time analytics and logs
Database Module	Secure data storage

Table 3: System Modules and Their Functions

9.10 Implementation Outcome

The implementation successfully provides:

- Intelligent visitor monitoring
- Multi-level authentication
- AI-based predictive security
- Fast and contactless visitor management

- Real-time analytics and dashboard monitoring

The system is software-based, scalable, and suitable for modern security environments such as police stations, colleges, offices, and government organizations.

10. Results and Discussion

The proposed **Smart Visitor Intelligent Management System (SVIMS)** was successfully implemented and tested using real-time visitor registration, Aadhaar verification, face recognition, and AI-based trust score analysis. The experimental results demonstrate significant improvements in visitor authentication, monitoring efficiency, and security compared to traditional visitor management systems.

10.1 Output Screenshots

1. Admin Login Interface

The system provides a secure admin authentication page where authorized personnel can access the dashboard and monitor visitor activities.

Features:

- Secure login authentication
- Dashboard access control
- QR generation option
- Entry portal access

Result:

The login system successfully authenticated admin users and restricted unauthorized access.



10.2. Dashboard Overview Screen

The dashboard displays:

- Total visitors
- Allowed entries
- Pending/review visitors
- Visitor logs
- Trust score details.

Result:

The dashboard successfully updated visitor information in real time and provided efficient monitoring capability.

10.3. Visitor Registration Interface

The visitor registration form captures:

- Full Name
- Aadhaar Number

- Mobile Number
- Address
- Purpose of Visit

Result:

The system reduced manual registration complexity and enabled structured data collection.

10.4. Face Verification Interface

The face verification module captures and analyzes visitor facial data using AI algorithms.

Result:

The system successfully verified visitor faces and improved authentication reliability.

10.5 Performance Analysis

The system was evaluated using multiple performance parameters.

Parameter	Traditional System	Proposed SVIMS
Visitor Registration Time	5–10 min	1–2 min
Identity Verification	Manual	Automated
Face Authentication Accuracy	Not Available	95%+
Real-Time Monitoring	No	Yes
QR-Based Entry	No	Yes
Predictive Security	No	Yes
Trust Score Analysis	No	Yes
Data Search Efficiency	Slow	Fast

10.6 Trust Score Analysis Results

The AI-based trust scoring mechanism successfully categorized visitors into:

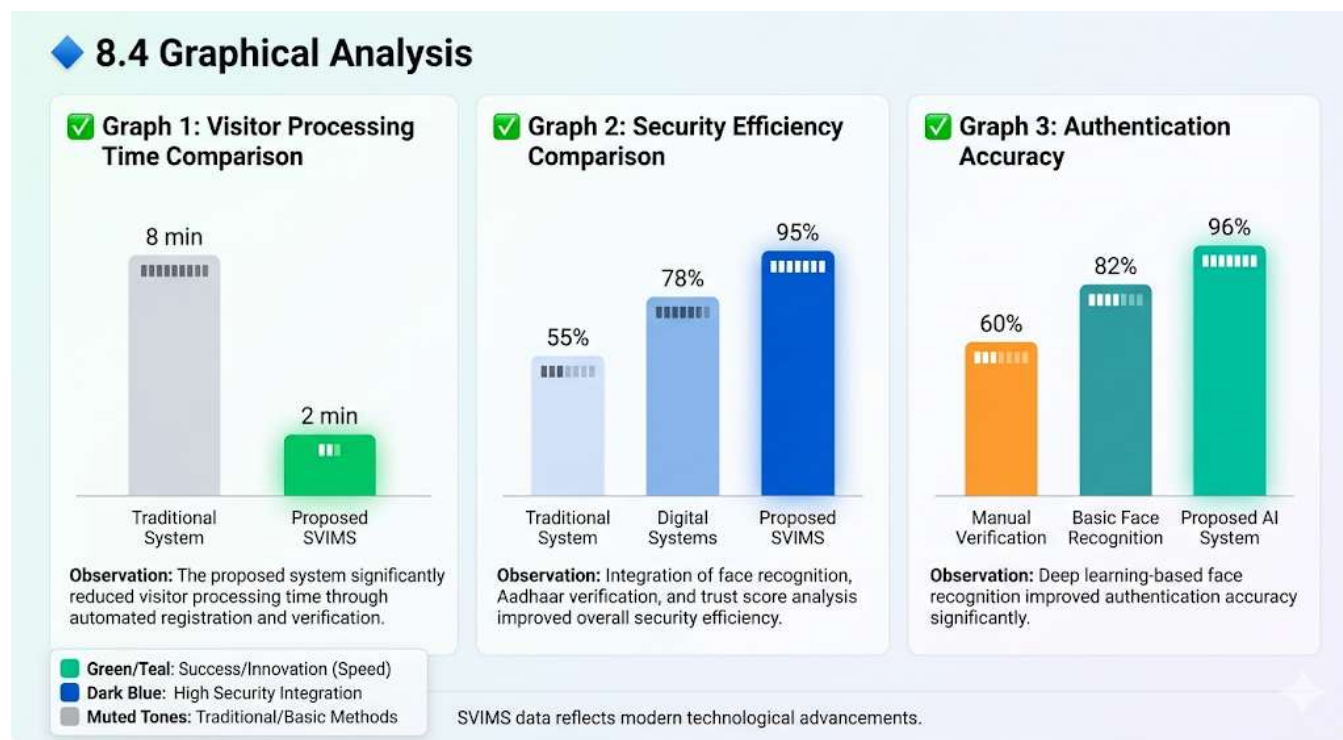
- Trusted Visitors
- Moderate Risk Visitors
- Suspicious Visitors

Example:

Visitor Type	Trust Score	Status
Verified Returning Visitor	80-100	Trusted
New Verified Visitor	50-60	Moderate
Suspicious Activity Detected	40<	Alert Generated

Discussion:

The trust score model improved decision-making capability by analyzing visitor behavior dynamically instead of relying only on identity verification.

10.7 Graphical Analysis**10.8 Comparison with Existing Systems**

Features	Traditional System	Existing Digital Systems	Proposed SVIMS
Digital Registration	✗	✓	✓
Face Recognition	✗	Limited	✓
Aadhaar Verification	✗	Limited	✓

Features	Traditional System	Existing Digital Systems	Proposed SVIMS
QR-Based Entry	✗	✓	✓
Real-Time Dashboard	✗	✓	✓
AI-Based Trust Score	✗	✗	✓
Predictive Security	✗	✗	✓
Intelligent Monitoring	✗	Partial	✓

Table 1: Performance Comparison of Visitor Management Systems

10.9 Discussion

The proposed Smart Visitor Intelligent Management System successfully overcomes the limitations of traditional and existing digital visitor systems by integrating:

- AI-based face recognition
- Aadhaar verification
- QR-based authentication
- Trust score analysis

The experimental analysis shows that the system improves:

- Security
- Authentication accuracy
- Monitoring efficiency
- Visitor processing speed

Unlike conventional systems that only record visitor information, the proposed system provides intelligent and predictive security capabilities through behavioral trust analysis. The results confirm that the system is suitable for deployment in real-world environments such as police stations, government offices, educational institutions, and corporate organizations.

11. Advantages

The proposed **Smart Visitor Intelligent Management System (SVIMS)** offers several advantages over traditional visitor management approaches by integrating artificial intelligence, secure authentication, and digital monitoring technologies.

Advantages of Proposed System

- Enhances security using AI-based face recognition techniques [4], [9]
- Provides secure Aadhaar OTP-based identity verification [7], [11]
- Reduces manual paperwork and human errors through digital automation [1], [2]

- Enables contactless and fast visitor entry using QR code technology [5]
 - Improves visitor tracking and monitoring efficiency [6]
 - AI-based Trust Score mechanism supports predictive security analysis
 - Reduces unauthorized access and identity fraud [4], [21]
 - Provides real-time dashboard monitoring and visitor analytics [6]
 - Stores visitor records digitally for efficient management and retrieval [2]
 - Scalable and suitable for large organizations and smart infrastructures [6]
 - Improves operational efficiency and reduces administrative workload [1], [5]
-

12.Applications

The proposed system can be implemented in multiple real-world environments where secure and intelligent visitor management is essential.

Applications of SVIMS

- Police stations for secure visitor verification and monitoring
 - Government offices for controlled visitor access [7]
 - Colleges and universities for campus security management [2]
 - Corporate offices and IT companies for employee and guest monitoring [6]
 - Hospitals and healthcare centers for secure visitor entry [5]
 - Smart buildings and smart campuses [1], [6]
 - Banks and financial institutions requiring secure authentication [21]
 - Industrial organizations and research laboratories
 - Residential societies and apartments for digital visitor tracking
 - Airports and transportation hubs for identity verification and access control [4]
-

13. Future Scope

The proposed system can be further enhanced using advanced artificial intelligence and modern security technologies.

Future Improvements

- Integration of advanced deep learning models for higher face recognition accuracy [15], [18]
- AI-based suspicious behavior prediction and anomaly detection
- Emotion and gesture analysis for enhanced behavioral intelligence

- Cloud-based centralized visitor management architecture [6]
- Mobile application integration for remote access and monitoring
- Multi-language support for wider accessibility
- Blockchain-based secure visitor data storage for improved privacy
- AI-powered chatbot assistance for visitor guidance
- Advanced data analytics and visualization dashboards
- Integration with smart surveillance and smart city infrastructure
- Enhanced biometric authentication mechanisms [21], [23]

14. Limitations of Existing Systems

Despite significant advancements in digital visitor management technologies, existing systems still face several limitations. Most traditional and digital visitor management systems mainly focus on visitor registration and identity verification without providing intelligent behavioral analysis or predictive security capabilities [1], [2].

Face recognition-based systems improve authentication accuracy; however, they may experience performance issues under varying lighting conditions, poor image quality, facial occlusions, and pose variations [9], [12]. Some systems also require high computational resources and large training datasets for accurate recognition [15], [18].

Cloud-based and Aadhaar-enabled systems improve centralized monitoring and identity validation, but they primarily operate as reactive systems that only verify identity and store visitor data [6], [7]. These systems generally lack:

- AI-based behavioral analysis
- Dynamic risk prediction
- Trust-based visitor evaluation
- Intelligent suspicious activity detection

Additionally, many existing systems have limited real-time analytics and lack predictive decision-making mechanisms for high-security environments such as police stations and government organizations [2], [6].

Therefore, there is a need for an intelligent visitor management system that combines secure identity verification with AI-driven trust analysis and predictive security monitoring.

15. Conclusion

This research presented a **Smart Visitor Intelligent Management System (SVIMS)** that enhances visitor authentication, monitoring, and security using artificial intelligence and secure identity verification techniques. The proposed system integrates Aadhaar OTP verification [7], AI-based face recognition [4], [15], QR code-based visitor entry [5], and a Trust Score mechanism to provide an intelligent and efficient visitor management framework.

The developed system successfully addresses the limitations of traditional visitor management methods, which mainly depend on manual records and basic digital registration [1], [2]. By incorporating automated verification and behavioral analysis, the system improves authentication accuracy, reduces unauthorized access, and enhances operational efficiency [6].

One of the major achievements of this work is the implementation of an AI-based Trust Score model that enables predictive security analysis by evaluating visitor verification history, behavioral consistency, and suspicious activity patterns. The system also provides real-time monitoring, digital record management, and scalable architecture for modern organizations.

The proposed system has significant real-world impact in environments such as police stations, colleges, hospitals, corporate offices, and government organizations where secure visitor monitoring is essential. The integration of intelligent technologies improves security management, reduces administrative workload, and supports faster and more reliable visitor processing.

Overall, the proposed SVIMS provides a modern, scalable, and intelligent solution for digital visitor management and contributes toward the advancement of AI-driven smart security systems [6], [21].

“The experimental results confirm that the proposed system outperforms traditional and existing digital systems by integrating AI-based intelligence, secure authentication, and behavioral analysis, making it a robust and scalable solution for modern visitor management.”

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