VanishVault

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Abstract - The accelerating number of missing person cases presents a major social and executive challenge, especially in densely peopled regions. Being identification systems are largely homemade, fractured, and warrant real- time collaboration between families, authorities, and levy associations. This paper presents VanishVault, an artificial intelligence- grounded web platform designed to ameliorate missing person identification using facial recognition and centralized data operation. The system integrates deep literacy models for face embedding birth, similarity- grounded matching algorithms, and secure pall- grounded storehouse to enable automated comparison between reported missing individualities and unidentified persons. A structured case operation dashboard allows authorized users to cover progress and respond to match cautions efficiently. Experimental evaluation demonstrates dependable matching delicacy, optimized processing time, and scalable performance under concurrent operation conditions. The proposed frame highlights the practical operation of computer vision and intelligent data systems in philanthropic and public safety disciplines.

*Key Words***:** Facial Recognition, Missing Person Identification, Deep Learning, Computer Vision, Case Management, Artificial Intelligence.

1.INTRODUCTION

Missing person cases affect thousands of families every time and frequently involve children, senior individualities, and vulnerable grown-ups. Traditional hunt approaches depend heavily on published notices, insulated police databases, and homemade verification processes. These styles are slow, disconnected, and warrant intelligent robotization, reducing the probability of timely reunification.

Recent advancements in Artificial Intelligence (AI) and Computer Vision have significantly bettered facial recognition delicacy. Deep literacy models can prize distinctive facial features and comparing them efficiently across large datasets. still, there remains a gap in integrating similar technologies into a unified, accessible, and secure platform designed specifically for missing person case operation.

VanishVault is proposed as an AI- powered web- grounded system that combines facial recognition algorithms, structured database operation, and real- time announcement mechanisms. The ideal of the system is to reduce identification detainments, enable cooperative disquisition, and insure secure running of sensitive particular data.

2. Body of Paper
2.1 Problem Definition

The current missing person identification ecosystem suffers from several limitations:

- Fractured and non-integrated databases
- Manual cross-verification of photographs
- Delays in communication between authorities
- Limited community participation
- Absence of intelligent matching systems

These challenges lead to increased hunt duration and reduced recovery success rates.

2.2 Proposed System Architecture

The VanishVault framework is divided into four primary layers:

A. Data Collection Layer

Users such as family members, volunteers, or authorities submit personal information including name, age, gender, last known location, and facial image. Data confirmation mechanisms help duplication and insure record thickness.

B. Data Storage Layer

All case data is stored in a structured database with encryption mechanisms. part- grounded authentication ensures that only authorized labour force can pierce sensitive records.

C. AI Processing Layer

The identification process consists of:

1. Face discovery using computer vision ways.
2. Feature extraction using a deep learning-based facial embedding model.

3. Conversion of facial features into numerical vectors.
4. Similarity comparison using Euclidean distance metrics.
5. Generation of confidence scores to determine match probability.

When the similarity threshold exceeds a predefined value, the system generates automated alerts for verification.

D. Application Layer

The user interface includes:

- Missing person reporting form
- Search functionality using filters or image upload
- Authority dashboard
- Notification system
- Case check and feedback module
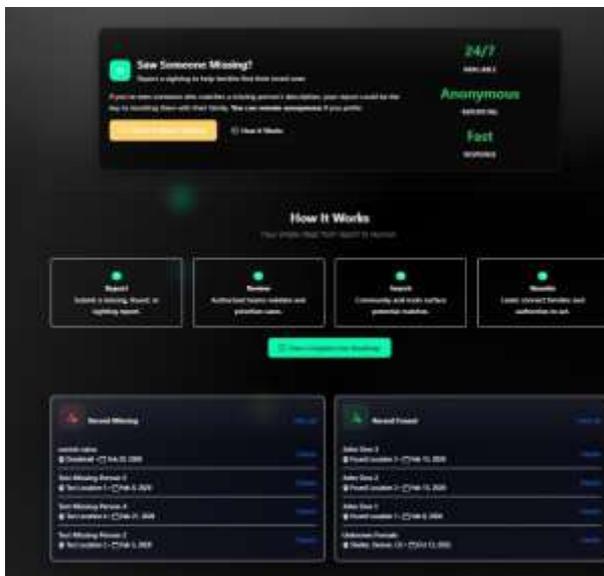
2.3 Methodology

The system development followed a structured approach:

1. Demand analysis and feasibility study
2. System design and architecture planning
3. AI model integration for facial recognition
4. Backend development using server-side framework
5. Database preparation with structured schema
6. Testing under controlled datasets
7. Deployment and performance validation

Controlled test datasets were used to measure system accuracy and response efficiency.

2.4 Performance Evaluation Parameters

The system was evaluated using the following metrics:

Identification Accuracy

Accuracy was measured by comparing true positive matches against total identification attempts.

Processing Time

Average time required for:

- Face embedding generation
- Database comparison
- Result display

Server Performance

Concurrent user simulation was conducted to test scalability and response stability.

Security Assessment

Data encryption verification and access control testing were performed to ensure privacy compliance.

Results indicate that the system performs reliably under moderate load conditions and maintains consistent response times.

2.5 Advantages of the Proposed System

- Faster identification compared to manual verification
- Centralized and structured case management
- AI-driven automated matching
- Secure and encrypted data storage
- Collaborative interface for authorities and families
- Scalable infrastructure for future expansion

Fig -1: Figure

3. CONCLUSIONS

VanishVault demonstrates how artificial intelligence and deep literacy can significantly ameliorate missing person identification processes. By integrating facial recognition algorithms, centralized data operation, and structured case workflows, the system reduces identification

detainments and enhances cooperative disquisition sweats. Experimental evaluation confirms that the proposed frame achieves dependable delicacy and maintains stable performance under concurrent access. The exploration emphasizes the significance of ethical AI deployment in public safety systems and provides a scalable foundation for unborn philanthropic technology operations.

ACKNOWLEDGEMENT

REFERENCES

[1] G. V. Vijay, M. P. Walunj, V. Vasave, and A. P. Suryavanshi, "Finding Missing Person Using Machine Learning," Int. J. Sci. Res. Sci. Technol., vol. 12, no. 5, pp. 649–654, Oct. 2025.

[2] T. Aswani, G. L. S. A. Amalodbhavi, P. U. Reddy, and M. M. Ali, "Face Recognition and Tracking of Missing Person using AI," J. Trends Comput. Sci. Smart Technol., vol. 7, no. 1, pp. 14–28, 2025.

[3] C. Chiranjeev, "Odyssey of Face Recognition for Social Good," Technol. Soc., vol. 79, Dec. 2025, Art. no. 102721.

[4] S. Reddy and P. Hari, "Missing Person Face Recognition Using Hybrid LBP and Siamese CNN," ResearchGate, Jan. 2026.

[5] "Missing Persons Identification Using Deep Learning," IJARSCT, 2024.

[6] H. Choung et al., "Acceptance of AI-Powered Facial Recognition Technology in Surveillance Contexts," Technol. Soc., vol. 79, Dec. 2024.

[7] IEEE Standard 2884-2023, "Performance Evaluation of Biometric Information: Facial Recognition," IEEE Std., Sep. 2023.

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