Facial Recognition Enabled Missing Kids Information System

Miss.[1] Jyothika K R, [2] Vikas D J

[1]*Assistant Professor, Department of MCA, BIET, Davanagere*

[2] *Student,4th Semester MCA, Department of MCA, BIET, Davanagere*

ABSTRACT:

This paper presents a web-based portal developed using the Flask framework to address the issue of missing and unidentified children. The system allows registered users to report cases by uploading detailed information and photographs, while leveraging facial recognition technology to assist in identifying potential matches. Administrators manage user accounts, content, and queries to maintain platform security and effectiveness. By enabling public participation and integrating modern technologies, the portal aims to improve the efficiency of child recovery efforts.

Keywords: missing children, unidentified children, web portal, Flask, facial recognition, child recovery, user management, public participation.

I. INTRODUCTION

The issue of missing and unidentified children is a growing concern worldwide, affecting families, communities, and law enforcement agencies alike. Each year, thousands of children go missing due to various reasons such as abduction, trafficking, accidents, or simply getting lost. The emotional trauma experienced by families and the societal impact of these cases are profound. Despite numerous efforts by authorities and organizations, the timely identification and recovery of missing children remain a challenging task. One of the critical factors contributing to this challenge is the lack of a centralized, accessible platform that facilitates efficient reporting, information sharing, and identification.

Traditionally, missing children cases are reported through local law enforcement or dedicated organizations, but these systems often operate in isolation with limited public involvement. Information dissemination is slow, and the process of matching unidentified children with missing persons is labor-intensive and prone to errors. Moreover, the absence of advanced technological integration, such as facial recognition, limits the chances of successful identification, especially when visual evidence is the primary clue. In many cases, unidentified children are found but remain unrecognized due to the lack of a systematic approach to cross-reference their images with existing missing children databases.

In this context, the integration of modern web technologies and artificial intelligence presents a promising solution to enhance child recovery efforts. A web-based platform that allows users to report missing or unidentified children, upload photographs and detailed descriptions, and utilize facial recognition algorithms can significantly improve the speed and accuracy of identification. Such a platform not only empowers law enforcement agencies but also actively involves the public, creating a collaborative environment for child safety. By enabling registered users to contribute information and search for matches, the system increases the chances of reuniting children with their families.

This paper introduces a centralized, scalable, and user-friendly web portal developed using the Flask framework in Python. The choice of Flask ensures a lightweight yet powerful backend capable of handling multiple user requests efficiently. The portal supports two main user roles: Registered Users and Administrators. Registered Users can create accounts, report missing or unidentified children by uploading images and descriptions, and search for potential matches using integrated facial recognition technology. Administrators have enhanced privileges to manage user accounts, oversee posted content, respond to queries, and ensure the platform's security and relevance.

The facial recognition component is a critical feature of the system. By analyzing uploaded images and comparing facial features with the existing database, the system can suggest potential matches, thereby reducing manual effort and increasing the likelihood of successful identification. This technology leverages advances in computer vision and machine learning to provide reliable results even under varying image conditions. The platform's responsive design ensures accessibility across devices, making it easier for users to participate actively regardless of their location.

Beyond technical capabilities, the platform fosters a sense of community involvement and responsibility. Missing children cases often require timely intervention, and public participation can be a vital factor in accelerating recovery efforts. By providing a secure and interactive portal, the system encourages users to share information, ask questions, and receive responses from administrators, creating a transparent and supportive environment.

In summary, this project addresses a critical societal issue by combining web development, facial recognition technology, and user-centric design to create an effective tool for reporting and identifying missing and unidentified children. The introduction of such a platform has the potential to revolutionize child recovery processes, making them faster, more accurate, and more inclusive. The following sections of this paper will detail the system architecture, implementation, and evaluation of the proposed solution.

II. RELATED WORK

Missing children identification using face recognition and web scrapping, authors-nehar,rupalikumari,shravani h r,sushmitha m s,mrs. Neha gopal n, Missing children remain a critical global concern, necessitating advanced

technological solutions to improve recovery rates. This paper explores the application of facial recognition technology as a powerful tool for identifying missing children by analyzing and matching unique facial features against a comprehensive image database. Additionally, the integration of web scraping techniques allows for the automated search of online images, further expanding the reach and effectiveness of the identification process. Together, these methods offer a promising approach to enhance efforts in locating and reuniting missing children with their families.[1]

Missing child identification system using deep learning and multiclass svm, Authors- rayabarapualekya, dr. P. Velayutham, This paper addresses the persistent issue of untraced missing children in India by introducing a deep learning-based facial recognition system for identification. The approach allows the public to upload photos of suspected missing children to a centralized portal, where each image is automatically compared against a database of registered missing children. The system utilizes a pre-trained VGG-Face Convolutional Neural Network (CNN) to extract high-level facial features, while a trained SVM classifier performs the final identification. This method is robust against variations in noise, lighting, pose, and age, achieving an impressive 99.41% accuracy in tests on 43 child cases, and demonstrates significant improvement over traditional face recognition techniques.[2]

Missing child identification using deep learning dr. P vijayakarthik, prerana m, shwetha h m, karunya s, mohan raj m s, India faces a persistent crisis of missing children, with thousands remaining unaccounted for each year despite ongoing recovery efforts. This study introduces a deep learning-based face recognition approach to help identify missing children from large photo databases. The system enables the public to upload images and relevant details of suspected missing children to a shared platform, where each image is automatically compared with registered photos in the repository. Using a trained deep learning model, the platform efficiently matches and classifies uploaded images, increasing the chances of correctly identifying and recovering missing children through advanced facial recognition technology.[3]

Missing Child Tracking and Identifying Using Facial Recognition, Authors- Aditya Mahimkar, Dilip Jain, Siddhesh Kadam,Dr. Kishor T. Patil,The disappearance of a child deeply affects families and communities, highlighting the urgent need for efficient solutions. Manual methods for tracking and matching missing children are slow and impractical, especially in a populous country like India. The "Nest" project addresses this challenge by providing an online web portal that connects police departments and NGOs nationwide. It features a centralized database for storing details of missing and found children, enhanced with a facial recognition system to improve identification speed and accuracy. By leveraging technology, Nest aims to streamline recovery efforts and reunite missing children with their families.[4]

Finding the Missing Person Using Artificial Intelligence,Authors-Mrs Prasanna N, Pathipati

Harshitha, Monali B Pipaliya, Gagan R, This paper presents an advanced AI-driven approach to locating missing individuals, overcoming the limitations of traditional manual search methods. By leveraging machine learning and computer vision, the system uses deep learning algorithms and large facial image databases to match missing persons with potential sightings from sources like surveillance cameras, social media, and public records. Utilizing the MTCNN algorithm for facial recognition, the system enables accurate and efficient identification, significantly improving the chances of finding missing individuals quickly and effectively.[5]

Face Recognition Surveillance and Communication System for Missing Persons, Authors- Dr Ambika L G, Kadiri Kavya, Kusuma C, Guddampalli Sravani, Keerthana M,VisionRescue introduces an AI-powered, real-time facial recognition system to address the escalating global crisis of missing persons, including vulnerable groups such as children, teens, and the elderly. Unlike traditional, manual search processes that are slow and resource-intensive, this system continuously scans live video feeds in public spaces and compares detected faces against a pre-stored database of missing individuals. If a match is found, authorities are instantly alerted, greatly improving response speed and accuracy. The solution is lightweight, efficient, and can be deployed in locations like airports and train stations, significantly increasing the chances of reuniting missing individuals with their families and transforming public safety efforts through the integration of advanced AI and computer vision technologies.[6]

Finding Missing Person/Child Using AI, Authors- Divyansh Yadav, Janhvi Tyagi, Dipanshu, Ritu Tiwari, Ms. Pawan Pandey, Finding missing persons, especially children, is an urgent and challenging task that traditional manual methods often struggle to address efficiently. This paper proposes an AI-based system that utilizes advanced machine learning and computer vision techniques to improve the search and recovery process. By leveraging large facial image databases and deep neural network algorithms, the system can accurately identify and match missing individuals with images from surveillance cameras, social media, and public databases. The use of facial recognition enables automated, rapid comparisons, significantly increasing the chances of timely identification and recovery, and highlighting the vital role of AI in addressing the issue of missing persons.[7]

AI for Detection of Missing Person, Authors:B. Vinavatani,Medha Rachel Panna,Premil a H. Singha,andG. Jaspher Willsie Kathrine,
Identifying and reuniting missing individuals with their families remains a global challenge, with traditional methods often falling short. This paper reviews various existing approaches, highlighting both their strengths and limitations, and emphasizes the growing importance of facial recognition technology in addressing this issue. Leveraging advances in artificial intelligence, the proposed system significantly improves identification accuracy, achieving a 90% precision rate—substantially higher than previous methods using KNN or SVM with PCA. This demonstrates the potential of AI-driven facial recognition to

enhance the effectiveness of missing person recovery efforts worldwide.[8]

Missing child identification system using deep learning and multi-class support vector machine, This project tackles the global issue of missing child identification by introducing a novel deep learning approach that combines convolutional neural networks (CNN) and multiclass SVM. By training a CNN on a large dataset of child images to extract distinctive features and using a multiclass SVM for improved classification, the system achieves high accuracy in identifying missing children, outperforming traditional methods. The approach proves effective across diverse age groups, ethnicities, and regions, highlighting its potential as a powerful tool in combating child trafficking and kidnapping, and demonstrating the significant impact of deep learning in solving complex real-world challenges.[9]

Missing Child Identification using Convolutional Neural Network, Authors: M. Raghavendra, R. Neha , S. Manasa, Asst Prof. Mrs. A.V Lakshmi Prasuna, This study introduces an advanced approach for identifying missing children by leveraging deep learning algorithms, specifically Convolutional Neural Networks (CNN), to analyze large datasets of child photographs. The method utilizes facial recognition to extract high-level features from images, enabling precise identification even in the presence of challenges such as noise, varying lighting, occlusion, different poses, and changes in a child's age. By carefully selecting and training the best-performing CNN model, the system significantly outperforms traditional methods, offering greater accuracy and robustness in matching missing children with their photographs in the database.[10]

III. METHODOLOGY

Proposed Methodology

The proposed methodology for the Facial Recognition Enabled Missing Kids Information System leverages advanced deep learning techniques and a centralized web portal to streamline the identification and recovery of missing children. The workflow is structured into distinct modules, ensuring accuracy, security, and ease of use for both the public and authorities.

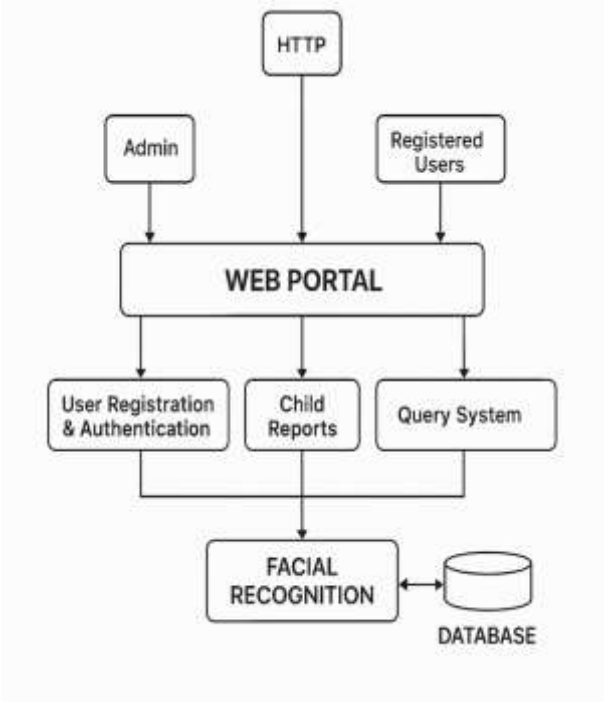

Fig 3.1. Proposed Methodology

3.1.User Registration and Missing Child Report Submission

Users, including parents, guardians, and concerned citizens, register on the platform by providing essential details. Registered users can submit reports of missing or found children, uploading

recent photographs and descriptive information. These images and details are securely stored in the system's database, forming a comprehensive repository for identification purposes.

3.2.Face Detection and Feature Extraction

Upon image upload, the system employs face detection algorithms such as Histogram of Oriented Gradients (HOG) or deep learning-based detectors to accurately locate and crop facial regions from submitted photos. Advanced landmark estimation techniques identify key facial points, standardizing images through affine transformations to ensure consistency in facial alignment, regardless of pose or lighting conditions.

3.3.Deep Learning-Based Face Recognition

The core of the system utilizes a deep learning model—such as a pre-trained Convolutional Neural Network (CNN) architecture like VGG-Face, ResNet-50, or VGG-16—for high-level feature extraction from facial images. These models generate robust face descriptors that are invariant to noise, illumination, occlusion, and age variations. The extracted features are then classified using a trained Support Vector Machine (SVM) or similar classifier to identify the best match from the database of reported missing children.

3.4.Public Participation and Image Matching

The platform allows the public to upload photographs of unidentified or suspicious children encountered in public spaces. Each uploaded image is automatically compared against the repository of missing children using the facial recognition pipeline. The system highlights potential matches, enabling rapid verification by authorities or family members.

3.5.Administrative Oversight and Case Management

Administrators have dedicated dashboards to manage user accounts, review and validate posted reports, and monitor system activity for accuracy and security. They can update case statuses, respond to user queries, and maintain the integrity of the facial dataset. The platform supports role-based access control, ensuring sensitive information is accessible only to authorized personnel.

3.6.Real-Time Alerts and Communication

Upon identification of a potential match, the system generates real-time alerts to relevant stakeholders, including law enforcement and registered users. Integrated communication tools facilitate direct queries and responses between users and administrators, enhancing collaboration and speeding up the recovery process.

3.7.Data Security and Privacy

All personal data, images, and transaction logs are encrypted and stored securely to comply with privacy regulations and ensure the safety of sensitive information. Regular audits and monitoring mechanisms are implemented to detect and prevent misuse or unauthorized access.

3.8.User-Friendly Web Interface

The entire process is facilitated through an intuitive, responsive web application—typically built with the Flask framework—enabling users to

easily register, submit reports, search for matches, and communicate with administrators. The interface is designed for accessibility across devices, ensuring broad public participation.

IV. TECHNOLOGIES USED

4.1.Python

Python is a versatile, high-level programming language that supports a wide ecosystem of libraries and frameworks, making it a leading choice for data analysis, scientific computing, machine learning, and web development. Libraries such as Pandas and NumPy are especially popular in Python: Pandas provides powerful and flexible data structures like DataFrames for easy manipulation, cleaning, and analysis of structured data, while NumPy offers efficient operations on large, multi-dimensional arrays and matrices, serving as the computational backbone for many scientific and analytical tasks.

4.2. OpenCV

OpenCV is a powerful open-source computer vision library widely used for image processing and real-time face detection tasks in missing child identification systems. In this application, OpenCV facilitates the detection and extraction of facial features from uploaded images or video streams using algorithms such as Haar Cascade classifiers and Histogram of Oriented Gradients (HOG). These extracted faces are then preprocessed and prepared for further analysis, ensuring accurate and efficient recognition even in varied lighting and environmental conditions.

4.3.NumPy

NumPy is a fundamental Python library for numerical computing and array manipulation, playing a crucial role in handling image data within the system. It enables efficient storage, transformation, and processing of image matrices, which is essential for operations like pixel normalization, image augmentation, and feature extraction. By leveraging NumPy, the system can perform high-speed mathematical operations on large datasets, supporting the computational demands of facial recognition workflows.

4.4. Flask

Flask is a lightweight and flexible Python web framework used to build the centralized web portal for the missing kids information system. It provides the backend infrastructure for user registration, image uploads, database management, and communication between users and administrators. Flask's simplicity and scalability make it ideal for developing responsive web applications that integrate seamlessly with machine learning models and computer vision tools like OpenCV and NumPy, ensuring a user-friendly and interactive experience for all stakeholders.

V.CONCLUSION

In conclusion, the Facial Recognition Enabled Missing Kids Information System represents a significant advancement in the search and recovery of missing children by integrating modern technologies such as OpenCV, NumPy, and Flask. By combining robust facial recognition algorithms with a user-friendly web portal, the system streamlines the process of reporting, identifying,

and tracking missing or unidentified children. The collaborative approach, involving both the public and authorities, enhances the chances of timely identification and reunification. Secure data handling and real-time communication further ensure the reliability and effectiveness of the platform. Overall, this solution demonstrates how the thoughtful application of computer vision and web technologies can address critical social challenges and improve child safety in our communities.

Reference

[1] nehar, rupalikumari, shravani r,sushmitha m s,mrs. Neha gopal n.Missing children identification using face recognition and web scrapping, publisher-international journal of scientific development and research (ijsdr), issn: 2455-2631 may 2023 ijsdr | volume 8 issue 5

[2] raybaarapualekya, dr. P. Velayutham, Missing child identification system using deep learning and multiclass svm, publisher- journal of engineering sciences vol 14 issue 01,2023,issn:0377-9254

[3] dr. P vijayakarthik, prerana m, shwetha h m, karunya s, mohan raj m s,Missing child identification using deep learning publisher- 2024 ijrar may 2024, volume 11, issue 2 www.ijrar.org (e-issn 2348-1269, p- issn 2349-5138)

[4] Aditya Mahimkar, Dilip Jain, Siddhesh Kadam,Dr. Kishor T. Patil, Missing Child Tracking and Identifying Using Facial Recognition,and Publisher- JETIREXPLORE, ISSN: 2349-5162 | ESTD Year : 2014 Volume 12 | Issue 6 | June 2025

[5] Mrs Prasanna N, Pathipati Harshitha, Monali B Pipaliya, Gagan R,Finding the Missing Person Using Artificial Intelligence Publisher- International Journal of Scientific Research and Engineering Development-– Volume 7 Issue 3, May-June 2024

[6] Dr Ambika L G, Kadiri Kavya, Kusuma C, Guddampalli Sravani, Keerthana M, Face Recognition Surveillance and Communication System for Missing Persons, Publisher- International Journal of Advanced Research in Science, Communication and Technology, ISSN: 2581-9429, Volume 5, Issue 6, May 2025

[7] Divyansh Yadav, Janhvi Tyagi, Dipanshu, Ritu Tiwari, Ms. Pawan Pandey,Finding Missing Person/Child Using AI,Publisher- International Journal of Research Publication and Reviews, ISN 2582-7421, www.ijrpr.com

[8] B. Vinavatani,Medha Rachel Panna,Premila H. Singha,andG. Jaspher Willsie Kathrine AI for Detection of Missing Person, Publisher: Institute of Electrical and Electronics Engineers (IEEE),DOI:10.1109/ICAAIC53929.2022.9792672

[9] Mrs.RavulaJyothsna,Mrs.Korukonda Naga Durga Saile,Mrs SurekhaGanapavarapu, Missing child identification system using deep learning and multi-class support vector machine, publisher- Industrial Engineering Journal, ISSN: 0970-2555, Volume : 50, Issue 7, No. 1, July 2021

[10] M. Raghavendra, R. Neha , S. Manasa, Asst Prof. Mrs. A.V Lakshmi Missing Child Identification using Convolutional Neural Network, Publisher-IJRASET, ISSN : 2321-9653, IJRASET53470