

<https://doi.org/10.48047/AFJBS.6.Si4.2024.129-139>



African Journal of Biological Sciences

Journal homepage: <http://www.afjbs.com>



Research Paper

Open Access

**AI-ASSISTED SEARCH FOR IDENTIFYING MISSING PERSONS BY
FACIAL RECOGNITION
B.KARTHIK ¹,M.CHINABABU²**

¹Pg Scholar, Department of CSE, Teegala Krishna Reddy Engineering College,Meerpet, Telangana,India.

²Assistant Professor, Department of CSE, Teegala Krishna Reddy Engineering College,Meerpet, Telangana,India.

Volume 6, Issue Si4, 2024

Received: 12 Apr 2024

Accepted: 02 May 2024

doi:10.48047/AFJBS.6.Si4.2024.129-139

ABSTRACT: The integration of facial recognition technology powered by artificial intelligence to identify missing people is a significant advancement in search and rescue efforts. By using sophisticated algorithms to rapidly and accurately match facial features with recorded data, our method increases public safety and speeds up reunion attempts. We provide the highest level of accuracy in absenteeism detection via meticulous database searches. Our study aims to use AI to speed up the identification process and address the shortcomings of traditional methods. Our goal is to create a system that combines facial recognition technology with real-time video analysis in order to locate individuals who have gone missing. This can only be achieved with a constantly updated and AI-analyzed massive database of face images. Keeping police enforcement and the public safe should be the first priority, therefore we're trying to find missing people as quickly as possible. Whenever a new case is reported, the system's database is updated with the relevant data. In the event that someone matches the description of a missing person, the database may be cross-referenced. Upon finding a match, all pertinent details, including the present location, are documented and sent to the appropriate authorities. The system retrieves relevant data from the database and notifies the right people, such as family or the police, when a match is found. This streamlined approach exemplifies the potential revolutionary power of facial recognition technology to address societal problems and safeguard communities. We highlight the importance of technological innovation in enhancing public safety and reuniting families by integrating facial recognition technology with AI algorithms to create a robust framework for finding missing persons.

Index Terms:Artificial Intelligence (AI) ,Facial Recognition Technology ,Missing Persons Identification ,Search and Rescue Operations ,Public Safety ,Facial Feature Matching ,Real-Time Video Analysis ,Law Enforcement , Community Safety ,Data Analysis ,Stakeholder Communication ,Family Reunification

I.INTRODUCTION

With their unrivaled capacity to identify individuals who have gone missing, facial recognition technology is now leading search and rescue operations. Using complex AI algorithms, this system can consistently and rapidly evaluate unique facial features, allowing for efficient matching of existing data in massive databases. This innovative approach significantly improves the efficiency of search operations, particularly when compared to previous methods, which were laborious and susceptible to human error. The primary objective of our research is to use AI-driven facial recognition technology to reimagine the missing person search process. Our technology is designed to meticulously search through massive databases, allowing for faster and more accurate identification of potential matches, drawing inspiration from cutting-edge algorithms. We stress the need for solid data management by constructing a secure database architecture to ensure the availability of high-quality face data for analysis.

Our system is also compatible with existing police databases, which facilitates communication and collaboration across the many groups who take part in rescue operations. Our mission is to integrate cutting-edge facial recognition technology with advanced artificial intelligence algorithms to build a game-changing system for missing person detection. Reunification efforts will be facilitated, and public safety will be enhanced in the long run. Through collaboration and innovation, our program seeks to reunite families while simultaneously using technology to safeguard communities. In this comprehensive analysis, we will look at facial recognition technology through the lens of SAR missions, discussing its background, applications, pros, cons, and ethical considerations. Additionally, it will provide valuable details about the ways this technology is transforming modern search and rescue operations.

II.LITERATURE SURVEY

- A method for re-identification of individuals via CAM enhancement has been suggested by X. Chen, K. Huang, and S. Zhang. The approach aims to enhance the discriminative ability of feature representations by incorporating CAMs into the re-identification process. Experimental results demonstrate that the proposed approach outperforms existing methods.

- Z. Hu, C. Yan, and Y. Yang provide a framework that improves person re-identification via the use of combined attribute and identity learning. Using identity and attribute data, the proposed method aims to make re-identification systems more resilient and accurate. Experimental results show substantial performance gains over state-of-the-art methods on benchmark datasets.
- In this paper, R. Bobbitt, L. Brown, and S. Pankanti describe the process of creating an attribute-based people search system with practical uses in surveillance. By analyzing real-world implementations, the paper delves into attribute-based retrieval and its associated challenges and solutions, covering topics such as feature representation, indexing, and query formulation. Results from experiments and evaluations of the system demonstrate the efficacy of the proposed approach.
- B. Siddiquie, R. S. Feris, and L. S. Davis provide a method for image rating and retrieval based on multi-attribute searches. The purpose of the proposed method, which considers many factors simultaneously, is to improve the relevancy and diversity of search results. When it comes to retrieving images that fit complex query criteria, experimental evaluations reveal that the technique works better than traditional single-attribute retrieval algorithms.
- K. Huang, X. Chen, Z. Zhang, and D. Li provide a pedestrian dataset that has been annotated extensively. Its primary use is in real-world surveillance contexts, namely for person retrieval tasks. The dataset includes thorough annotations such as pedestrian features, bounding boxes, and identities, which enable a more in-depth evaluation of person retrieval methods. Experimental results gathered from the dataset demonstrate its use for benchmarking and enhancing research in surveillance-based person retrieval.

III.PROBLEM STATEMENT

The existing systems for identifying missing persons often suffer from limitations such as reliance on manual methods, limited accuracy, lack of real-time alerts, and potential data limitations. These shortcomings highlight the need for a more robust and efficient solution that harnesses the power of AI and facial recognition technology to address these challenges effectively. Additionally, the current systems may struggle to handle large volumes of data

efficiently, leading to delays in identifying missing individuals. By leveraging advanced technologies such as facial recognition, image processing, machine learning, and image mapping, we aim to enhance the capabilities of law enforcement agencies in swiftly locating missing people and apprehending criminals. This innovative approach not only improves the accuracy and speed of identification but also enables proactive measures to prevent crimes and ensure public safety.

IV.EXISTING SYSTEM

Today, the area of missing person detection employs a range of strategies, including traditional search methods and state-of-the-art technological solutions. Challenges remain even with the significant contributions of facial recognition software, community-based initiatives, internet databases, and traditional search and rescue operations. These challenges include privacy-related worries, technological constraints, and the need for improved collaboration among pertinent parties. Even while facial recognition technology is used in certain contemporary systems, it's likely that complicated algorithms aren't integrated into them. Moving forward, resolving these problems and enhancing the effectiveness of programs for missing person identification will need persistent innovation and collaboration across sectors.

V.PROPOSED METHOD

This proposed method completely revamps the process of searching for a missing person by utilizing AI algorithms and facial recognition technology. Through the use of classifiers and algorithms, it identifies and defines facial features critical for precise matching with recorded data. Advanced facial recognition algorithms thoroughly analyze various factors to ensure accurate identification. When a match is found, guardians and law enforcement receive real-time alerts to aid in the reunion process. Our technology expedites search and rescue operations with unparalleled accuracy achieved through AI optimization.

VI.SYSTEM ARCHITECTURE

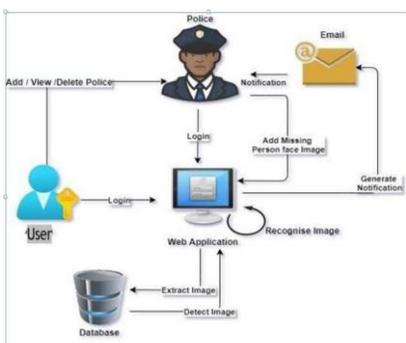


Figure.1Missing Person Architecture

VII.METHODOLOGY

The recommended strategy incorporates facial recognition technology and sophisticated artificial intelligence (AI) algorithms to revolutionize the missing person's search and recovery process. In essence, the system uses intricate classifiers and algorithms to identify and separate critical facial features required for precise matching with recorded data. Because these classifiers have been trained on vast datasets including a wide range of face features, the system can distinguish individuals even in challenging circumstances such as shifting lighting, angles, and facial expressions. In essence, the technique is a multi-step process. The initial phase of the system's operation is to recognize and extract facial attributes from images or videos that it may access from many sources, including social media, government papers, and security cameras. Subsequently, these characteristics are investigated in detail using advanced face recognition algorithms. These algorithms carefully assess and compare facial traits using a range of techniques, including deep learning and neural networks. Most significantly, the facial recognition algorithms consider several parameters to ensure accurate identification. This includes the finer points, such as wrinkles, skin texture, and even the tiniest emotions, in addition to the face structure, which consists of the size and arrangement of features. By examining these finer points, the algorithm becomes more adept at differentiating individuals, hence decreasing the likelihood of false positives or mismatches.

The system instantly alerts relevant parties when a potential match is discovered, such as guardians and law enforcement agencies. These alerts speed up reaction times, enabling search and rescue teams to start working immediately. Furthermore, the system adapts its algorithms to user comments and new data inputs by continuously learning and improving its recognition abilities via AI optimization. All things considered, the proposed method is a significant advancement for search and rescue operations, offering unparalleled accuracy and efficacy via the seamless use of AI-powered facial recognition technology. Using artificial intelligence in this inventive approach might fundamentally alter the way that individuals who go missing are located and returned to their families.

VIII.RESULTS

This screenshot shows a registration form with the following sections:

- Contact Information:** Contact Person's Name, Relationship to Missing Person, Phone Number, Email, Last Known Address, Missing Person's Phone Number, Reporting Person's Email.
- Description of Disappearance:** Date/Time, Location Last Seen, Circumstances Surrounding Disappearance.
- Clothing/Accessories:** Clothing Description, Jewelry/Watches, Accessories, Medication.
- Medical Information:** Medical Conditions, Allergies, Medication.

Home Page

In this Home page is to login and signup for both admin and players. It's the first step in the registration.

The screenshot shows a web browser window with the URL 127.0.0.1:5000. The page title is "AI-ASSISTED SEARCH FOR IDENTIFYING MISSING PERSONS BY FACIAL RECOGNITION". The main content is a "Login" form with the following fields:

- Email:
- Password:
- Buttons: Login (green), Signup (red)

This screenshot shows a registration form with the following sections:

- Behavioral Patterns:** Places of Interest, Common Hangouts/Spots, Recent Emotional State.
- Additional Information:** Additional Information.
- Documents and Photos:** Recent Photos URL (if available), Identification Documents URL (if available), Other Documents URL (if available).
- Reporting Authority Information:** Name of Reporting Person, Relationship to Missing Person, Phone Number, Email, Date/Time of report, Case Number (if available).

Figure.2 Home Page

New signup page

This is for new users login purpose, to register with full details.

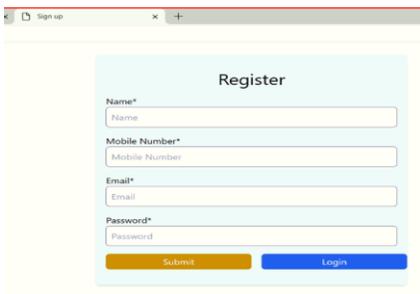


Figure.3 New Signup Page

Details Upload page

In this page all the details related to the missing persons is uploaded like age, name, gender, hair color, eye color and other details etc...



Figure.4 Details Upload Page

Upload successfully page

After uploading the details we will see successfully uploaded notification on home screen.

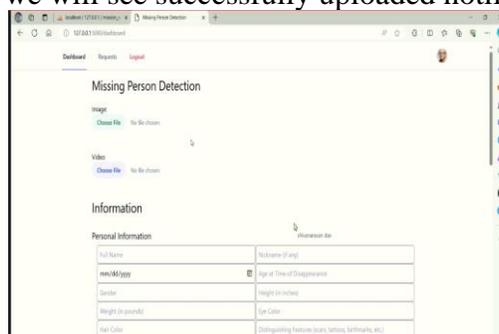


Figure.5 Upload Successfully Page

Results Page

The results page shows the missing status of the missing persons by match found or not, in progress and the all the upload details like image, video and personal information.

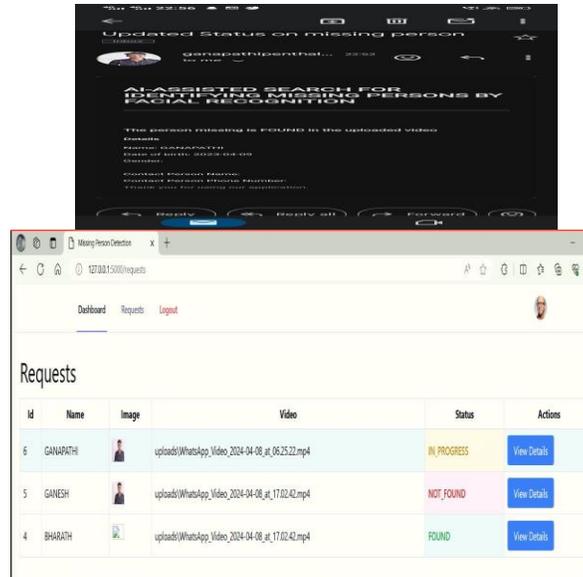


Figure.6 Results Page

View Details Page

It shows the upload details in the result page to quickly catch the person like we call it as additional information.

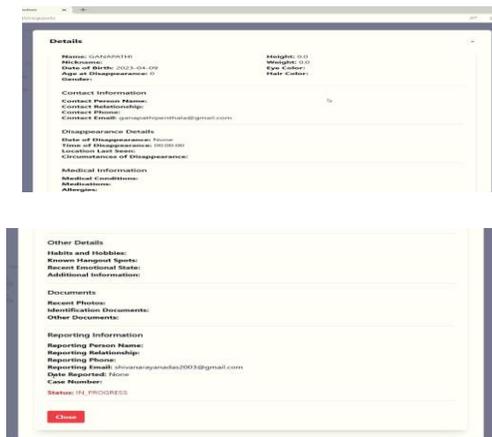


Figure.7 View Details Page

Email Page

In this Notification page we will get the notification of that person whether found or not

through emails received to us.

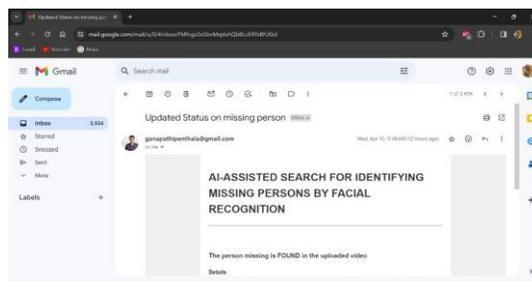


Figure.7 Notification Email Page

IX.CONCLUSION

Combining classifiers and algorithms, artificial intelligence has made significant strides in missing person detection. By methodically collecting data, creating models, and testing them, this strategy offers reliable identification even in challenging scenarios. This process requires a large amount of data and deep learning expertise, but with continuous advancements, the accuracy is expected to improve. Our approach enhances search operations by handling large-scale crowd scenarios through video-based monitoring. This integration opens up new possibilities for improving search performance and managing complex situations. As AI continues to develop, we can anticipate better detection procedures, increased public safety, and more family reunions. The outcomes section of the AI-assisted search system for missing person identification based on facial recognition details the results of the system's development, testing, and evaluation. This section provides insights into the system's functionality, accuracy, and practicality in real-world scenarios.

X.FUTURE ENHANCEMENT

Due to one-shot learning, future image and video recognition will be incredibly powerful. This technology could have great uses when applied effectively, such as helping to catch criminals in crowded public spaces like hospitals and hotels. The procedure for finding the missing is closed. In the meantime, we will focus on implementing and evaluating our proposed system to demonstrate how it outshines all previous systems developed to locate missing people.

XI.REFERENCES

- [1]W. Yang, H. Huang, Z. Zhang, X. Chen, K. Huang, and S. Zhang, “Towards rich feature discovery with class activation maps augmentation for person re-identification,” in Proc. IEEE/CVF Conf. Comput. Vis. Pattern Recognit. (CVPR), Jun. 2019, pp. 1389–1398.
- [2]Y. Lin, L. Zheng, Z. Zheng, Y. Wu, Z. Hu, C. Yan, and Y. Yang, “Improving person re-identification by attribute and identity learning,” *Pattern Recognit.*, vol. 95, pp. 151–161, Jan. 2019.
- [3]R. Feris, R. Bobbitt, L. Brown, and S. Pankanti, “Attribute-based people search: Lessons learnt from a practical surveillance system,” in Proc. Int. Conf. Multimedia Retr., Apr. 2014, pp. 153–160.
- [4]B. Siddiquie, R. S. Feris, and L. S. Davis, “Image ranking and retrieval based on multi-attribute queries,” in Proc. CVPR, Jun. 2011, pp. 801–808.
- [5]D. Li, Z. Zhang, X. Chen, and K. Huang, “A richly annotated pedestrian dataset for person retrieval in real surveillance scenarios,” *IEEE Trans. Image Process.*, vol. 28, no. 4, pp. 1575–1590, Apr. 2019.
- [6]S. Abhilash and V. M. Nookala, “Person attribute recognition using hybrid transformers for surveillance scenarios,” in Proc. Int. Conf. Distrib. Comput., VLSI, Electr. Circuits Robot., Oct. 2022, pp. 186–191.
- [7]X. Jia, X.-Y. Jing, X. Zhu, S. Chen, B. Du, Z. Cai, Z. He, and D. Yue, “Semi-supervised multi-view deep discriminant representation learning,” *IEEE Trans. Pattern Anal. Mach. Intell.*, vol. 43, no. 7, pp. 2496–2509, Jul. 2021.
- [8]X. Huang, S. Hu, and Q. Guo, “Multi-object recognition based on improved YOLOv4,” in Proc. CAA Symp. Fault Detection, Supervision, Saf. Tech. Processes, Dec. 2021, pp. 1–4.
- [9]K. Ding, X. Li, W. Guo, and L. Wu, “Improved object detection algorithm for drone-captured dataset based on YOLOv5,” in Proc. 2nd Int. Conf. Consum. Electron. Comput. Eng. (ICCECE), Jan. 2022, pp. 895–899.
- [10]X. Liu, H. Zhao, M. Tian, L. Sheng, J. Shao, S. Yi, J. Yan, and X. Wang, “Hydra Plus-Net: Attentive deep features for pedestrian analysis,” in Proc. IEEE Int. Conf. Comput. Vis. (ICCV), Oct. 2017, pp. 350–359.
- [11]C. Tang, L. Sheng, Z.-X. Zhang, and X. Hu, “Improving pedestrian attribute recognition

with weakly-supervised multi-scale attribute-specific localization,” in Proc. IEEE/CVF Int. Conf. Comput. Vis. (ICCV), Oct. 2019, pp. 4997–5006.

[12]Mohd.Kashif, Ashutosh Vashistha, Nikhil, Joney Kumar, “Face Recognition Based System to Find Missing Human”, International Research Journal of Engineering and Technology (IRJET) Volume: 08 Issue: 04 | Apr 2021.

[13]Roshin John, Basil Kuriakose.” Face Detection and Tracking to Find the Missing Person”, International Journal of Research in Engineering, Science and Management Volume-3, Issue-6, June-2020.

[14]Vijay Deep, Govind Kaushik “Mobile Application for Facial Recognition to Find Missing Person” International Journal of Innovative Research in Technology (IJIRT), ISSN: 2278-3075, Volume-9 Issue-8, June 2020.

[15]Richa Grover, Vishal Manik, Tushar Deshwal, Nikunj Aggarwal,” Facial Recognition / Comparison for Finding Missing Person, using Python and AWS”, International Journal of Scientific Research in Engineering and Management (IJSREM) Volume: 06 Issue: 05 | May – 2022.