IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 6, May 2024

An Review on Missing Person Detection System using Machine Learning

Dr Reshma Banu[1], Ayan Abdul Khader M A[2], M Arshad[3], Mahen M L[4], Ragavendra G[5]
Professor, Department of CSE[1]
Students, Department of CSE[2,3,4,5]
Vidya Vikas Institution of Engineering and Technology, Mysore, India
reshma127banu@gmail.com, ayanabdulkhader13@gmail.com, arshad712003@gmail.com
mahenml408@gmail.com, raghuraghavendrag14@gmail.com

Abstract: *Enhancing missing person detection is a critical aspect of search and rescue operations, where the use of machine learning algorithms and OpenCV technology. As advancements in technology continue to evolve, the implementation of machine learning algorithms has become a focal point in improving the accuracy and efficiency of missing person detection processes. Additionally, the integration of OpenCV, a library for computer vision and machine learning, further enhances the capabilities of search and rescue systems by enabling real-time image processing and object detection. This comprehensive system combines the strengths of machine learning algorithms and OpenCV technology to create a robust framework for improving search and rescue operations. In this research paper, we delve into the significance of machine learning algorithms in enhancing missing person detection, explore the role of OpenCV in search and rescue operations, and discuss the components of a comprehensive system that integrates these technologies to enhance the efficiency and effectiveness of search and rescue missions.*

Keywords: OpenCV, Machine learning, robust framework

I. INTRODUCTION

The "Missing Person Detection System" is a transformative project at the intersection of compassion and cutting-edge technology in a world driven by technological innovation and a growing need for advanced solutions to societal challenges. This initiative is driven by the critical and time-sensitive nature of locating missing individuals, aiming to redefine the traditional search and rescue paradigm. By incorporating machine learning and facial recognition technologies into a web-based application, this project seeks to expedite the search process while also improving the precision and efficiency of identifying missing individuals. The system encourages public participation by enabling citizens to upload pictures of strangers; if the complaint number matches a reported missing person.

Beyond its immediate functionalities, the project embraces an expansive scope, recognizing the dynamic nature of technological advancements. The incorporation of advanced facial recognition algorithms and machine learning libraries positions the system as a versatile and adaptive tool. Moreover, the forward-looking scope includes potential integrations such as real-time video analysis and mobile applications, reflecting a commitment to staying at the forefront of technological innovation

II. RELATED WORK

The development of our "Missing Person Detection System" is poised to revolutionize the search and rescue paradigm. Leveraging facial recognition technologies, machine learning, and image processing, our system aims to expedite the identification of missing individuals while maximizing accuracy and efficiency

Facial Recognition

Facial recognition technologies serve as the cornerstone of our system, enabling real-time video analysis for swift identification. By adopting advanced algorithms and data fusion techniques, we enhance classification performance and ensure robust recognition capabilities across diverse conditions.

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Image Processing

integrates facial recognition into missing person identification, capitalizing on web camera technology and database comparison to swiftly locate individuals. Real-time data processing and seamless reporting mechanisms to authorities are pivotal features, ensuring timely response and resolution

Machine Learning Applications

Machine learning techniques play a crucial role in refining our system's accuracy and reliability. Through deep transfer learning and comprehensive face cognition mechanisms, we enhance recognition capabilities even with limited datasets, paving the way for high-precision identification

Haar Cascade Algorithm

The Haar Cascade algorithm is a fundamental technique in computer vision, widely used for object detection tasks. It is based on the Haar-like features concept, which involves representing an image as a combination of rectangular regions at different positions and scales. These features are simple, fast-to-compute descriptors that capture variations in intensity within the image.

III. EXPECTED OUTCOME

The expected outcome of the missing person detection system using OpenCV and Python is a highly accurate and efficient tool that can identify missing individuals in real-time, leveraging advanced deep learning algorithms. The system will feature a user-friendly GUI for easy image uploads and live camera feeds, ensuring an intuitive user experience. It will maintain a comprehensive and scalable database, capable of handling large datasets efficiently. The system will be robust against common challenges such as variations in appearance and will implement strong security measures to protect personal data. Additionally, it will offer features like an integrated notification system, analytics and reporting tools, and cross-platform compatibility, making it a valuable asset for law enforcement and public safety agencies

IV. CONCLUSION

In conclusion, the "Missing Person Detection System" exemplifies the intersection of technology and social responsibility, offering an innovative solution to a critical societal issue through Python programming, machine learning, and web development. As we look ahead, the system's potential for growth—including enhanced facial recognition, real-time video analysis, mobile application development, and collaboration with law enforcement—demonstrates our commitment to continuous improvement. We are proud to have developed a project that highlights technological innovation, collaboration, and a shared vision for addressing real-world challenges

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