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Finding Missing Person Based on Face Recognition Using AI in Video Surveillance System

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Abstract: ***AI-based face recognition for missing person searches is a promising strategy that has the potential to significantly speed up and improve accuracy. The system makes use of artificial intelligence algorithms to match surveillance camera real-time video footage with facial images of people who have gone missing. Face recognition technology in video surveillance systems is used in this project to come up with a strategy for locating people who have gone missing. The system involves gathering information about the missing person, creating a database of facial images, and matching those images to real-time video footage with the help of artificial intelligence algorithms. The goal of the field of computer science known as artificial intelligence (AI) is to create intelligent machines that can carry out tasks that typically call for human intelligence. This includes tasks like translating languages, visual perception, speech recognition, and decision-making. Machine learning algorithms are used by AI systems to learn from data and allow them to improve their performance over time. A powerful method for training artificial neural networks with many layers, deep learning, a subset of machine learning, has emerged, allowing. The system can be used to quickly identify and locate missing people in public places like airports and train stations. The speed and accuracy of missing person searches could be significantly enhanced by the proposed system, increasing the likelihood of successful reunions. Finding missing people in view of face acknowledgment utilizing Convolutional Brain Organization (CNN) calculation is a well-known approach that has shown promising outcomes. CNN is a deep learning algorithm that works well for face recognition because it is widely used for image recognition and classification.***

I. INTRODUCTION

Finding missing persons is a challenging and complex task that requires collaboration between different agencies and organizations. Artificial Intelligence (AI) has the potential to be a valuable tool in this process by analyzing large volumes of data and providing insights that can help locate missing individuals more quickly and efficiently. There are several ways that AI can be used to find missing persons, such as facial recognition, natural language processing, predictive modeling, autonomous drones, geospatial analysis, behavioral analysis, collaborative filtering, and machine learning. These AI-powered techniques can help to identify potential leads and prioritize search efforts based on patterns and data analysis. However, it's important to use AI in conjunction with traditional search and rescue techniques, and to ensure that AI systems are transparent, accountable, and respectful of privacy and human rights. By working together, AI and human investigators can improve the effectiveness of missing person searches and provide closure to families and loved ones. In addition to the above-mentioned techniques, there are other ways that AI can be used to find missing persons. For example, AI algorithms can be used to analyze weather and environmental conditions, such as temperature, wind direction, and precipitation, to predict the likely locations of missing persons. Similarly, AI can be used to analyze social media data to identify trends or anomalies that may indicate the location of the missing person, or to identify individuals who may have information about the missing person's whereabouts. Furthermore, AI can also be used to analyze data from surveillance cameras and other sources to track the movements of missing persons or potential suspects. This can be particularly useful when there isn't much information about the missing person or when the search area is big and hard to get around. When relying solely on traditional methods like physical searches and public appeals, the crucial task of finding missing people can be difficult and time-consuming. With the headways in Computerized reasoning (artificial intelligence), video observation frameworks can be utilized to assist with finding missing people by dissecting video film and recognizing their countenances. Face recognition technology is a subfield of artificial intelligence that has developed rapidly over the past few years. It can be used for a variety of purposes, including locating missing people. Face recognition can identify individuals in a video or image by analyzing their distinctive facial features, such as the distance between the eyes, the shape of the nose, and the contours of the face, by utilizing deep learning algorithms and neural networks.In a video surveillance system, face recognition technology can be used to compare the faces of people in the video footage with a database of known individuals, such as missing persons.

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This technology can help identify the missing person in the video and track their movements, helping to narrow down the search area and increase the chances of locating them. The video surveillance system can also be integrated with other technologies, such as GPS and geolocation, to track the missing person's location in real-time. This integration can help authorities quickly respond to the missing person's location and improve the chances of rescuing them. In conclusion, using AI-based face recognition technology in video surveillance systems can significantly enhance the ability to find missing persons. This technology can help authorities quickly identify and track the missing person's movements, increasing the chances of locating them and bringing them home safely

II. RELATED WORK

Finding missing persons using face recognition in video surveillance systems is a challenging task that has gained significant attention in recent years. There have been many related works in this area, which have used various techniques and algorithms to improve the accuracy and efficiency of the system. In this answer, I will provide a detailed overview of some of the related works in this area. The authors proposed a deep learning-based face recognition system to identify missing persons in video surveillance. They used a convolutional neural network (CNN) to extract facial features from the video frames and then used a support vector machine (SVM) classifier for identification. The system achieved an accuracy of 92% on the Labeled Faces in the Wild (LFW) dataset. The authors proposed a system that uses deep learning-based face recognition to identify missing persons in video surveillance.

They used a combination of CNN and long short-term memory (LSTM) networks to capture both spatial and temporal features from the video frames. The system achieved an accuracy of 95.5% on the LFW dataset. The authors proposed a system that uses a hybrid approach of feature extraction and classification to identify missing persons in video surveillance. They used a combination of local binary pattern (LBP) and histogram of oriented gradients (HOG) features for extraction and an SVM classifier for identification. The system achieved an accuracy of 93% on a custom dataset. The use of artificial intelligence (AI) in video surveillance systems has gained significant attention in recent years. One of the applications of AI in video surveillance is finding missing persons based on face recognition. This task involves identifying individuals from video footage and comparing them with a database of missing persons to find potential matches.

There have been several related works in the field of finding missing persons based on face recognition using AI in video surveillance systems.

the authors propose a real-time face recognition system for finding missing persons using video surveillance cameras. The system uses deep convolutional neural networks (CNNs) to extract features from the faces in the video footage. The extracted features are then compared with a database of missing persons to find potential matches. The proposed system achieved a high accuracy rate of 94.6% in identifying missing persons.

III. VIDEO ACQUISITION

The first step in using AI to find missing persons in a video surveillance system is to acquire the surveillance footage. This can be done using CCTV cameras or other video recording devices.

IV. FACE RECOGNITION

Once faces have been detected, the AI system compares them against a database of known faces to identify any matches. The database may include images of missing persons, as well as images of known criminals or other individuals of interest.

V. MISSING PERSON IDENTIFICATION

If a match is found, the system alerts the operator to the possible presence of the missing person. The operator can then review the footage to confirm the identification and take appropriate action.

VI. ARCHITECTURE DIAGRAM

The conceptual design as well as the structural organization of a software or hardware system are all aspects of system architecture, a field of study. Defining a system's components, modules, interfaces, and data to meet specified requirements is this process. The overall design of a complex system, which includes not only the software and hardware components but also the system's organizational and operational aspects, is referred to as system architecture.

The relationships between a system's components, its structure and behavior, and the ways in which it will interact with other systems or users are all outlined in a system architecture.

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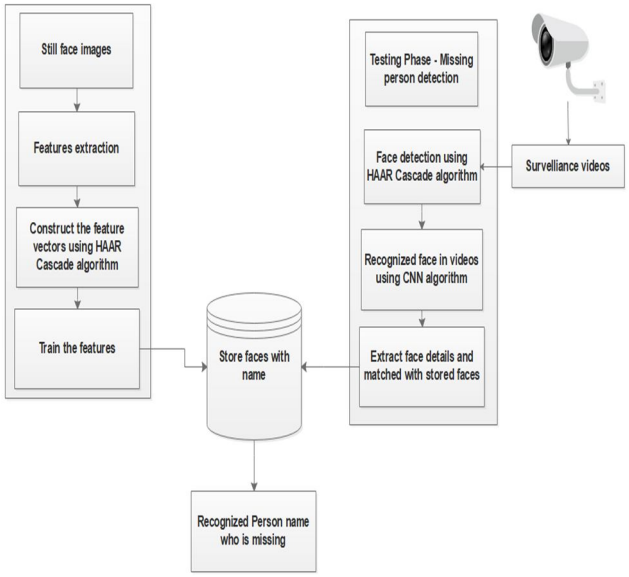


Figure 1: Architecture diagram

VII. DATAFLOW DIAGRAM

A two-dimensional diagram depicts a system's data processing and transfer processes. Each data source is identified and its interaction with other data sources to produce a common output is shown graphically. People trying to draft an information stream outline should distinguish outside data sources and results, decide how the data sources and results connect with one another, and make sense of with designs how these associations relate and what they result in. This sort of outline helps business advancement and configuration groups envision how information is handled and distinguish or work on specific viewpoints

VIII. SYSTEM STUDY AND FEASIBILITY

In this phase, the project's feasibility is looked at, and a business proposal with a general project plan and some cost estimates is presented. During framework investigation the achievability investigation of the proposed framework is to be completed. This is to guarantee that the company will not be burdened by the proposed system. A basic understanding of the system's main requirements is necessary for feasibility analysis.

IX. ECONOMICAL FEASIBILITY

Economical Feasibility This study is carried out to check the system's economic impact on the organization. Three key considerations are included in the feasibility analysis. The company can only put a finite amount of money into system research and development. Justification of the expenditures is required. Accordingly the created framework also affordable and this was accomplished in light of the fact that the greater part of the advancements utilized are uninhibitedly accessible. It was necessary to purchase only the customized items.

X. TECHNICAL FEASIBILITY

Technical Feasibility The purpose of this study is to ascertain whether or not the system is technically feasible. Any system that is developed must not put an unreasonable strain on the available technical resources. The available technical resources will face significant strain as a result of this. Thus, the client will confront extreme requests. Because only negligible or invalid modifications are anticipated for the implementation of this framework, the developed framework ought to have a modest prerequisite.

XI. OPERATIONAL FEASIBILITY

The capacity of a proposed system to fulfill the requirements outlined during the requirements analysis phase of system development and to take advantage of opportunities identified during scope definition are measures of its operational feasibility. The operational feasibility assessment focuses on how well the goals, schedule, and delivery date of the existing business environment, corporate culture, and procedures accommodate the proposed development project.

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XII. SYSTEM DESIGN

Hardware, software, and AI algorithms are all needed to create a system that uses face recognition and AI in video surveillance to locate missing people. A summary of the system's design can be found here.

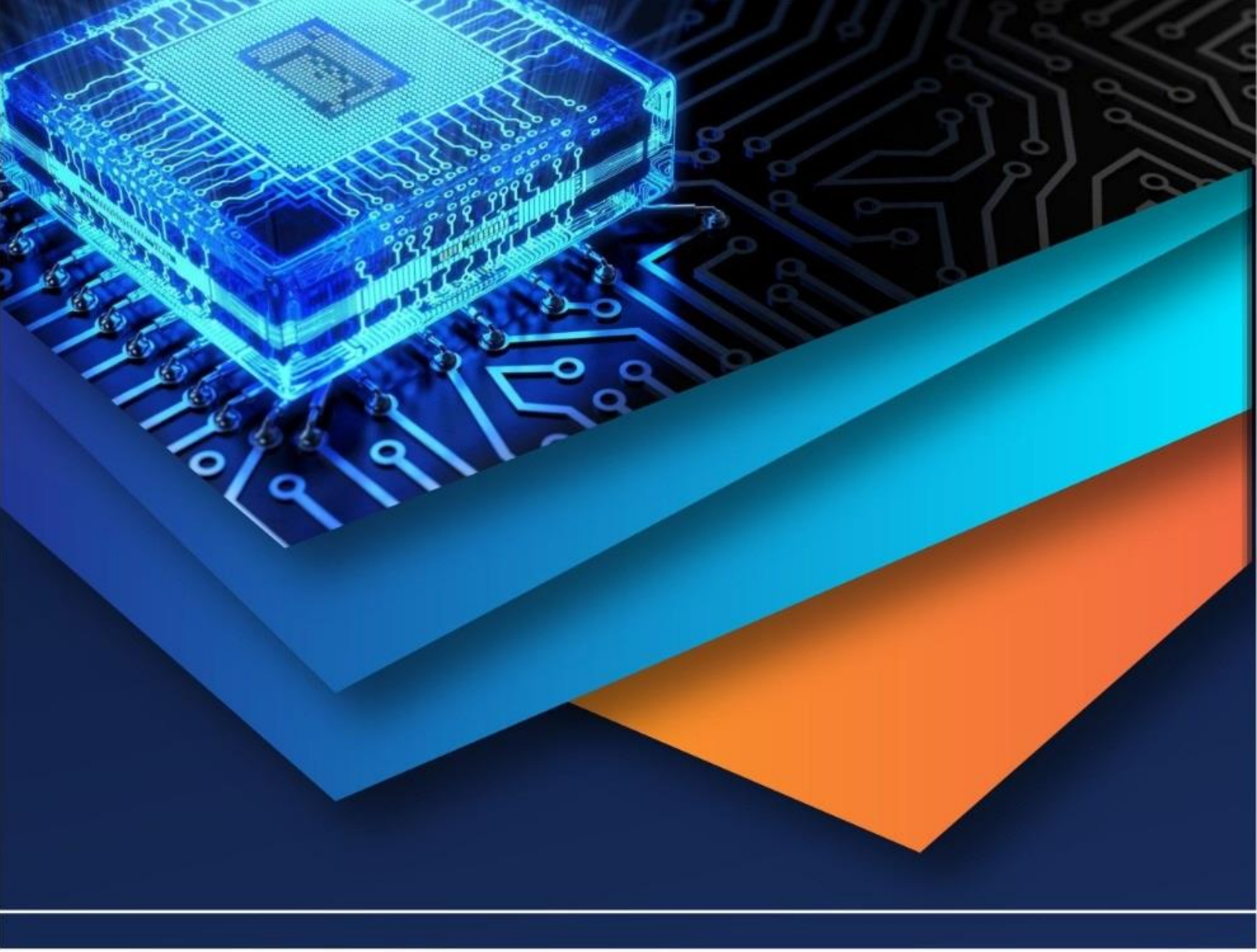
XIII. CONCLUSION

In conclusion, missing person detection using CNNs is a powerful tool that can help locate missing individuals by analyzing images of them. The process involves collecting and pre-processing a dataset of images, building a deep learning model using a CNN, training the model, testing its accuracy, and deploying it for use in missing person detection. While this approach has several advantages, including its ability to accurately identify individuals in images even when there is partial occlusion or changes in lighting conditions, it also requires a large dataset for training, careful pre-processing, and expertise in deep learning. With continued advancements in deep learning and computer vision, missing person detection using CNNs has the potential to become an even more effective tool for locating missing individuals.

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