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

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ABSTRACT: Finding missing persons based on face recognition using AI is a promising approach that can significantly improve the speed and accuracy of missing person searches. The system involves using AI algorithms to match facial images of missing persons with real-time video footage from surveillance cameras. This project proposes a method for finding missing persons using face recognition technology in video surveillance systems. The system involves collecting data about the missing person, building a database of facial images, and using AI algorithms to match those images with real-time video footage. Artificial intelligence (AI) is a field of computer science that aims to develop intelligent machines that can perform tasks that typically require human intelligence. This includes tasks such as visual perception, speech recognition, decision-making, and language translation. AI systems are designed to learn from data, using machine learning algorithms that allow them to improve their performance over time. Deep learning, a subset of machine learning, has emerged as a powerful technique for training artificial neural networks with many layers, enabling AI systems to recognize complex patterns and make accurate predictions. The system can be implemented in public spaces, such as airports and train stations, to quickly identify and locate missing persons. The proposed system has the potential to significantly improve the speed and accuracy of missing person searches, thereby increasing the likelihood of successful reunions. Finding missing persons based on face recognition using Convolutional Neural Network (CNN) algorithm is a popular approach that has shown promising results. CNN is a deep learning algorithm that is widely used for image recognition and classification tasks, making it suitable for face recognition.

KEYWORDS: CNN, Artificial Neural Network, Face Reorganization, NLP, ML, Surveillance Video Acquisition

I. INTRODUCTION

AI (artificial intelligence) is the simulation of human intelligence processes by machines, especially computer systems. These processes include learning (the acquisition of information and rules for using the information), reasoning (using rules to reach approximate or definite conclusions) and self-correction. Particular applications of AI include expert systems, speech recognition and machine vision. AI can be categorized in any number of ways, but here are two examples. The first classifies AI systems as either weak AI or strong AI. Weak AI, also known as narrow AI, is an AI system that is designed and trained for a particular task. Virtual personal assistants, such as Apple's Siri, are a form of weak AI. Strong AI, also known as artificial general intelligence, is an AI system with generalized human cognitive abilities so that when presented with an unfamiliar task, it has enough intelligence to find a solution. The Turing Test, developed by mathematician Alan Turing in 1950, is a method used to determine if a computer can actually think like a human, although the method is controversial.

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TECHNOLOGIES IN AI

Automation: What makes a system or process function automatically. For example, robotic process automation (RPA) can be programmed to perform high-volume, repeatable tasks that humans normally performed. RPA is different from IT automation in that it can adapt to changing circumstances.

Machine learning: The science of getting a computer to act without programming. Deep is a subset of machine learning that, in very simple terms, can be thought of as the automation of predictive analytics. There are three types of machine learning algorithms:

Supervised learning: Data sets are labeled so that patterns can be detected and used to label new data sets

Unsupervised learning: Data sets aren't labeled and are sorted according to similarities or differences

Reinforcement learning: Data sets aren't labeled but, after performing an action or several actions, the AI system is given feedback

Machine vision: The science of allowing computers to see. This technology captures and analyzes visual information using a camera, analog-to-digital conversion and digital signal processing. It is often compared to human eyesight, but machine vision isn't bound by biology and can be programmed to see through walls, for example. It is used in a range of applications from signature identification to medical image analysis. Computer vision, which is focused on machine-based image processing, is often conflated with machine vision.

Natural language processing (NLP): The processing of human -- and not computer -- language by a computer program. One of the older and best known examples of NLP is spam detection, which looks at the subject line and the text of an email and decides if it's junk. Current approaches to NLP are based on machine learning. NLP tasks include text translation, sentiment analysis and speech recognition.

Robotics: A field of engineering focused on the design and manufacturing of robots. Robots are often used to perform tasks that are difficult for humans to perform or perform consistently. They are used in assembly lines for car production or by NASA to move large objects in space. Researchers are also using machine learning to build robots that can interact in social settings.

Self-driving cars: These use a combination of computer vision, image recognition and deep learning to build automated skill at piloting a vehicle while staying in a given lane and avoiding unexpected obstructions, such as pedestrians**.**

II. EXISTING SYSTEM

Reports of missing persons worldwide have increased significantly in the past recent years, from roughly 450,000 in 1990 to about 10,000,000 this year. The increase was driven in part by the ever-growing population. The numbers indicate that more people are becoming victims each day. An astounding 2,300 Americans are reported missing every day, including both adults and children. More recently, the abductions of children and adults have reawakened public concern about missing people. In most parts of the world, the police and non-governmental organizations working with missing people have recently reviewed their policies and are planning to improve coordination of their work. People end up missing in different scenarios. The circumstances that may lead adults or children to become missing people are often complex and multi-layered. The missing phenomenon is best understood as a continuum in which a break in contact may be either intentional or unintentional. Some people make a conscious decision to leave, albeit often not in circumstances of their own choosing, while others may drift apart from family members over time. Some may never have intended to be missing, and indeed may not conceptualize their experience in these terms, while others may be forced apart through the actions of others. Some of the causes entailed herein are natural disasters, psychological complications, abduction and domestic conflicts. Manual System for finding missing person have very long procedure and takes more time. More time is required for launching an FIR (First Information Report) in police station. Also, time required for finding lost person is more. Also, during manual process amount of manpower for searching lost person is less. Some existing application does not show the proper information about the Missing person, which is difficult to find out missing person. Some missing person related website only shows the database of missing person.

DISADVANTAGES:

- Physically it takes huge time, as it is lengthy procedure for finding missing person as it increases time to launch an FIR in police station.

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- Also, during handy process workforce for searching missed person is not so great and due to this half of the cases remain mysterious.

2.2 PROPOSED SYSTEM

In today's world, where kidnapping and human trafficking never fails to grab the headlines, biometrics, especially facial aspects of the person become the most crucial assets to trace the person. Whenever suspicious people are found to be doing laborious tasks in places they should not be, it ignites a spark of doubt in the minds of common citizens that whether the person belongs to that occupation. But due to lack of resources or the proper means of acquiring knowledge about the same, the common citizens fail to turn into vigilant citizens of the nation. This leads to the sacrifice of thousands of people daily due to the sheer negligence of the citizens. If only each citizen had the authority or the privilege of saving these people, the world would have prospered with every citizen taking the charge of every nation. There is an urgency to stop the various cases of kidnapping, trafficking, prostitution and all other illegal activities where people are being forced without any hope of help. This project proposes a system that would help the police and the public by accelerating the process of searching using face recognition. When a person goes missing, the people related to that person or the police can upload the picture of the person which will get stored in the database. In proposed system detect and recognize the faces by using Eigen object detector algorithm with Deep learning. This can be done with the help of OpenCV with haar cascades which are present in the OpenCV integral. The images which are taken from the camera are detected with haarcascade frontal faces and eyes then trained with CNN algorithm, the trained faces are kept in a database first and equated to the trained images after comparing it will make a log of the system to the recognized persons in surveillance videos.

ADVANTAGES:

- The system is used to identify the missing person in video datasets using HAAR Cascade with deep learning algorithm
- Automatically detect the person faces in video frames
- Accurately match facial features with datasets and provide the alert about missing persons
- Alert can be sent in terms of SMS

MODULES:

- FRAMEWORK CONSTRUCTION
- TRAIN FACE IMAGES
- SURVEILLANCE VIDEO ACQUISITION
- FACE DETECTION
- MISSING PERSON DETECTION
- ALERT SYSTEM

MODULES DESCRIPTION:

FRAMEWORK CONSTRUCTION

Tracking and locating a person automatically in an unconstrained large crowd gathering through face detection and recognition is still challenging. Face detection and recognition is challenging due to various dynamic factors such as low resolution, variable crowd distance from installed cameras, mobility of cameras and the crowd. The image of the individual given by the client at the hour of missing is put away in the data set. General society is offered position to transfer image of any individual in unsure circumstances. Implemented recognition of match for this image among the generally existing image in the data set will be done through our framework. At the point when a dubious individual is found, the image at that case of time is contrasted and the pictures transferred by the authority/police division at the hour of missing through the face acknowledgment model. This research work is proposed for the automated tracking of reported missing person from live videos of unconstrained large gathering. The probability of losing vulnerable companions such as a child or an older person in such large gatherings is high and their automated tracking, using intelligent video surveillance, is an extremely challenging task. The proposed work tries to mitigate this challenging task by dividing the experimented premises into geofences where each geofence is installed with particular cameras.

TRAIN FACE IMAGES

Training a face image for missing person detection involves creating a machine learning model that can accurately recognize the face of the missing person based on the available images or information. Face registration is the process of transforming different sets of data into one coordinate system. Facial features are extracted and construct feature

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vectors with the help of Haar Cascade Algorithm. The missing person images are acquired from predefined datasets that is collected from local and international police departments. Images are trained and labeling with corresponding user information.

- Load the image: Load the image in which you want to detect faces.
- Convert the image to grayscale: Convert the loaded image to grayscale. This is because the Haar Cascade classifier is designed to work on grayscale images.
- Detect faces using the classifier: Use the Haar Cascade classifier to detect faces in the grayscale image. The classifier uses a set of pre-defined features to detect the presence of faces in an image.
- Draw a rectangle around the detected faces: Once the faces are detected, draw a rectangle around each face to highlight the detected region.
- Display the image: Display the original image with the rectangles drawn around the detected faces.

SURVEILLANCE VIDEO ACQUISITION

Surveillance video acquisition can be a useful tool for missing person detection. The first step is to identify the location of relevant surveillance cameras, which could include public spaces, commercial establishments, or private residences. Once the location of the cameras has been determined, it is necessary to obtain permission to access the surveillance footage. This may involve contacting law enforcement or property owners. After obtaining permission, the next step is to retrieve the video footage from the surveillance cameras. This can be done either by physically going to the location of the camera and downloading the footage or by accessing the footage remotely through a network connection. Once the video footage has been acquired, it can be reviewed to look for any signs of the missing person. This may involve using video analysis software to scan the footage for specific characteristics or patterns. By using surveillance video acquisition as a tool for missing person detection, it is possible to gather valuable information that can help in the search and recovery efforts. In this module propose a Surveillance Camera based face detection along with tracking of person. Here uses image processing to detect missing person in Surveillance Camera footage, without the use of sensors. This system concentrates on face detection. The security personnel can be notified about the suspicious person detected using Real-time analysis of the face matching of missing person from. Surveillance Camera footage and thus gives a chance to avert the same.

FACE DETECTION

Detecting faces in videos is a challenging task that involves identifying and tracking faces in a dynamic sequence of frames. The first step in face detection in videos is to load the video file that want to process. Once the video is loaded, frames need to be extracted from the video at a fixed interval to create a sequence of images that can be processed for face detection. The face detection is done by using the Haar Cascade Algorithm. It is an approach based on machine learning that uses a cascade function which is trained from a bunch of positive and negative images. The features from an image are obtained and the parameters should be mentioned with correct values to extract the features. It employs more than one classifier on obtained face images. The extracted features stored as an array of integers with unique value for each feature. The mapping is done by the use of CNN approach.

MISSING PERSON DETECTION

The extracted features of the face are called as a face print or feature vector or simply a template. It will compare the two faces by the similarities of their features. Here utilize the features of CNN for classifying images. CNN has multiple layers of functions to accurately classify the images with dataset. Based on the similarities the matching is calculated. Based upon the result of template matching the final decision is made to determine whether the suspect is identified or not.

ALERT SYSTEM

When a match is found, the user will get a notification on his/her number. Notification sections displays that the message has been sent to the user successfully.

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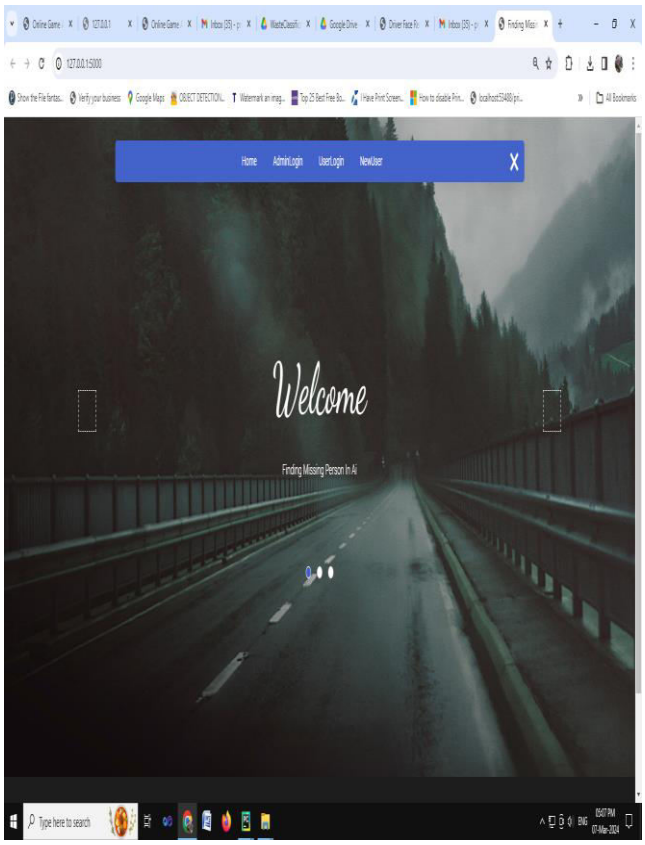
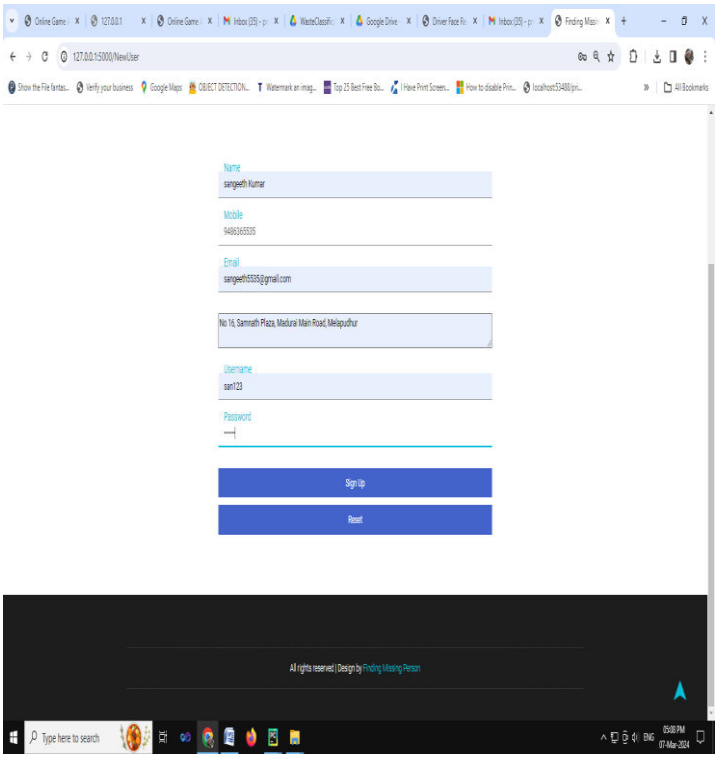
HOME PAGE



NEW USER REGISTERATION



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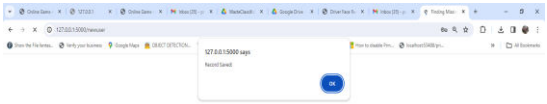

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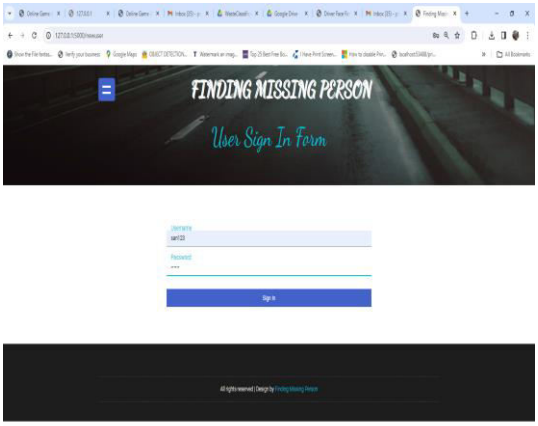

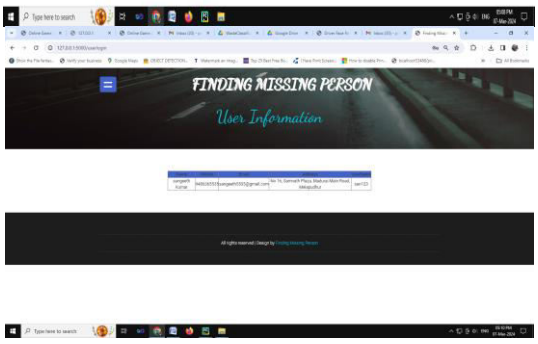

USER INFORMATION

III. CONCLUSION

In conclusion, missing person detection using CNNs is a powerful tool that can help locate missing individuals by analysing 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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IV. FUTURE WORK

One challenge in missing person detection is the availability of high-quality datasets. Future work could focus on improving the quality and size of available datasets to improve the accuracy of the models. Missing person detection often involves analyzing images or videos taken at different times. Future work could focus on incorporating temporal information into the models to improve their ability to track individuals over time.

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