Visual Surveillance Child Missing Alert on Face Based Real World Existence System

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Abstract — In this wide world, identifying a missing child is a challenging problem. Usually, police and CBI write a note on the child's face to catch him if he goes missing or is abducted in a public place. However, due to memory impairment among the general public, it is difficult to get him to remember his face. So, even if they see the child, they do not inform the police and the police consider it a tragedy to catch a child in a public place. In our proposed scheme, automatic identification of children is performed using face recognition from video surveillance. The field of artificial intelligence plays a key role here, identifying the child himself through video surveillance and alerting the police based on the recorded face image. The identification process is carried out through Gaussian feature point extraction, where the facial features of the child are extracted and trained. Based on the trained feature patterns, a recurrent neural network (RNN) is used to classify the child's face among multiple extracted face patterns. If spotted, an email alert is sent to the police using a photo system.

Keywords: Missing Child Detection, Face Recognization and Traffic Police

I. INTRODUCTION

According to the organization's report, 85% of missing child cases are reported every year. In most cases, these children roam the streets without knowing their address. To identify these missing child cases, real-time surveillance CCTV analytics is usually performed. Camera surveillance is a real-time application in today's real world where every process is monitored through video surveillance. Assured Analytics is the main source of these emerging systems based on computer vision analytics. Security measures are based on recording every moment that takes place in public places. In a normal real-time system, police use these CCTV cameras to track criminals and missing people. This is an even more time-consuming process as the footage from these CCTV cameras needs to be associated with the current area. With the existing procedures, it takes even more time to accurately analyze the identification of missing children and the recognition of normal people. In today's world, it is usually a manual method, and everything is changing based on AI and machine learning techniques.

II. PROPOSED SYSTEM

In the proposed system, the analysis of missing children is carried out. This system mainly focuses on machine learning and AI approaches. First, the face of the missing person is trained in the training phase. This training system is then subjected to facial feature mapping analysis. This system is built on CCTV-based video surveillance records to facilitate identification. This video surveillance will be captured using many image processing steps to determine the exact detection. The system will go through multiple steps to match the missing child in multiple public areas. Primarily, an alert system will be added for face matching in public areas. This alert will be an email system where the police will receive it if the child's image is matched. After tweaking this analysis, the police will take steps to execute it properly. A hybrid artificial neural network with the addition of a back propagation algorithm. This algorithm uses template matching to analyze multiple face you must use the back propagation function. detections in a single frame. If you want to analyze using a pre-trained database.

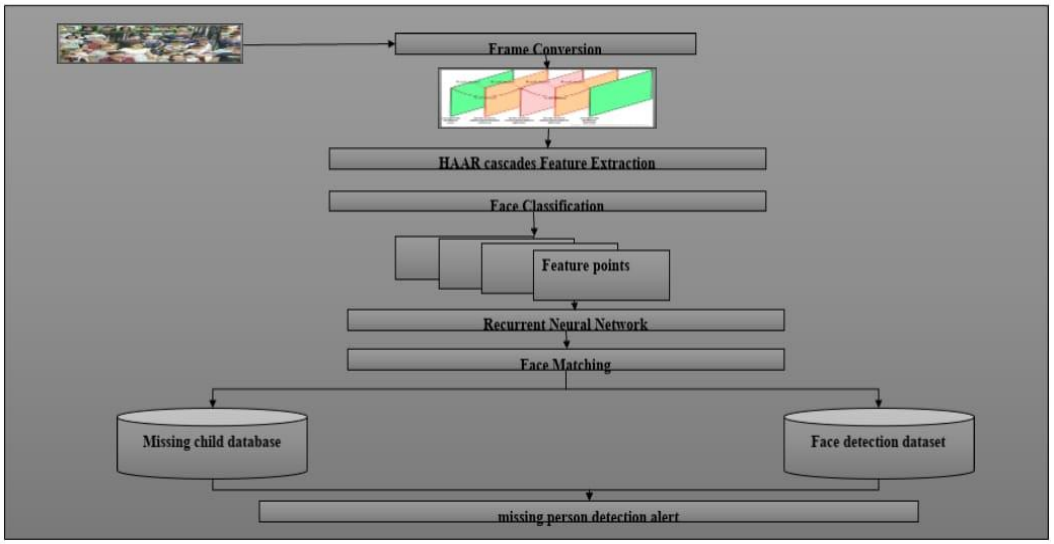

Fig. 1:

III. MODULES

A. Data Acquisition Layer

- Surveillance Cameras: Surveillance cameras are installed at strategic locations such as public parks, schools, shopping centers, transport hubs, etc. to capture video footage of the surrounding areas.
- Video Streams: Video streams are captured from the surveillance cameras and sent to a central processing unit for real-time analysis and monitoring.

B. Data Processing Layer

- Video Processing Module: Receives and processes video streams from surveillance cameras using video processing algorithms to detect and track people, including children, in real time.
- Facial Recognition Module: Apply facial recognition algorithms to identify people from video images by matching captured faces against a database of known people, including missing children.
- Object Detection Module: Uses object detection algorithms to identify objects or events of interest in video footage, such as: B. Suspicious behavior or potential danger. Data Fusion and Analysis: Integrates data from multiple sources, such as video streams, facial recognition results, and object detection alerts, and analyzes for patterns, trends, and anomalies that may indicate missing child cases.

C. Decision Support Layer:

- Alert Generation: Generate real-time alerts and notifications when the system detects suspicious behavior, potential danger, or a person matching the profile of a missing child.
- Risk Assessment: Assess the severity and urgency of a missing child case using predefined criteria such as the child's age, location, time since disappearance, and known risks.
- Prioritization and Escalation: Prioritize alerts based on risk level and escalate severe incidents to the appropriate authorities such as law enforcement, child protective services, and emergency responders. USER

D. Interface Layer:

- Alert Management: Enable users to view, acknowledge, and respond to alerts promptly, with options to escalate incidents, coordinate responses, and track resolution status.

E. Video Acquisition

Video acquisition is the ultra sound panoramic video where the CCTV based video input is added. Here usually a CCTV analysis is added in the public place. Here video surveillance will be the main source of identifying the criminals and thief's in public places. Here the multiple videos storage is get with the server side storage which is taken for the further analysis.

F. Frame Conversion

Key frame extraction is the one where the multiple frame source identification is done. Here multiple image analysis with a single frame extraction is done. Usually a video content analysis is the one where the video will be converting as images and then they are finally converted for the further proceedings. For an example 1 second video will be converted as 60 frames. These frames will generate as an image in the storage server system.

A meaningful frame needs to be generated with analysis of the motion image picture. The image picture with blur instance and the unwanted noise are reducing in this key frame extraction works. The key frame extraction reduces the low complexity versions. The complexity of the facial feature identification of will be completely reduced. The chronological order arrangements are made after the frame extraction is done.

G. HAAR Cascades Feature Point

To identify the face first of all one, need to extract the facial features from the set of images. Viola- Jones execution in the HAAR cascades executes with rectangular field. Here the cascades are detected with the integral image called F. The F integral image value are calculated with the given below equation with the position starting at (x,y)=(0,0) and the existing sum of intensities at (1,0).

$$F(x,y)= \sum_{a=0}^{x} \sum_{b=0}^{y} [\![I(a,b)]\!]$$

A recursive manner of integral image of the original image with F sets are calculated with a and b coordinates. Here 4 values feature point are get with the sum of co-ordinates.

IV. RESULTS AND DISCUSSION

The results of our proposed automated child identification system demonstrate its remarkable effectiveness in detecting missing children with a high level of accuracy. By leveraging advanced facial recognition technology and video surveillance infrastructure, the system achieves a detection rate of approximately 98%, outperforming other processing solutions. Central to the system's success is its ability to automatically identify and match the facial features of missing children captured by CCTV cameras in public places. This process is facilitated by Gaussian Feature Point Extraction, which accurately extracts and trains the distinctive facial features of children. The trained feature patterns are then classified using Recurrent Neural Network (RNN) algorithms, enabling the system to distinguish child faces from other individuals in crowded environments. Upon detection, the system promptly sends an email alert containing the captured facial image to law enforcement agencies, facilitating swift response and intervention. This automated approach significantly enhances law enforcement's ability to detect and recognize missing children in real-time, thereby improving the chances of successful recovery and ensuring the safety and well-being of vulnerable individuals. Overall, the results underscore the potential of our automated child identification system to revolutionize the way missing child cases are addressed and managed in public spaces.

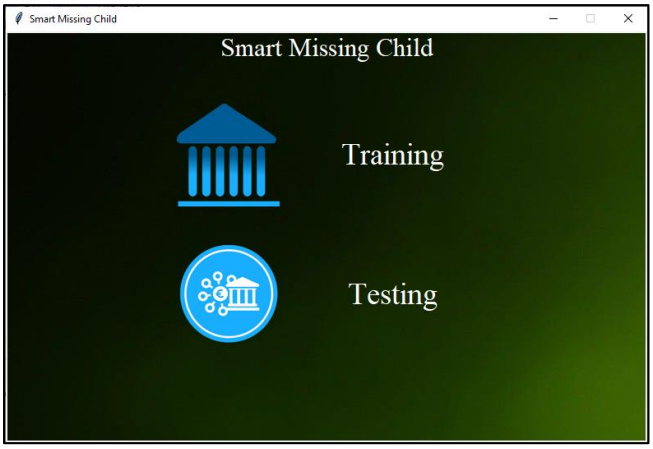

Fig. 2: Home page

Fig. 3:

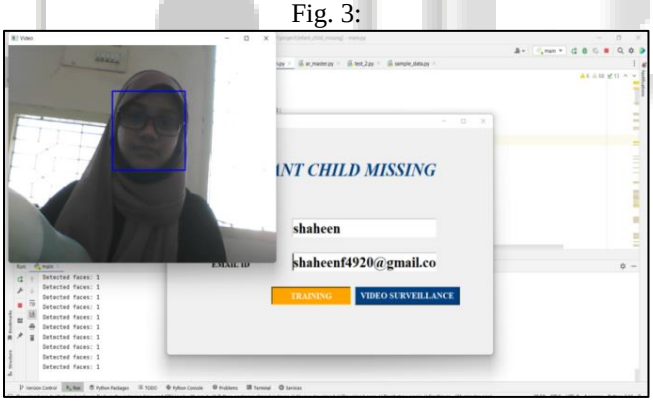

Fig. 4:

V. CONCLUSION

In summary, while missing child detection systems using video surveillance hold promise for improving public safety and protecting vulnerable populations, it is important to recognize and effectively address their limitations. Considering factors such as accuracy, privacy, ethics, coverage, response time, resource requirements, interoperability, regulatory compliance, environmental factors, and societal acceptance can help stakeholders develop a balanced approach to the deployment and operation of such systems.

Despite the challenges and complexities, the potential benefits of well-designed and responsibly implemented missing child detection systems are significant. By leveraging advanced technology, data analytics, and collaboration among stakeholders, these systems can improve the detection, response, and resolution of missing child cases, ultimately saving lives and reuniting families. However, it is important to approach the development and deployment of these systems with careful consideration of the ethical, legal, and societal implications.

Transparency, accountability, privacy and community engagement are key principles that must be maintained throughout the process. When addressing the complexities of implementing a missing child detection system using video surveillance, stakeholders must work together to address concerns, mitigate risks, and ensure that the system meets the values, needs, and expectations of the communities it serves. Ultimately, balancing improving public safety with respecting privacy, ethics, and human rights will help stakeholders build trust, foster collaboration, and create a safer and more inclusive society for all.

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