iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 12 **Issue:** V **Month of publication:** May 2024

DOI: https://doi.org/10.22214/ijraset.2024.61771

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 12 Issue V May 2024- Available at www.ijraset.com

Child Missing with Surveillance Analysis with Multi Phase Extraction Face Monitoring

Mrs. S. Latha[1], Mr. K. Manoj[2], Prakashraj J[3], Praveen Nath E[4], Santhosh M[5], Subash S[6]
[1, 2]*ASP/IT, Mahendra Engineering College, Namakkal*
[3, 4, 5, 6]*Students of Final year IT, Mahendra Engineering College, Namakkal*

Abstract: ***Visual Surveillance has been placed in everywhere for any incidents identification. With the wide developments missing child identification with the computer vision system is the main focus. The implementation carried out with face based detection with rapid advance digital connectivity. Face recognition plays as a major developmental process where the concern person can be identified with face based identification system. Machine learning with artificial intelligence plays a vital role in facial detection and recognition. The paper proposes Haar Cascade on feature extraction from facial points and Hybrid Recurrent Neural System(HRNN) with Long Short Term Memory(LSTM) algorithm, on multi face recognition over public crowded area. Missing child images will be pre- trained in a database where the face matching templates will be provided. On matching the database labeled points with the feature point an E-mail or SMS based alert system can be generated on notification to the authority with cam points. Thus the development carried will give best accuracy solution on finding out from multiple face regions. Mainly identification of the missing child over the road side areas will be done with computer vision frame targeting system.***

Keywords: Visual Surveillance, Computer Vision, Face Recognition, Facial Detection, Face Matching Template, Hybrid ANN, Back Propagation, Feature Extraction, Labelled points.

I. INTRODUCTION

An organization report shows that 85% of child missing cases filed per year. Mostly these children might be roaming on road side without knowing their address. To identify these missing child problems usually a real time monitoring CCTV analysis is done. Cameras Surveillance is the real time application in the current real world where each and every process are get monitored by the CCTV. Secured analysis is the main source of these upcoming systems based on the computer vision analysis. Security event is based on capturing each and every moment which are going on in public.

In the normal existing system, using this surveillance camera the police will trace the guilt or missed person. This will be more tedious process where the identification of these CCTV footages with current area. The existing process will take much more time in correct analysis of the missing child identifications and a normal person detection. It is usually a manual method in the current world where each and everything has been changed based on AI and machine learning techniques.

Facial Recognition is the wide used technology everywhere. Now a day's smart phone authentication system are completely done using face recognition. Thus these implementation combined with machine learning and AI based identification tends to upgrade our developed application. Among multiple biometric techniques the provided facial recognition will be the most efficient one where the detection of faces can be exactly identified and produced.

Usually a video based analysis is only done which will be done with computer vision domain. Computer vision is nothing but the analysis of the image processing for further identification. Multiple techniques are done with the image based detection called as image processing. These techniques evolve the outcome of the implemented application. A quick search of the suspected person will be done with the generated computer vision techniques. Generated verification of default server connection for the trained features is added. So, the identification of the suspected person matching and classification will be easier.

Multiple dataset facial images are getting trained for the detection of the facial matches and extract the feature points. These trained dataset gives the multiple point analysis over these filtered images. Furthermore techniques enhance for the exact and accurate analysis of the proposed system.

II. LITERATURE SURVEY

In [1] a syntactic presentation of the facial matching features has been added with the developed system. Here Weiping Chen; Yongsheng Gao has presented a string identification of the matrix feature with face recognition. The demonstration of each image with the matrix sequence will be stored in an array called string values.

©IJRASET: All Rights are Reserved

These array features are then tends to be matched with the higher feature value which all tends to give out a good level of the recognition system. A Face sketch is provided in order to tick out the exact facial features which are meant to be. The sketch face generated with the hyper feature point which are stored in the string format. The background study tends to find out the higher level of the identified points with its matching frequencies. Here matching mechanism of the string face extraction and eigen face extraction are compared and studied.

In [2] Jun-Yong Zhu; Wei-Shi Zheng; JianHuang Lai; Stan Z. Li has developed transduction face matching with IR cameras. Multiple effective databases will be generated with the base of the detected faces. The effective identification from the user side will be more effective compared with the functional differences. Existing classifiers will have many counterparts and the classification of these counterparts is learned with the ensemble analysis.

Renliang Weng; Jiwen Lu; Yap-Peng Tan in [3] explains the identification of the robust face detection over cover of the partial face identification. Multiple gallery images with multiple faces are gathered with the allotment of the partial face recognition system with the generated image. Here a multiple analysis system will be chosen where the aligned pair of extracted feature are said to be given in a place where multiple morphology have been set. This calculation divides the ideology and the accuracy of the system.

In [4] an image processing domain based transfer learning pattern with cross identification of the faces has been developed by Himanshu S. Bhatt;Richa Singh;Mayank Vatsa;Nalini K. Ratha. This author provides a facial recognition system with cross feature pattern extractor which brings out many patterns to get matched with. The detection over these exact transfers learning provides a machine learning approach to make the system to learn the provided details.

In [5] Himanshu S. Bhatt Indraprastha has proposed discriminate feature analysis. Here the complete face matching with the descriptor identified is done with the pixel variation analysis. The main thing here for the face recognition here is that the binary code feature extractor. The difference of the binary code extractor tends to produce the complete feature analysis. The analysis of the multiple dataset provides a good result with the developed research.

In [6] S. Satoh has proposed a sequence analysis of the face extraction which tends to give out from the video. A key frame Extraction technique has been generated with the extracted with multiple level of face content detection. Here mainly pattern recognition tends to give out the identification of the user face sequences matching. The research performance analysis is done in the drama video execution.

In [7] Ahmad Zarkasi; Siti Nurmaini has generated a face moment identification system which will be the most significant one. Here the first dynamic face detection on video analysis is proposed with the motion picture. The input image pattern is detected with the template matching algorithm on each template the variation detection. The coordinates of each face regions are identified with the generated template matching.

In [8] real time face detection for the child identification has been developed by the Imasha Lakshan; Lumini Wickramasinghe the predictor concentrates on the reliability of the person prediction. The machine learning based IOT headband with truth or lie detector is used. This headband identifies the generated details are true or lie. The authenticity of the given emotions with the reliability is high in the experimental results.

In [9] M Hanuma Teja has detected the real live face with Direct Cosine Transform a single camera image acquisition source. Multiple color transformation has been generated with feature extractor. Morphological operations have been enabled with the analysis of the face descriptor. Mainly the DCT algorithm checks the eye blink pattern, face eyebrows, pupil, nose pattern, jaw pattern and the mouth pattern. With the extracted multiple patterns these faces are known to the author.

In [10] Ubon Thongsatapornwatana; Woraphon Lilakiatsakun dedicated with the intelligent transportation system which holds the vehicle movement detection. Here the suspect vehicles with their child kidnapping activities are completely detected where the analysis of the suspects will be known with the vehicle activity. Here a simple CCTV analysis will be generated to detect the suspicious vehicle moment detection and the identification of the criminal or child missing. The accuracy rate of 17.24% is provided in the counterpart area.

In this survey paper [11] the author clearly concentrated on the location tracking of the child for safety purpose with the device. Location tracking is done with Global Position Monitoring (GPS) system where the device gets connected to the concern child. The configuration setup completely focused on the identification of the child with a call and SMS services where the missing child can be easily tracked. The device comprised with a SOS button with emergency case help and the low battery warning alert for the user and the parents. The research article focus on using a device based extraction using Internet of Things
(IOT) system where the complete data maintenance done with microcontroller connectivity. The methodology implemented on using Route Deviation Detection (RDD) where the route differentiation will be analyzed and alerted to the parent. Thus the deviation pattern is analyzed with API key generation in Google map.

©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |

Integrating the developmental feature planning of the exact maintenance is enhanced in the device. But on real time environmental study mostly child cannot carry out device with them or sometimes they may lose the device. Thus a better idea of the system can be implemented over a lost child. Thus some more identification methodology needs to be developed over missing child identification in public places.

The author in [12] clearly depicts the missing children identification system with deep feature matching system. Mostly in existing system face based biometric system is done. Using out that existing papers face matching based missing child identification in public places is done. The author uses out HAAR cascade feature extraction which gives a good recognition of human face with Adaboosting classification algorithm. Pre-processing techniques places a vital role on reducing the complexity of the person face identification system. Trained database with the missing child images is created as a labeled dataset where the testing is done with image based matching extraction system. Classification done using cascade and adaboost makes a low level of accuracy system. Thus a cascading method can be changed in our proposed solution.

Multiple face detection has been deployed in paper [13] where the face matching with multiple face extraction. Here a network structure based deep convolution data augmentation is done for the face detection of the concern person. Multitask Cascaded Convolution Neural Network (MTCNN) makes a good accuracy system compared to all other solutions. The concern authors prove 92% accuracy extraction on using MTCNN.

Bounding box extraction is done with the video surveillance frames where multiple video ensembling faces might be shown. Thus identification of the exact face from the trained dataset is done with the bounding box data modeling. Thus this makes a wider angle development of identifying the face in public places. The execution and the development forwarded to get a hybrid developmental method on using some trained functionality features on increasing the accuracy.

III. EXISTING SYSTEM

In the existing system, Convolution Neural Network based face spoofing on stereo matching has been developed. A disparity map has been generated for the stereo mapping of the face spoofing detection. Single image analysis with the large scale matching will be the more complexity one. So to reduce the complexity multiple images on left and right has been added as a binocular pattern.

Generally this involvement of the CNN stereo matching system given with three methods: Feature Extraction, Cost effective volume and the 3D- CNN classification of the spoofing of the person in the face matching identification system.

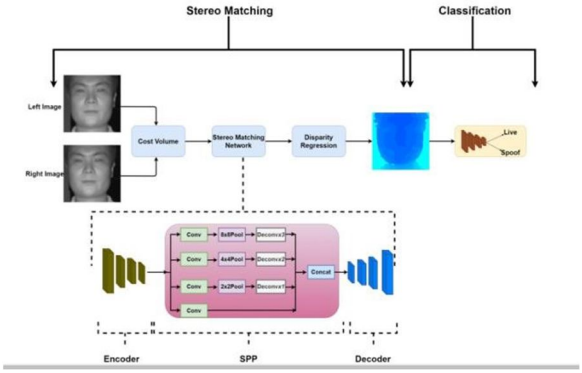


Fig 1 Architecture of the existing system

Each structure of the multiple scale feature analysis on max pooling layers had been developed with the disparity map. The accuracy and the efficiency are not good in the existing system. As a future enhancement detection of the missing child with exact identification can be developed with better algorithms.

IV. PROPOSED SYSTEM

In proposed system, missing child person analysis is done. This system will be mainly focus on the machine learning and AI approach. First thing is where the missing person faces are trained in the training phase. This training system undergoes on the face feature mapping analysis. The system will made on the CCTV based video surveillance capturing will be the main easy identification. This video surveillance is captured with many image processing steps to find out the exact detection. The system undergoes multiple steps to match the child missing in the multiple public areas. Mainly an alert based system is added to make the face matching on public areas.

©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |

This alert will be a mail system where the police will get the image of the child when they are matched. After matching this analysis the police will make their proceedings to be done well. Hybrid Artificial Neural Network with back propagation algorithm added. This algorithm makes an analysis of multiple face detection in a single frame with template matching. On analyzing with pre-trained database back propagation functionality need to be done.

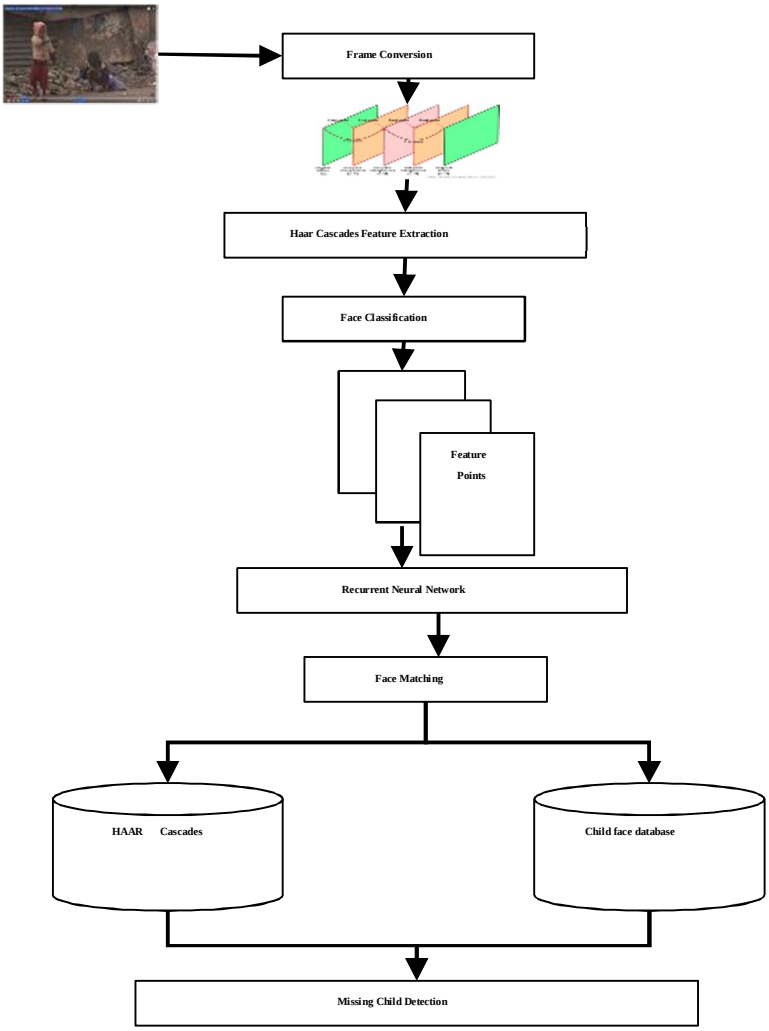


Fig 2 System architecture of the proposed system

V. METHODOLOGY

The proposed system undergoes the module of these research methods.

A. 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 missing child in public places. Here the multiple videos storage is get with the server side storage which is taken for the further analysis.

B. Key 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.

©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |

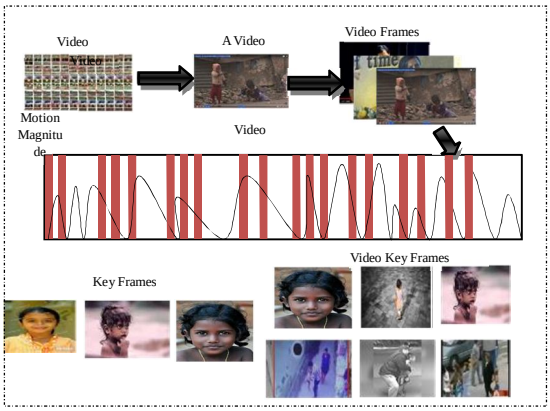


Fig 3 Key frame conversion from video

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.

C. 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.

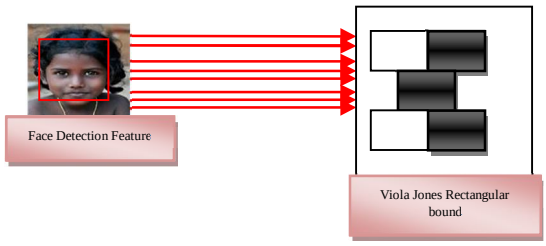


Fig 4 Haar Cascades Feature Extraction and plotting Points

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).

$$F(x,y) = \sum_{a=0}^{x}\sum_{b=0}^{y} I(a,b) \qquad (1)$$

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. R(x,y)= R(x,y-1)+I(x,y) (2)
F(x,y)= F(x-1,y)+R(x,y) (3)
The rectangular sum of region with rectangular shaped area calculates on each area with eye feature, nose feature, and eye brow feature extractor. Template matching with the fast convolution over feature matching is done with the training feature.

D. Face Classification

The classification with the classifiers of the extractor feature value points. The extracted features points on the HAAR cascades viola jones made a classification on the testing and the training phase. The training phase will get the extracted feature points and then be trained with the server database. The extracted and the trained feature will be added with the Recurrent Neural Network. After that the classification of the trained feature face set with multiple face analysis is done.

©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |

E. Recurrent Neural Network

In Recurrent Neural Network LSTM based facial classification is done to identify the facial features. The Long Short Term Memory (LSTM) is based on RNN with memory based identification. Here multiple memory blocks are identified with the neural blocks. Three layers are known with the neural network:

1) *Input Layer:* Input layer take the input feature pattern of the face which all gathered on the both testing and training phase.
2) *Hidden Layer:* The hidden layer will be placed on the trained features. Thus the face patterns are matched on each neuron layer. Multiple preceptor layers have been added with each feature pattern match.
3) *Output Layer:* The output layer will give out the matched feature of the thief feature change are identified. The face of the normal user or the child can be detection.

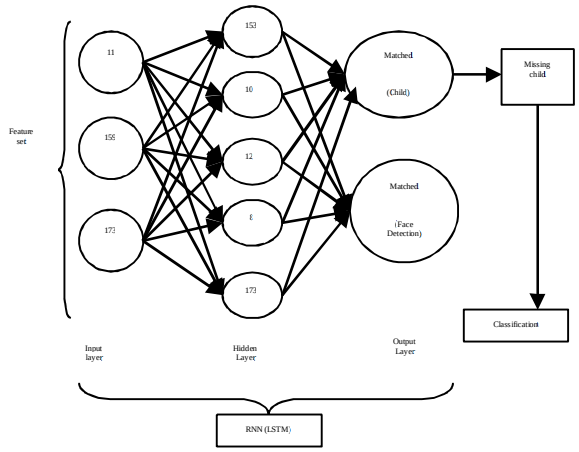


Fig 5 LSTM based RNN classification

The function approximation level is with the concentration RNN given on decomposition system. The LSTM variation will make an exact matching of the user level of faces detection. Each matching values are detected. Thus the face pattern are classified and detected with this field.

F. Email Alert

After the classification of the detected faces are done. The identification of missing child is shown with the email alert system. The person face will be captured as an image with key frame extraction and forwarded to the control room with the video surveillance area code.

VI. EXPERIMENTAL RESULT ANALYSIS

In the experimental results the multiple image dataset are been analyzed. Here the image are divided at two sub process one on the testing phase and the training phase. The testing and training image dataset are created with my classmates based analysis.

The HAAR cascades feature matching and the RNN classification tends to produce the good accuracy compared to the other existing solutions.

Each face matching pattern on the HAAR cascade feature analysis is detected with the total number of the features extracted with the system.



Fig 7 the database of the child face analysis

©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |

	Eye	Nose	Mouth	cheeks
Existing	17.21	11.32	11.00	8.2
Proposed	72.11	71.83	87.22	16.33

Table 1 the feature extraction pattern of existing and proposed system

This pattern differentiation will make a huge difference in the existing and the proposed solutions. Usually more than 17,896 feature pattern are trained in the default server to extract the correct pattern of the missing person identification.
The response time analysis of the each value prediction will be more different compared to the following solution. The prediction of the time response is mainly focused on the time taken for the existing and proposed solution response. The complete analysis is based on each matching pattern which tends to get the exact solution.



Fig 6 the feature value extraction of the existing and the proposed feature extraction

Thus the comparison chart on the accuracy of the existing and the proposed solution is based on the precision, Recall, F- measures and Final accuracy

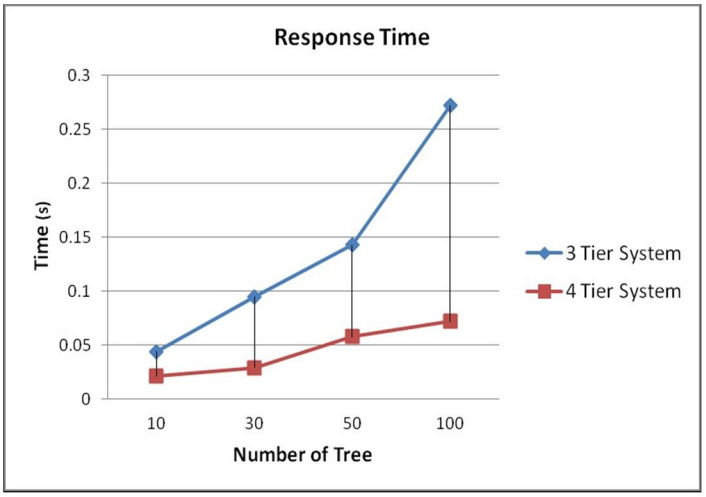


Fig 7 the graphical chart representation of the response time

.

The time taken with the proposed system algorithm execution system is comparatively low where the existing system is a tedious one which makes a prediction with a high rate of timing.

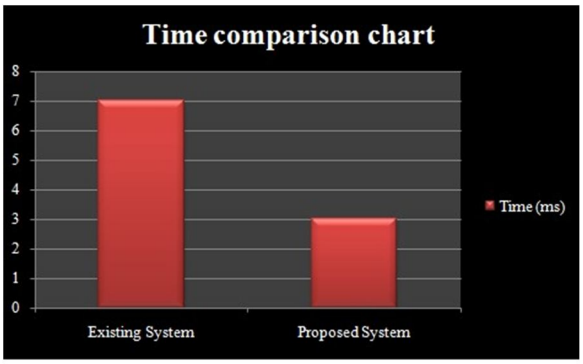


Fig 8 Time comparison chart

	Precisi on	Recall	F-Measure	Accuracy
CNN	74	26	66	78
RNN (LSTM)	86	14	89	97

Table 2 the accuracy graph measurement of the existing and proposed solution

The existing solution measures a low level identification compared with the proposed solution



Fig 9 Comparison chart of CNN and RNN

Thus the paper identifies the exact solution of detection over missing child detection with exact feature analysis.
Here a feedback and rating analysis of the face detection with the customer detection of the faces are getting captured with the generated approach system. The maintenance of the system tends out 100 featured faces with a existing and proposed system and check out for the detection of the thief analysis.

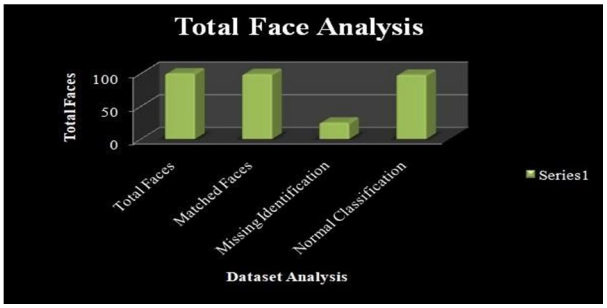


Fig 10 Chart analysis on tested and trained face

Thus the implementation with the result analysis shows out an efficient accessing and formulated pattern with the proposed algorithm and extractions

VII. CONCLUSION AND FUTURE ENHANCEMENT

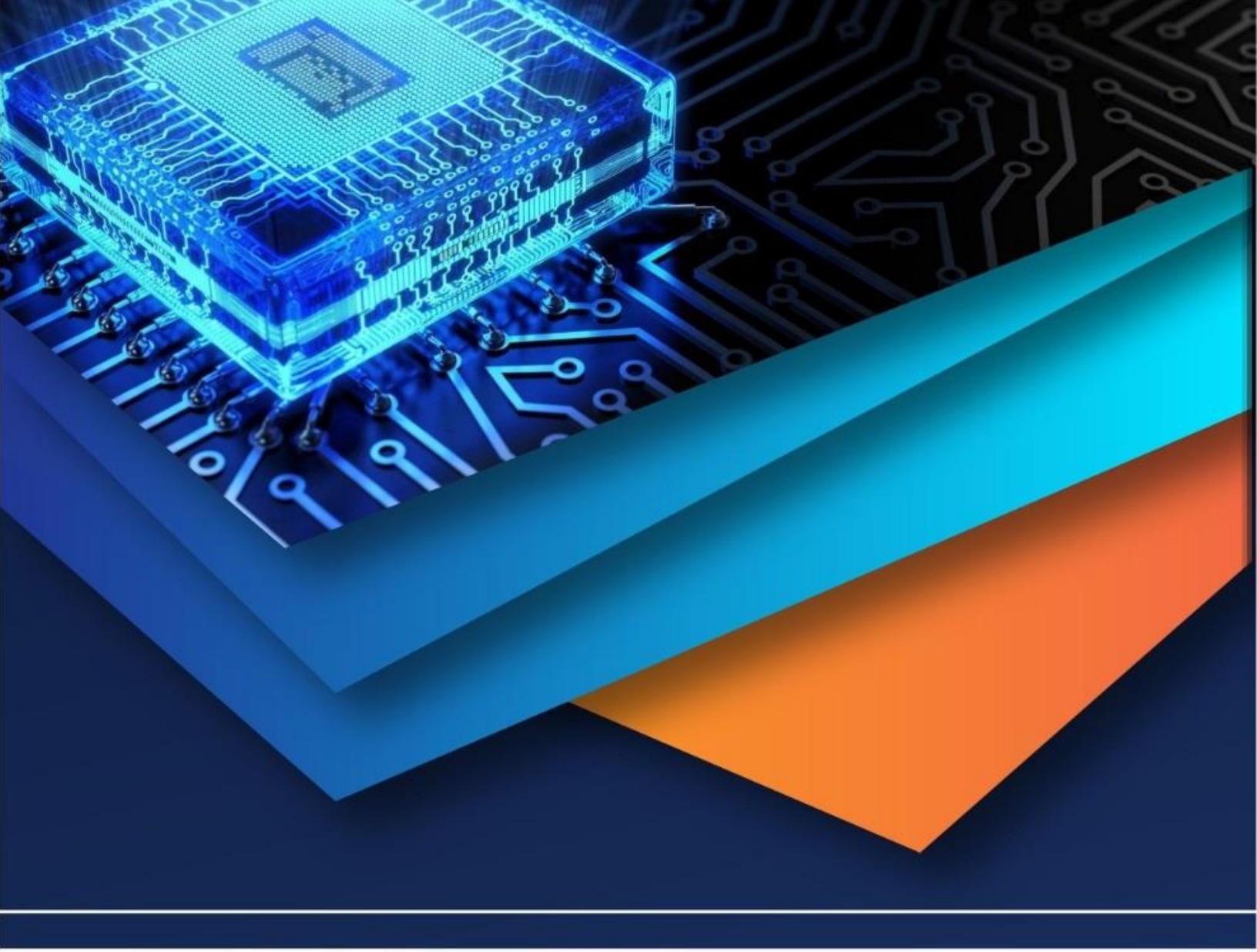
The identification of the missing child over 7crore member in public place is a tedious one. Face recognition and the matching pattern proposed in this paper give a good solution for the police or CBI side to identify the face using CCTV. The extraction of geometrical feature values meant to be the basic matching template detection. Further regularization of the Recurrent Neural Network (RNN) system will generates the multiple level of system. This generated method will benefit on the various application of detection of these missing child. The accuracy provides a good efficiency compared to all other existing systems.

In future enhancement the detection of the facial pattern can be given with 100% accuracy in further analysis. The person with metal will be analyzed and detected

REFERENCES

[1] Weiping Chen; Yongsheng Gao, "Face Recognition Using Ensemble String Matching", IEEE Transactions on Image Processing (Volume: 22, Issue: 12, Dec. 2013)
[2] Jun-Yong Zhu; Wei-Shi Zheng; JianHuang Lai; Stan Z. Li, "Matching NIR Face to VIS Face Using Transduction", IEEE Transactions on Information Forensics and Security (Volume: 9, Issue: 3, March 2014)
[3] Renliang Weng; Jiwen Lu; Yap-Peng Tan, "Robust Point Set Matching for Partial Face Recognition", IEEE Transactions on Image Processing (Volume: 25, Issue: 3, March 2016) [4] Himanshu S. Bhatt; Richa Singh; Mayank Vatsa; Nalini K. Ratha, "Improving Cross-Resolution Face Matching Using Ensemble-Based Co-Transfer Learning", IEEE Transactions on Image Processing (Volume: 23, Issue: 12, Dec. 2014)
[4] Jiwen Lu; Venice Erin Liong; Xiuzhuang Zhou; Jie Zhou, "Learning Compact Binary Face Descriptor for Face Recognition", IEEE Transactions on Pattern Analysis and Machine Intelligence (Volume: 37, Issue: 10, Oct. 1 2015)
[5] S. Satoh, " Comparative evaluation of face sequence matching for content-based video access", IEEE International Conference on Automatic Face and Gesture Recognition (Cat. No. PR00580), 2002
[6] Ahmad Zarkasi; Siti Nurmaini, "Face Movement Detection Using Template Matching", International Conference on Electrical Engineering and Computer Science (ICECOS), 2018
[7] Imasha Lakshan; Lumini Wickramasinghe, "Real Time Deception Detection for Criminal Investigation", National Information Technology Conference (NITC), 2019
[8] M Hanuma Teja, "Real-time live face detection using face template matching and DCT energy analysis", International Conference of Soft Computing and Pattern Recognition (SoCPaR), 2011
[9] Ubon Thongsatapornwatana; Woraphon Lilakiatsakun, " Analysis of criminal behaviors for suspect vehicle detection", Twelfth International Conference on Digital Information Management (ICDIM), 2017
[10] Liao, S., Jain, A. K., & Li, S. Z. A fast and accurate unconstrained face detector, IEEE transactions on pattern analysis and machine intelligence, 38(2), 211-223. (2015).
[11] Kohli, N., Yadav, D., & Noore, A.
[12] Multiple projective dictionary learning to detect plastic surgery for face verification, IEEE Access, 3, 2572-2580. (2015).
[13] Ranjan, R., Patel, V. M., & Chellappa, R. Hyperface: A deep multi-task learning framework for face detection, landmark localization, pose estimation, and gender recognition, IEEE Transactions on Pattern Analysis and Machine Intelligence, 41(1), 121135. (2017).

©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)