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Missing Child Identification System using Deep Learning & Multiclass SVM

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ABSTRACT

In India a countless number of children are reported missing every year. Among the missing child cases a large percentage of children remain untraced. This paper presents a novel use of deep learning methodology for identifying the reported missing child from the photos of multitude of children available, with the help of face recognition. The public can upload photographs of suspicious child into a common portal with landmarks and remarks. The photo will be automatically compared with the registered photos of the missing child from the repository. For this, a deep learning model is trained to correctly identify the missing child from the missing child image database provided,Classification of the input child image is performed and photo with best match will be selected from the database of missing children, using the facial image uploaded by the public.The Convolutional Neural Network (CNN), a highly effective deep learning technique for image based applications isadopted here for face recognition.

Face descriptors are extracted from the images using a pre-trained CNN model VGG-Face deep architecture.Compared with normal deep learning applications, our algorithm uses convolution network only as a high level feature extractor and the child recognition is done by the trained SVM classifier. Choosing the best performing CNN model for face recognition, VGG-Face and proper training of it results in a deep learning model invariant to noise, illumination, contrast, occlusion, image pose and age of the child and it outperforms earlier methods in face recognition based missing child identification.

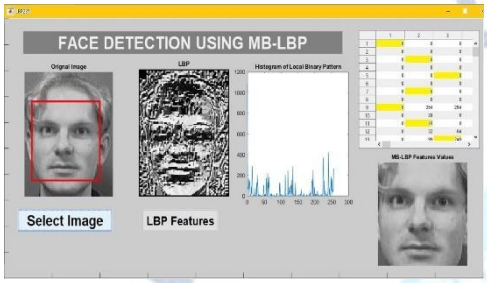
The classification performance achieved for child identification system is 99.41%. It was evaluated on 43 Child cases.

1. INTRODUCTION

Children are the greatest asset of each nation.The future of any country depends upon the right upbringing of its children. India is the second populous country in the world and children represent a significant percentage of total population.Children who go missing may be exploited and abused for various purposes.

EXISTING SYSTEM:

Earliest methods for face recognition commonly used computer vision features such as HOG (Histogram of Oriented Gradients), LBP(Local Binary Pattern), SIFT(Scale Invariant Feature Transform) or SURF(Speed-Up Robust Features). However, features extracted using a CNN network for getting facial representations gives better performance in face recognition than handcrafted features.

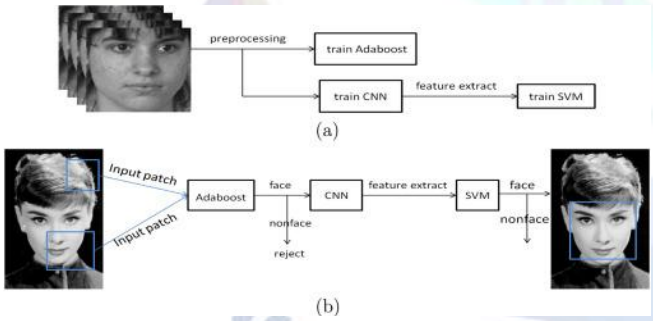


DISADVANTAGE:

Less Accuracy

PROPOSED SYSTEM:

Here we propose a methodology for missing child identification which combines facial feature extraction based on deep learning and matching based on support vector machine. The proposed system utilizes face recognition for missing child identification.



ADVANTAGE: This is to help authorities and parents in missing child investigation.

CONCLUSION:

A missing child identification system is proposed, which combines the powerful CNN based deep learning approach for feature extraction and support vector machine classifier for classification of different child categories.

This system is evaluated with the deep learning model which is trained with feature representations of children faces. By discarding the soft max of the VGG-Face model and extracting CNN image features to train a multi classSVM, it was possible to achieve superior performance.

SCOPE OF THE PROJECT:

Children are the greatest asset of each nation. The future of any country depends upon the right upbringing of its children. India is the second populous country in the world and children represent a significant percentage of total population. But unfortunately a large number of children go missing every year in India due to various reasons including abduction or kidnapping, run-away children, trafficked children and lost children. A deeply disturbing fact about India's missing children is that while on an average 174 children go missing every day, half of them remain untraced.

Children who go missing may be exploited and abused for various purposes. As per the National Crime Records Bureau (NCRB) report which was cited by the Ministry of Home Affairs (MHA) in the Parliament (LS Q no. 3928, 20-03- 2018), more than one lakh children (1,11,569 in actual numbers) were reported to have gone missing till 2016, and 55,625 of them remained untraced till the end of the year. Many NGOs claim that estimates of missing children are much higher than reported.

Conflict of interest statement

Authors declare that they do not have any conflict of interest.

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