

Missing Child Recognition System Using Deep Learning and Multi-Class Support Vector Machine

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Abstract— This paper tells a pair of novel use of deep learning methodology which is employed for identifying the reported missing children from the images of multiple youngsters available, with the assistance of face recognition. the ultimate public can upload their images of suspicious children into an everyday portal with landmarks and remarks. The photo are automatically compared with the registered photos of the missing child from the repository. Cataloging of the input child photo is performed and photo with best match are designated from the database of missing children. For this, a deep learning model is trained to properly identify the missing child from the missing child image database provided, using the facial image uploaded by the final word public. The Convolutional Neural Network (CNN), is incredibly effective deep learning technique for image based applications is adopted here for face recognition. Face descriptors are extracted from the images employing 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 thus the kid recognition is completed by the trained SVM classifier. Choosing the foremost effective performing CNN model for face recognition, VGG-Face and proper training of it finally ends up during a very deep learning model invariant to noise, contrast, image pose and also the age of the children and earlier methods in face recognition based missing child identification.

Indexed Terms-- Face recognition; Image processing ; Numpy; SVM ; CNN features ; Search photos ; Matplotlib

I. INTRODUCTION

The main purpose of this design is to spot Missing Child Identification System using Deep Learning and Multiclass SVM. In India a in numerous numbers of youngsters are reported missing when. Among the missing child cases an oversized chance of youngsters remains untraced. the general public can upload photos of suspicious child into a standard gate with milestones and reflections. The print are automatically compared with the registered prints of the missing child from the depository. The Convolutional Neural Network (CNN), a largely effective deep literacy fashion for image grounded operations is espoused then for face recognition. The bracket performance achieved for child identification system is99.41. it had been estimated on 43 Child cases. Children are the topmost asset of every nation. the longer term of any country depends upon the correct parenting of its children. India is that the alternate vibrant country within the world and youngsters represent a big chance of total population. But unfortunately, an outsized number of youngsters go missing when in India because of colorful reasons including hijacking, run-away children, traded children and lost children. the kids who missing could also be exploited and abused for colorful purposes. As per the National Crime Records Bureau (NCRB) report which was cited by the Ministry of Home Affairs (MHA) within the Parliament (LS Qno. 3928, 20-03-2018), further than one lakh children (in factual figures) were reported to possess gone missing till 2016, and of them remained untraced till the top of the time. Numerous NGOs claim that estimates of missing children are much advanced than reported. Mostly

missing child cases are reported to the police. the kid missing from one region could also be plant in another region or another state, for colorful reasons. So indeed, if a toddler is plant, it's delicate to spot him/ her from the reported missing cases. A frame and methodology for developing an assistive tool for tracing missing child is described during this paper. a concept for maintaining a virtual space is proposed, similar that the recent photos of kids given by parents at the time of reporting missing cases is saved in a very depository. the general public is given provision to freely take photos of kids in suspected situations and uploaded in this gate. Automatic searching of this print among the missing child case Page 2 images are going to *be handed* within the operation. This supports the law enforcement officials to detect the kid anywhere in India. When a baby is plant, the bite that point is matched against the pictures uploaded by the Police/ guardian at the time of missing. Occasionally the kid has been missing for an extended time. This age gap reflects within the images since growing affects the form of the face and texture of the skin. the purpose discriminator steady to growing goods must be deduced. this can be one among the challenges in missing child identification system compared to the opposite face recognition systems. Also, facial appearance of kid can vary thanks to changes in disguise, exposure, illumination, occlusions, noise in background etc. The photo which was taken by the general public might not be an good quality, so some is also captured from a distance without the knowledge of the childfren. A deep literacy (1) armature considering of these constrain is intended here. The proposed system is relatively a straightforward, affordable and dependable system compared to other biometrics like cutlet print and iris recognition systems.

II. LITERATURE SURVEY

- 2.1 Y. LeCun, Y. Bengio, and G. Hinton, "Deep knowledge", Nature, 521 (7553) 436 – 444, 2015.

Deep knowledge allows computational models that are composed of multiple processing layers to search out representations of knowledge with multiple situations of abstraction. These styles have dramatically bettered the state-of-the-art in speech recognition, visual beholding, object discovery and cornucopia of other

disciplines like drug discovery and genomics. Deep knowledge discovers intricate structure in large data sets by using the backpropagation algorithm to point how a machine should change its internal parameters that are accustomed cipher the representation in each caste from the representation within the former caste. Deep convolutional nets have led to advancements in processing images, video, speech and audio, whereas intermittent nets have shone light on successive data like text and speech.

- 2.2 O. Deniz, G. Bueno, J. Salido, and F.D. la Torre, "histograms of acquainted slants are used for Face recognition", Pattern Recognition Letters, 32 (12) 1598 – 1603, 2011.

Still-to- video face recognition (FR) plays a awfully important part in video surveillance, allowing to admit individualities of interest over a network of video cameras. Watch-list netting may possibly be a challenging video surveillance operation, because faces captured during enrollment (with still camera) may differ significantly from those captured during operations (with surveillance cameras) under hysterical internee conditions (with variations in, e.g., disguise, scale, illumination, occlusion, and blur). Also, the facial models used for identical are generally designed a priori with a limited number of reference stills. during this paper, a multi-classifier system is proposed that exploits sphere adaptation and multiple representations of face captures. A specific ensemble of exemplar-SVM (eSVM) classifiers is supposed to model the only real reference still of every target existent, where different arbitrary subspaces, patches, and face descriptors are employed to return up with a various pool of classifiers. to boost soundness of face-SVMs are trained using the limited number of labeled faces in reference stills from the enrollment sphere, and an cornucopia of unlabeled faces in estimation vids from the functional sphere. Given the force of 1 reference target still, a specialized distance- predicated criteria is proposed supported parcels of e-SVMs for dynamic selection of the foremost competent classifiers per inquiry face. The proposed approach has been associated to exposure systems for still-to-video FR on vids from the COX-S2V dataset. Results indicate that ensemble of e-SVMs designed using estimation vids for sphere adaptation and dynamic ensemble selection yields a high position of FR

delicacy and computational effectiveness. 2.3 C. Geng and X. Jiang, "Face identity using sift features", IEEE International Conference on Image Processing (ICIP), 2009. Scale Steady Point Transform (SIFT) has shown to be a strong fashion for general object recognition/discovery. during this paper, we propose two new ways Volume-SIFT (VSIFT) and Partial-Descriptor-SIFT (PDSIFT) for face recognition supported the first SIFT algorithm. We compare holistic approaches Fisherface (FLDA), the set approach (NLDA) and Eigenfeature Regularization and Birth (ERE) with point predicated approaches SIFT and PDSIFT. Trials on the ORL and AR databases show that the act of PDSIFT is significantly better than the original SIFT way. Also, PDSIFT are suitable to do analogous performance because the foremost successful holistic approach ERE and significantly outperforms FLDA and NLDA

III. EXISTING SYSTEM

The Existing system tells about the face recognition by the computer vision features like LPB, HOG etc., The features which was extracted using convolutional neural network (ConvNet) gives us better facial expressions in an face recognition when compared to other methods. Each and every face photo corresponds to a child and the child face recognition is considered as an photo category classification issue.

3.1 DISADVANTAGES OF EXISTING SYSTEM

The main disadvantages in missing child identification system in existing system, daily nearby 100+ children are missing some child are found and a few child aren't found. And there isn't any any system available to spot the facial expressions of kid in an different environment like noises, lightning conditions with different facial attitudes and with different children.

IV. PROPOSED SYSTEM

The proposed system for a missing child identification combined with both the facial feature extraction concepts using deep learning and matching concepts using support vector machine. This system utilizes face recognition for the missing child identification and therefore the system is incredibly easy, inexpensive and reliable method while compared to other biometrics systems like fingerprint recognition

systems. This method executed using features extracted employing a CNN network for getting facial representations which gives better in face recognition than other features.

ARCHITECTURE DIAGRAM

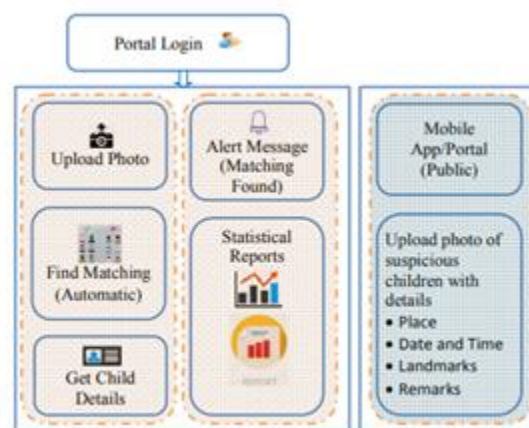


Fig. 1. Architecture of proposed child identification system

V. SYSTEM DESIGN

Programming configuration sits at the specialized portion of the product designing procedure and is applied paying little mind to the advancement worldview and zone of use. Arrangement is the initial phase in the progress stage for any planned item or framework. The's fashioner will likely deliver a model or portrayal of a substance that will later be assembled. Starting, when framework necessity have been indicated and dissected, framework configuration is the first of the three specialized exercises - plan, code and test that is required to construct and check programming.

VI. MODULES

- PREPROCESSING
- UPLOAD PHOTO
- SEARCH

6.1 Modules Description:

6.1.1. PREPROCESSING

Preprocessing input raw photo within the context of face identification involves acquiring the face region and standardizing images during a format compatible with the CNN architecture employed. Each CNN

incorporates a different input size requirement. the pictures of missing child acquired by a photographic camera or transportable are taken and categorized into separate cases for creating the database of face recognition system. The face region in each photo is recognized and cropped for getting the input face pictures.

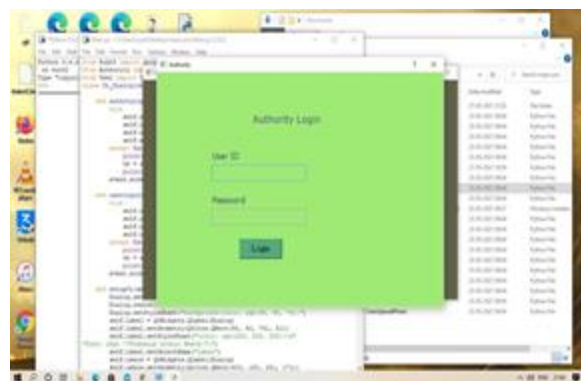
6.1.2 UPLOAD PHOTO

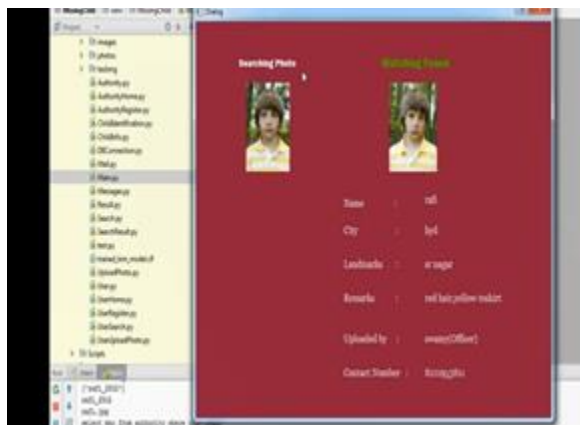
It consists of a public gate for storing details of missing child along with the print. Whenever a child missing is reported, along with the FIR, the worried officer uploads the print of the missing child into the gate. The public can upload print of any doubtful child at any time into the portal with details like place, time, milestones and reflections. The image uploaded by the druggies will be automatically related with prints of the registered missing children and if a matching print with satisfactory score is plant, also an alert announcement will be transferred to the concerned officer. The announcement will also be visible in the communication box of the concerned officer login screen.

6.1.3 SEARCH

Whenever druggies uploads print of a suspected child, the system generates template vector of the facial features from the uploaded photo . However, the system displays the most betrothed print and pushes a communication to the concerned Officer gate or Telegraph the alert communication of matching child, If a matching is plant in the depository. Also the Officer can check for any matching with the database at any time using the proposed system.

SCREEN SHOTS





VII. CONCLUSION

A missing child identification system is proposed, which combines the important CNN grounded deep learning approach for point birth and support vector machine classifier for bracket of different child orders. This system is estimated with the deep literacy model which is trained with point representations of children faces. By discarding the soft maximum of the VGG-Face model and rooting CNN image features to train a multi class SVM, it was possible to achieve superior performance. Performance of the proposed system is tested using the photos of children with different lighting conditions, noises and also images at different periods of children. The bracket achieved a advanced delicacy of 99.41 which shows that the proposed methodology of face recognition could be used for dependable missing children identification.

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