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MISSING CHILD IDENTIFICATION USING DEEP LEARNING

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***Abstract*— In the world, a countless number of people are missing every day which includes most of them are children's. Most of them remain untraced. This project proposes a system that would help the police and the public by accelerating the process of searching using face recognition. When a child goes missing, the police can upload the picture of the child by taking the latest picture of child from the parents when the case is registered and he get stores in the database. With the advent of the technology, especially cameras which are installed in many public and private areas to provide surveillance activities. The footage of the cameras can be used to recognize the pretrained missing child on scene. In this model, an automated facial recognition system for Missing Child database was proposed using known Haar feature-based cascade classifier. This system will be able to detect face and recognize face automatically in real time.**

Keywords—Missing Child; Open CV; Face Detection; Deep Learning;

I. INTRODUCTION

As we know that the India is a second largest country in the world if it comes to population. And there are many of children among us. As there is a great saying "TODAYS CHILDREN ARE TOMORROWS CITIZENS". So as a citizen of India it is our responsibility to save our children's from Kidnappings or Missing in crowd places like Kumbamelas and any religious or social gatherings etc. As per the survey on an average of 175 children's are Missing every day and Half of them were being Untraced. We generally find may children's begging on the road sides especially at the Traffic signals. None of us have a knowledge on them weather they were forcefully ordered to beg by the kidnaper. Because there are many situations we see a child who is missed in one state may found in another state. And also consider a case like a child is too young to speak or remember his/her address or not able to identify the parents. It takes more time to find that child if the case was like above mentioned one.

PROJECT OVERVIEW:

In our project, we have implemented a pretty simple and effective face detection algorithm which takes child face into account. Our aim, which we believe we've reached, was to develop a system which will be employed by police or investigation departments to acknowledge missing child from their faces. The method of face recognition used is fast, robust, reasonably simple and accurate with a comparatively simple and straightforward to know algorithms and technique. The automatically tagging feature adds a replacement dimension to sharing pictures among the people that are within the picture and also gives the thought to people about who the child is in the image.

EXISTING SYSTEM:

In India, police department is the largest unit for preventing crimes like kidnaps and maintaining law orders, rules and peace throughout the country. However, problem with the Indian police is that they are still using the traditional manual process to keep and analyze the records of Missing Childs. These the following methods they follow. Searching them in person throughout the city. This particularly takes a lot of time to find the child what if the case was the child is taken to another city. In that case there are less chances to find that child.

PROPOSED SYSTEM:

We have implemented a pretty simple Missing Child detection algorithm which takes child faces into account. Our goal is to develop a model which could be implemented by our police department to acknowledge the Missing Childs from the inputs faces. With the help of accessing the cctv footage we can actually acknowledge the Child. It is an Artificial Intelligence based project which uses Haar-Cascade Face classifier and LBPH face recognition.

II. TECHNOLOGY

What is Artificial Intelligence?

Artificial intelligence is an ability of the computer to perform tasks that are usually done by humans because it needs human intelligence. The benchmark for AI is human intelligence regarding reasoning, speech, and vision. This benchmark is far off in the future.AI has three different levels:**1**. Narrow AI: when the machine can perform a specific task better than a human is said as Narrow AI **2**. General AI: when machine can

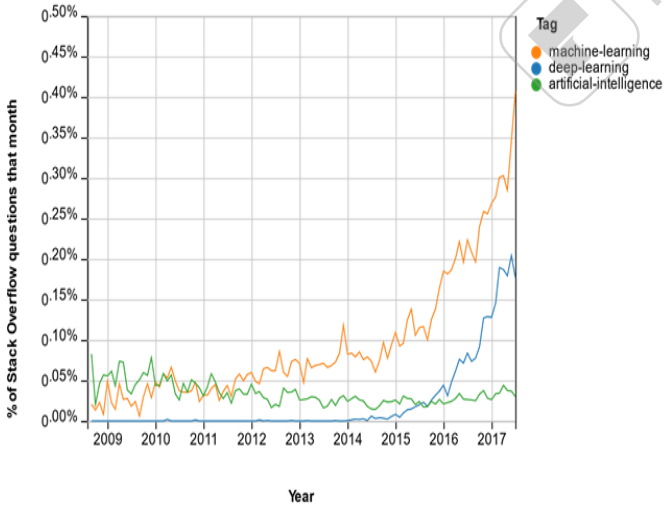
perform any intellectual task with the same accuracy level as a human is said as General AI **3**. Active AI: when machine can beat humans in many tasks is said as active AI.

What is Machine Learning?

Machine learning is the best tool thus far to research, understand and identify a pattern within the data. One of the most ideas behind machine learning is that the PCs are often trained to automate tasks that might be exhaustive or impossible for a person's being. The clear breach from the normal analysis is that machine learning can take decisions with minimal human intervention. Imagine you are meant to build a program that recognizes objects. To train the model, you will use a classifier. A classifier uses the features of an object to try identifying the class it belongs to. Machine learning uses data to feed an algorithm which will understand the connection between the input and therefore the output. When the machine finishes learning, it can predict the worth or the category of latest data.

What is Deep Learning?

Deep learning is computer software that mimics the network of neurons in a brain. It is a subset of machine learning and is named deep learning because it makes use of deep neural networks. The machine uses different layers to find out from the info. The depth of the model is represented by the number of layers in the model. Deep learning is the new state of the art in terms of AI. In deep learning, the training phase is completed through a neural network. A neural network is an architecture where the layers are stacked on top of every other.



III. IMPLEMENTATION

As proposed earlier, this recognition method uses image processing. A face detection algorithm is introduced to find out the missing children. The technologies we have used are Python, OpenCV, Matplotlib, Haarcascade classifier, LBP Algorithm.

A. **Python**

Python is our major programming language. It is used for creating our Neural Network model. It provides various tools and libraries that help in consistently creating our model.

B. **OpenCV**

OpenCV is another library of several programming functions that aims at real-time computer vision. We used this library to process images in real-time and access a camera and display the outcome to the person.

C. **Matplotlib**

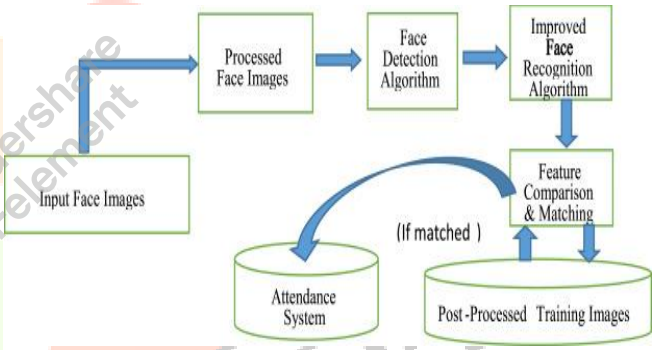
Matplotlib. **pyplot** is a collection of functions that make **matplotlib** work like MATLAB. Each **pyplot** function makes some change to a figure: e.g., creates a figure, creates a plotting area in a figure, plots some lines in a plotting area, decorates the plot with labels.

D**. Haarcascade classifier**

Haar Cascade is a machine learning object detection algorithm used to identify objects in an image or video and based on the concept of features proposed by Paul Viola and Michael Jones in their paper "Rapid Object Detection using a Boosted Cascade of Simple Features" in 2001.

E. **LBPH Algorithm**

Local Binary Pattern (LBP) is a simple yet very efficient texture operator which labels the pixels of an image by thresholding the neighbourhood of each pixel and considers the result as a binary number. It was first described in 1994 (LBP) and has since been found to be a powerful feature for texture classification.

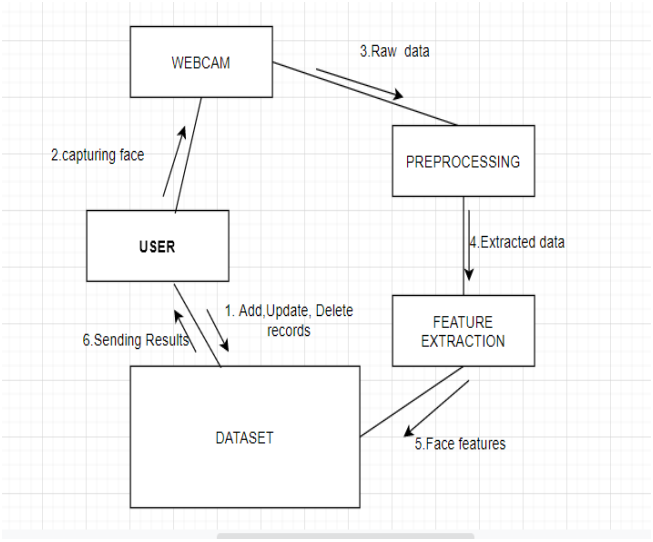


IV. WORKING MODEL

A. Generating a Dataset

The faces of specific child's can be captured by using this classifier and stored in the database with particular identity. More the number of captures will make the model more effective. This database can be used to train the model and to recognize the face in the final phase.

Our own dataset is created in this phase. Each required child is being captured and stored using the specific ID which is asked as input. Thus it will become easy to identify the details of the recognized child.



Workflow

Haar Cascade classifiers are an effective way for object detection. ... **Haar Cascade** is a machine learning-based approach where a lot of positive and negative images are used to train the **classifier**. Positive images – These images contain the images which we want our **classifier** to identify.

B. Training the images in dataset.

We use Local Binary Pattern Histogram for storing histogram values of each image. After the image capturing by webcam the image is applied on the face Recognizer, then it stores the histogram values of each image. The detailed explanation of the LBPH algorithm can be in the detection phase. The images with the given Id will be trained and shown with their Id's that they have successfully trained.

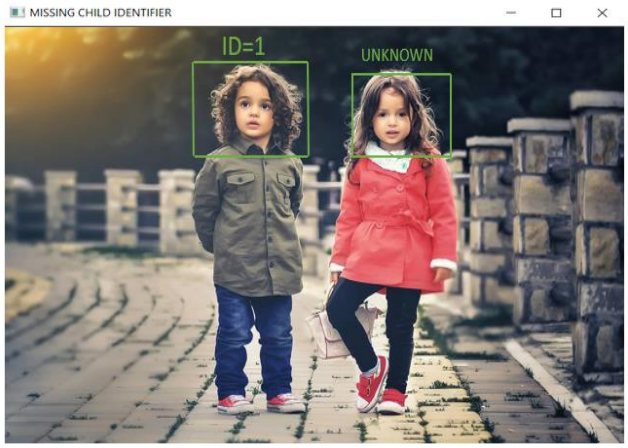
```
    clf = cv2.face.LBPHFaceRecognizer_create()
    clf.train(faces, ids)
    clf.write("C:/Users/bhara/Desktop/PROJECT/classifier.yml")
    print('trained successfully')


train_classifer("C:/Users/bhara/Desktop/PROJECT/Data")
```

```
1
1
1
2
3
4
trained successfully
```

C. Missing Child Recognition.

The ultimate task is to recognize the face. The Haar Cascade classifier and training recognizer is used for face recognition. The classifier will compare the input image with the stored images. If the input image is matched with the database images, then the result of recognition will be displayed on the camera screen and notifies us through the sound.



With the help of that ID=1 where ID value acts as a unique primary key to every child data. When the parents register the case about their child that he/her is missing then that time only the police person collects the complete information about the child and enter those it in a database and generates a ID.

D. Buzzer and Alert

As soon as the missing child found and shown on the screen that it recognized him/her and shows with his Id then the immediately sound or alert will play as the child found. So, this helps in acknowledging the found child much easier.

V. CONCLUSION

In this project, we are able to detect and recognize faces of the child's in an image and in a video stream obtained from a camera in real time. We have used Haar feature-based cascade classifiers in OpenCV approach for face detection. It is a machine learning based approach where a cascade function is trained from a lot of positive and negative images. It is then used to detect objects in other images. Also, we have used Local Binary Patterns Histograms(LBPH) for face recognition. This model can be able to recognize multiple faces in a single frame or video. For Example, if we want to identify a Missing Child who is passing through the area which is under surveillance, in this case if we trained the model with that child face, then model can identify that child within seconds. The model can be very helpful in various public areas to identify a required Missing Child.

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