

Criminal Face Recognition using Tensor Flow on Android App

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Abstract

As we know every day the crime rate is increasing day by day, some criminals are freely surviving because only they are not recognised. The civil police are not available everywhere in public to catch this type of criminal. As you know traffic police have a device that they find vehicle details only by giving the number from this idea we make this application. As we know, to identify a face is more difficult because everyday some changes happen in the face complex and our police has no any advance application utilizing that they can undoubtedly recognize criminal. The proposed system is developed for identify criminals in open place. Using application not only civil police as well traffic police also help to identify or caught criminals whose unreservedly survive. In this application we utilize tensorflow and google ML kit due to that the application is safer and optimized. Also we utilize neural network idea for profoundly and precisely recognise the face and give accurate outcome in second.

I. INTRODUCTION

The human face assumes a significant part in our social intercourse of person identity and remembering faces is remarkable. In the course of our life we can remember many faces and distinguish person even after long time you see person. As we can see that violation is expanding step by step and at an exceptionally high rate as one new crime is more than older. In other words we can express that one crime covers numerous as in our country there are endless violations and no records on the documents. This is actually a significant issue and we need to worry about the security issues. Crime counteractions and criminal recognizable pieces of proof are the essential perspectives because of that lawbreakers are moving around us. To monitor the criminal's record and use

them in a proficient way, we have developed the Android application which can recognize the criminal and show all connected criminal records like name, weight, Complexion, violations, and so on, which will assist police with distinguishing the criminal most precisely. Utilizing the captured image face identify framework identifies criminal faces more accurately. Which may help police to quickly distinguish proof related to criminals. This can prevent the assaults arranged by the worldwide most needed criminals. About the function information of the application, we use the tensorflow classifier framework. First they decide if there is a face in a given picture or not. It is the first step to recognition. This framework is fundamentally isolated into two sections online and offline for security reason. In online mode the face recognition process conclude only in which face detection, processing, extraction of features operation performed and get unique code of that recognised image then all database is store in offline mode in xml/json format on device so using that unique number we extract information about criminal like name, height, Complexion, crimes, etc.

II. LITERATURE SURVEY

[The previous framework shows some face space with higher dimensionality and it isn't compelling as well. The significant truth which is considered is that these face pictures have high dimensionality, actually in real they length extremely low dimensional space. In the current observation, the Android Application is a significant part of the daily lives of individuals. On the off chance that we add the feature like Face identify, it will assist in distinguishing individuals in a simpler manner. We have referenced some Research papers. In the Researches [1,2] it is described that the genuine execution of the calculations created on the Dlib and OpenCV Libraries. It likewise shows the

correlation between the different Face Recognition Algorithms created, in which the OpenCV library yet when it execute in portable they required more time to identify because of weighty library. In the Research [3] the paper proposes the android application for the Age, Gender and Face identify with the help of OpenCV Libraries. A LBP face highlights Library classifier was utilized for the face identification and LBPH model was utilized for face identification. In Research [4,7] the Face Recognition framework was produced for the Criminal Face identification Also, on another paper the Face identify model was created on the Raspberry Pi. [5,6] the specialist proposed the Face Recognition framework created on the CCTV cameras, utilizing Machine Learning model. from this research we conclude that all facial recognition framework are made getting work at of PC equipment because all these application required medium or above medium framework which is higher than android device. However, the utilization of Face Recognition Model straight we have utilized application with Google APIs which reduce processing time on android device, application works quicker and can be utilized processor time and give accurate prediction.

III. PROPOSED METHODOLOGY

This proposed system is based on an android application using some api. this system is capable to identify face and show result in less amount of time. In this application multiple operations are defined like select image, scan and then show data. if the record is not present then also show some message.

Work flow:

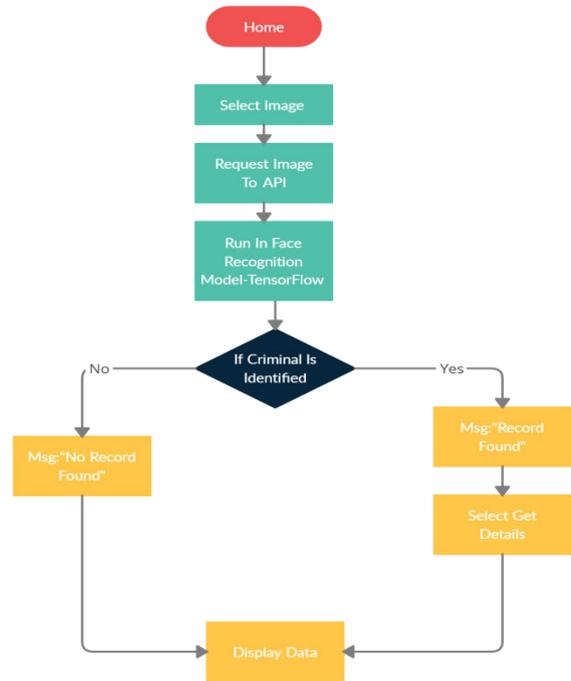


Fig 1: Work flow Diagram

Criminal Face Identification : To perform facial recognition, Modules need a tensorflow content made by google teachable machine. Image module from Google teachable machine is utilized to peruse the picture in grayscale design. Numpy is utilized to store the pictures. the client will catch the picture of Face, at that point he can transfer the picture (implies he is sending the solicitation to the API). The API demands the Image to the model. To Load the face identification, the initial step is to distinguish the face in each picture and return face value. using Face Value we discover information from records.

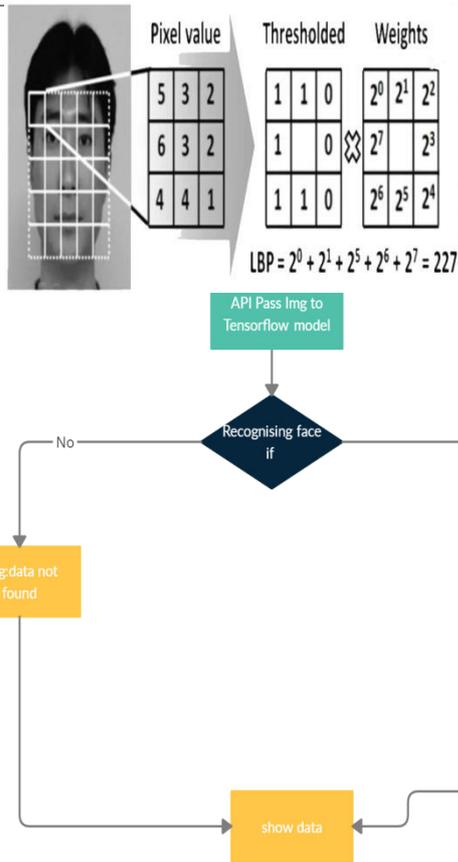


Fig 2: Working Diagram

Background working: The user of the application will pass the picture to API, at the API they discover face or utilizing haar cascade (XML). You realize that computerized pictures have assortment of pixels whose range change from 0-255 (RGB) so this range of pixels make grid also called matrix upon size of picture (in application we set 224*224). Using haar course they make negative and positive pictures. As indicated by that picture they perform estimations in precious diamond format (eyes-eyes-nose-lips) and return the presumptive range matrix. From that tensorflow model return the root value which is available at the focal point of the matrix ($L > V > R$). Using this range API discover the list range of picture exhibit in which picture match with API picture value, API get list value at which picture match. Using record value API discover information and identified with image fundamental data like name, type of criminal, and status (Active/Inactive) is appeared.

Fig 3: LBP working Diagram

We have used the LBPH recognizer because Real life face isn't the same as digital. We simply can't give guarantee that the digital image and its algorithmic feature in your images or 10 different images of a person are the same. LBPH focuses on extracting local features from images. The idea is to not look at the whole image as a high-dimensional vector but describe only local features of an object. The basic idea of Local Binary Patterns is to summarize the local structure in an image by comparing a pixel with its neighbourhood.

Formula of LBP: Local Binary Pattern. When we train a model with an available data set at that time we need to find the best alpha and beta value to fit and give high accuracy.

$$g(x, y) = \alpha * f(x, y) + \beta$$

This formula gives alpha (1.8) and beta (0.2). As we mention above sometimes images intensity is high so that time we need to decrease light intensity for accurate analysis there two more filter but we take median filter and bilateral filter and after testing we see bilateral filter gives best result formula is

$$F(x, y) = \frac{\sum_{x=-N}^N \sum_{y=-N}^N I(x, y) W(x, y)}{\sum_{x=-N}^N \sum_{y=-N}^N W(x, y)}$$

In this formula I function is for input image pixel value and W function for weighting also the denominator. After combine these two equations we get accurate prediction and reduced noise light intensity.

$$CF(x, y) = g(x, y) * F(x, y)$$

When all this equation improves the pixel complex then all these values are passed in LBP formula for final prediction of LBP value. So in this formula YX_c show the gray value or level p is intensity value with radius r and S function defined/value dimensionality of image.

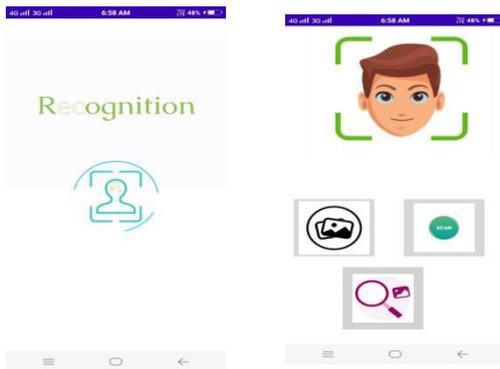
$$LBP_{p, r}(X_c, Y_c) = \sum_{p=0}^{p-1} 2^p S(i_p - i_c)$$

Components: following components we used for the proposed system.

Android studio: Android Studio is an IDE that we can create any android application with the help of java

programming . This study provides some features and environments that we can add some extra functionality into applications like machine learning, graphics animation etc.using some studio components like button, imagebox,and text view we develop this application.

Google Teachable machine: it is a platform of machine learning using which we can create machine learning project , applications. so we also use this for image recognition basically this also supports image



classification and recognition so using that functionality we implement it in application. Here we need to pass an image to the machine. They automatically extract features for recognition and give tensorflow lite models for future development.

III IMPLEMENTATION

The following steps are concerned within the implementation of the proposed system:

Step 1: Element Setup: create tensorflow model and train using google teachable machine according to image.

Step 2: Design:First we design the application layout in android studio for user interaction and add all component required for face recognition like button,imageview,textview;

Step3:Import ML kit in studio and create an environment to fit into android application by using java programming and connect with android for accepting images.

Step4: Operation: 1.At the time of model training we create a fixed size image set then train model so when we pass image to model we need to resize image.

2. After resizing the image ml model accepts and extracts the feature for image recognition. and after recognizing they give a unique number using that we can extract details from the database.

IV. RESULTS

We have to capture an image and upload a request to the API, if the Criminal is identified it will give the LBPvalue of the image. According to the value, the name is searched in the records and the basic information like name, type of criminal, and status (Active / Inactive) is shown.For the smooth working of this application and to improve its efficiency we would be taking the database from the server of the cops.the app will show it so that all the police man become aware of it.

V. CONCLUSION:

As there are other conventional methods of criminal identification, mobile application is a new field, it has a huge impact on ease of work and is still under research. Mobile application for criminal identification has faced a variety of challenges to the fact that mobile devices have unique features like , limited range of bandwidth, unreliable networks and many more. So under consideration of this feature we made a Proposed application that will help policemen to identify criminals if they freely survive around us. This application is based on google ml kit tensorflow classifier. It gives the best time and memory optimization because the recognition speed is fast and accuracy is also high. Also, we consider security issues so all essential data is stored in offline mode only. using quick number data are displayed.

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