DEVELOP AN ANDROID APPLICATION FOR SENIOR CITIZEN PENSIONERS TO GENERATE DIGITAL LIFE CERTIFICATE (JEEVAN PRAMANA) USING FACE RECOGNITION TECHNIQUES

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Keywords

EPF, IOS, Android, Face Recognition, Database, Machine learning, CMake, Dlib, PyCharm, Android studios.

Introduction

The Employees Provident Fund Organization is the lawful organization responsible for regulating and managing provident funds in India under the Ministry of Labour and Employment of the Government of India. The EPFO is in charge of managing the mandatory provident fund. Our work plays a significant role in verifying employees/people who are found eligible for PF by using Facial Recognition to avail their provident fund by sitting in the comfort of their homes. Humans require visual perception to function. The image observed by the system is processed via image recognition Analyzing the digital data recording allows multiple decisions to be made by classifying the observed things. Face Recognition requires the installation of two extra libraries, dlib and Face Recognition, in addition to Python and OpenCV. The OpenCV computer vision library, which allows model execution for Machine Learning (ML), was created to provide a standard framework for Machine Learning algorithms and computer vision. It features thousands of upgraded algorithms that may be utilized for a variety of tasks, including face detection and recognition, object identification, and more. In this project, we will snap images with our Mobile application and collect various encodings to recognize the live Face using the camera. For a human face, it might be the width, the distance between the corners of the lips, or the distance between the pupils. A "Measured" appearance can be determined in space, allowing us to identify a certain individual and distinguish him from others, even if they are quite similar.

Objective

During the COVID-19 pandemic, it was difficult for old aged people to move out or go somewhere to do their daily work. To avail the Employee provident fund after retirement, the old

senior person needs to undergo a verification process for which he needs to visit the Govt. office. To eliminate this problem, we came up with an idea to develop an Android Application for Senior Citizen Pensioners to generate Digital Life Certificate using Face Recognition techniques.

The main objective of this project is to develop a mobile application interface built for to visit android and IOS compatible devices, that provides a facility for senior citizens pensioners who cannot submit their fingerprint as biometric ID, to identify pensioner using face recognition technique and to generate a life certificate for the pensioner.

Methodology
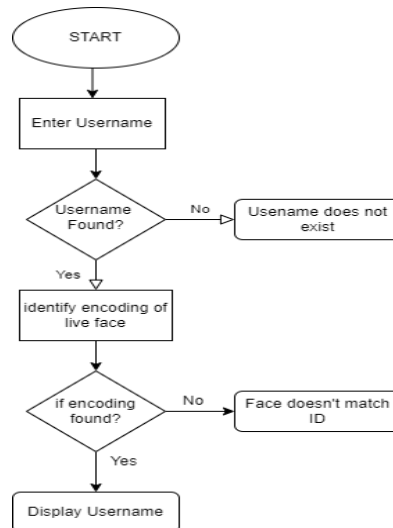
(a) A mobile application interface built for android and IOS compatible devices asks users to enter their unique identification number.

(b) The database consists of unique identification numbers of registered users applicable for EPF. The app's backend then checks for matching identification numbers with the registered IDs. If the user id exists, the application opens the device's camera for Facial Recognition.

(c) The live camera detects the Face of the applicant and finds encodings for the live Face.

(d) These encodings are compared with the trained images of registered users in the backend machine learning code.

(e) The encodings are compared based on 120 facial parameters of the Face.

(f) Once the image is compared and found in the database, the app displays that the Face is verified by displaying its unique identification number on the live Face.

Results and Conclusion

The Visual part of the app is designed and coded using software such as PyCharm, Android studio, and libraries using Kivy, Kivy Garden camera. The available templates of android studios can be selected and modified by adding the forementioned libraries. The visual of

an application is designed by adding Icons, colors, Borders, Margins. Fonts to have the application have to work opening it. The buttons, line spacing, and color combination make the application opulent with android studios which makes the visual representation of an application.
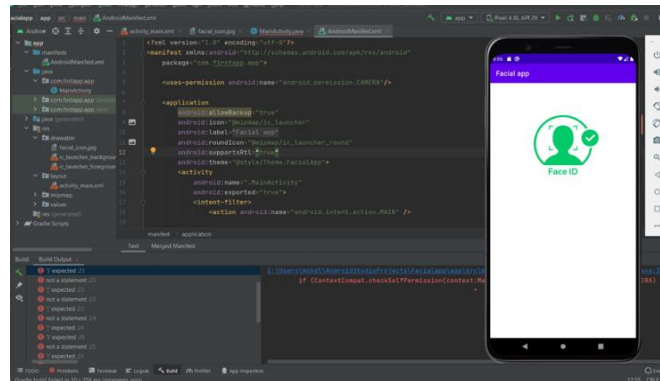

Fig 1: User Interface for Mobile application

The functional part of an app is developed using a machine learning algorithm (CVV) for Facial Recognition. We use python as our primary language in developing functional parts on applications and specific libraries supporting it, such as CMake, Dilib, OpenCV, and OpenCV python. These libraries support python. PyCharm environment provides an essential and integrated environment for productive application development, making it easier for developers and using these libraries and an integrated environment with multiple testing to provide a user-friendly experience.
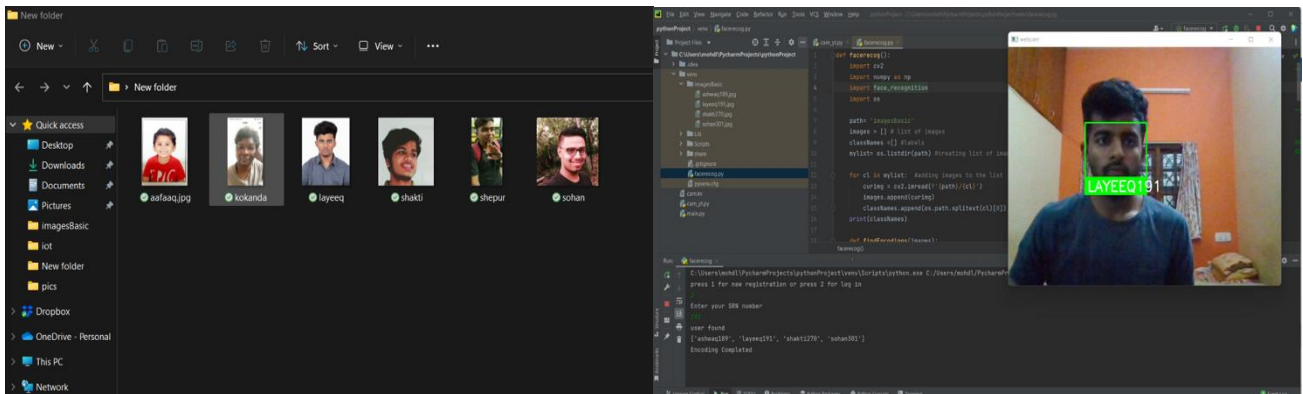

Fig 2: Trained data set (Machine Learning) & Fig 3: Facial Recognition with Python and OpenCV

Future Work

The visual and functional parts need to be combined and integrated, to yield a quality user-friendly application. This work is under progress. Scope is there to modified based on user feedback.