ASSITANCE FOR BLIND USING ARTIFICIAL INTELIGENCE

A PROJECT REPORT

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BONAFIDE CERTIFICATE

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ABSTRACT

In today's advanced hi-tech world, the need of independent living is recognized in case of visually impaired people who are facing main problem of social restrictiveness. They suffer in strange surroundings without any manual aid. Visual information is the basis for most tasks, so visually impaired people are at disadvantage because necessary information about the surrounding environment is not available. The need for developing a low-cost assistive system for the visually impaired and blind people has increased with steady increase in their population worldwide. With the recent advances in inclusive technology, it is possible to extend the support given to people with visual impairment. This project is proposed to help those people who are blind or visually impaired using Convolutional Neural Networks, Eigenfaces, Fisherfaces and Local Binary Patterns Histograms. The idea is implemented that focuses on voice assistant, image recognition, face recognition, voice output, etc. It is capable to assist using voice command to recognize peoples in the surrounding, do face analysis to recognize the faces collected as a whole data set. It will be an efficient way in which blind people can also interact with the environment with the help of technology and utilize the facilities of the technology. Also, our lives can be made more secure by course of used Technologies in the areas like national security.

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CHAPTER 1
INTRODUCTION

Artificial intelligence is the study and creation of computer systems that can perceive, reason and act. The goal is to develop an intelligent machine. The intelligence must be represented by learning, thinking, making decision, solving problems. AI is a collaborative field which requires knowledge in all fields such as psychology, computer science, engineering, logic, mathematics, ethics and so on. It is a new field which is expanding meteorically. AI can store large amounts of information and can process at high speed. It is a representation or duplication of human intelligence; AI systems are supposed to learn from the previous experience and self-correct through deep learning. As there is an increase in the growth of technology, these intelligent systems are also useful for the humans in the everyday life. It can be our companion, do our daily task, understand our emotions and help accordingly. The vision impaired individual finds it difficult to identify the peoples in the well-known environment and even simply walking down the crowded street. Many blind individuals rely on their dogs to get around from place to place since the dogs have the ability to sense danger to act accordingly and guide them too, unfortunately the dog itself gets attacked brutally. Humans mostly communicate through non-verbal activities such as facial expressions, gestures, body language and tone of voice, to communicate their emotions. Likewise, there are hundreds of thousands of emotions. To collect all these emotions, we use system local storage as normal storage device with all these data to be backed up. And when the machines find something new it needs to store that data too. Emotional intelligence (EI) is the area of cognitive ability that facilitates interpersonal behavior. Emotional quotient (EQ) and Emotional Intelligence Quotient(EIQ)[1], is the capability of individuals to recognize their own emotions and those of others, discern between different feelings and label them appropriately,

use emotional information to guide thinking and behavior, and manage and/or adjust emotions to adapt to environments or achieve one's goal. Studies have shown that people with high EI have greater mental health, job performance, and leadership skills although no causal relationships have been shown and such findings are likely to be attributable to general intelligence and specific personality traits rather than emotional intelligence as a construct.

1.1 SYSTEM MODULE

The detailed information about the system is given below and is represented in fig1.1

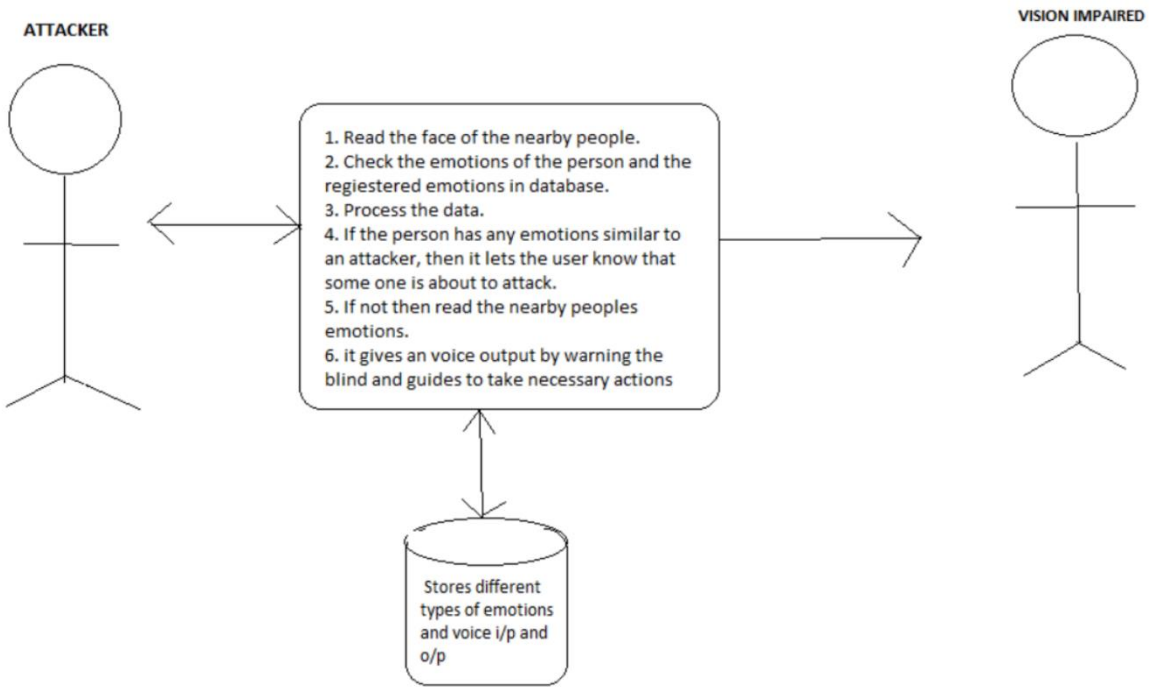


Fig 1.1 System Information

The device reads all the features of the face and the body nearby. If the recognized persons feature of both the face and body are similar to the registered features of an attacker, then the nearby person is the known person, if not, then the person is a stranger. When the system has detected that the nearby person is a known one, it

warns the user saying with the name of the detected person and gives the necessary instructions to avoid the chaos. If the person has chosen to go away from the spot then the system will guide the user and recognize the person and tell the user with necessary details. The machine reads the body language and facial expression using the camera. A test can be conducted by monitoring few expressions of the people throughout the day and the data can be imparted in the machine and if there are any new face or body language then the machine can take in the data and learn.

1.2 RECOMMENDER ENGINE

The primary purpose of this recommender engine is to discover the influence of visually challenged. The module is a computer- assisted program which provides them with a reincarnation. The targeted population for this study is visually challenged, eager to join various fields like the surrounding people. A sample of this accessible population was drawn through random sampling procedures. Provision of assistance services is one of the main factors furnishing the life of those people. Main feature of this project is to give them the best guide through AI and matches his attitude and attribute. Problems arise with the affected social development as children are not able to pick up on non-verbal clues or if they are unable to make eye contact, they may appear disinterested and can reduce sustained social interactions. Normally this activity is provided by counsellors or advisors who have lots of experience in the organization. But with growing number of impaired persons, and the amount of work on these people who are not able to handle the situation, the faculty of blind orphanage does not have sufficient knowledge and experience to handle them. They also do not have time to counsel them due to workload. Hence it is desirable to have some form of intelligent recommendation tools that needed to be developed to help them in the process of living.

CHAPTER 2

LITERATURE SURVEY

Woojin Chung, "Integrated navigation system for indoor service robots in large-scale environments" It contains architecture of navigation system, the development of crucial navigation algorithms like map, path planning, and localization, and planning scheme such as fault handling. This system provides some advantages that are 1) A range sensor based generalized scheme of navigation without modification of the environment. 2) Intelligent navigation-related components. 3) Framework supporting the selection of multiple behaviors and fault handling schemes [5].

Denis Tudor, Lidia Dobrescu, Drago Dobrescu, "Ultrasonic Electronic System for Blind People Navigation" This system presents a new electronic system using an ATmega328P microcontroller, two ultrasonic sensors and vibrating motors as a helping solution for blind people navigation. In order to determine the distance, HC-SR04 ultrasonic sensors are used. The HC-SR04 ultrasonic sensor uses sonar A short ultrasonic pulse is transmitted at the initial time, echoed by an object [5].

Kanchan M. Varpe, M.P. Wankhade," Visually Impaired Assistive System" which focuses on independent portability of blind people who travel in an unfamiliar environment without any manual assistance. System include on the server side ZigBee transceiver for wireless conversation, RFID reader with an integrated microcontroller, ZigBee transmitter and TTS for playing information to user. The VIAS can be used by visually impaired or blind users at the system implemented environment such as organization campus which can be school, college, hospitals, shopping mart, bus stands, etc. [4].

A. Aladrén, G. López-Nicolás, Luis Puig, and Josechu J. Guerrero" Navigation Assistance for the Visually Impaired Using RGB-D Sensor with Range Expansion", In this paper, a new system for NAVI is presented based on visual and range information. Rather of using multiple sensors, we choose one device, a consumer RGB-D camera, and take advantage of both range and visual information. In appropriate, the combination of depth information with image intensities, resulting in the robust expansion of the range-based floor segmentation. Our system detects the main structural elements of the scene using range data [2].

B.S. Tjan, P.J. Beckmann, R. Roy, N. Giudice4, and G.E. Legge, "Digital Sign System for Indoor Wayfinding for the Visually Impaired", In this we describe the design and implementation of a digital sign system based on low-cost passive retro-reflective tags printed with specially designed patterns that can be readily recognized and identified by a handheld camera and machine-vision system. Performance of the prototype showed the tag recognition system could cope with the real-world environment of a typical building [3]. In this survey, we observe that main problem of blind people should depend on any other guide like blind cane, black glasses, people information, trained dogs. But trained dog would also be burden of them as they can move only to the places that dog is trained.

2.1 Design and Implementation of Eye Stick for Blind People:

The paper has made a example which will discover objects or obstacles ahead of users and feeds warning back, within the types of voice. It permits blind folks to recognize any obstacles and it permits period of time feedback to the user with voice on speaker, mistreatment the supersonic Ranger, the obstacle at intervals four hundred cm aloof from the cane is detected. There three famous sensors used for obstacle detection.

They’re infrared device, supersonic device and optical maser device. Since optical maser device was costly it absolutely was neglected from the beginning of the project. The opposite two device outputs similar result however infrared sensors area unit notable to be disturbed by daylight and dark objects. Since the device is needed to discover obstacles at intervals person size the supersonic device was chosen. The unit will be used as associate independent navigation tool while not the necessity of the cane. This may also ensure that the user will use the cane while not the unit for places that area unit acquainted to them. The limitation of this design is that the device detects obstacle at narrow range.

2.2 A Rfid Application for the Disabled: Path Finder:

After the tests, it's clearly seen that blind people, who are not accustomed to the field, reached the target simply and correctly. Also, check users of the system turned back to the main gate from that they entered the field, successfully. Unfortunately, just in case of quite one target chosen, expected success result couldn't be achieved within the system, which can be seen from the graphs on top of. Besides, it is observed that passive RFID tags may be scan simply during a distance of thirty cm. to the reader, however whenever the tag holder is much away than 35 cm. to the reader, tags weren't read any further. So as to beat this drawback, either emission of the reader can be inflated or active RFID tags can be utilized in the system.

2.3 Voice Assisted Navigation System for the Blind:

This work presents a model of a navigation system that helps the visually impaired to maneuver in each indoor and outdoor environment. This method is intended to be completely self-sustainable and bank as very little as doable on virtual mapping ways. It’s hopped-up by AN on-board power source and permits the user to sense objects in their environment. Obstacle is perceived from supersonic sensing element and an

audio is played looking on the space of travel of ultrasound. An obstacle as shut as 4cm are often detected by the module. With a resolution of 15cm of obstacle distance, an acceptable audio instruction is given to the blind user. The navigator satisfactorily plays an applicable audio into the headphones which corresponds to the space of obstacle from the user. Change within the ground gradients has been tackled simply as the sensors method the sharp modification in ground level and intimates the user concerning constant. This planned system will be factory-made because the system is cheap. The system is implemented on the cane to produce a safer feeling to the blind. The project is often makeshift by the utilization of wireless LAN connections that supports the use of GPS. This helps the user to navigate a lot of accurately and effectively as a GPS module will actuate the position use of GPS co-ordinates.

2.4 A Real-time Localization System Using RFID for Visually Impaired:

This analysis given tag style and sensible white cane for ease in reading data while not additional devices. Short analysis is completed per the context of use that considers main user, task and environmental characteristics of matters during which it'll be operated. The example is simple to be told, use, and get or be subsidized from public service; therefore, we all over the acceptableness, usability, and price profit are satisfied. Also, huge decision opportunities and visibility for the blind in operating are given. Future work is going to be network environment and compatibility with infrastructure and current customary. Extending network environment to system will alter range to be not solely high-value applications of walking choices, however additionally following risk things that imply help through the network. to boot, road or building condition changes can be simply updated by the server. Compatibility with existing infrastructure and current customary like EPC global tag theme are required for smooth application.

2.5 Design and implementation of electronic aid to blind's cane:

ETAs, just like the sensible cane provide blind individuals an independency level that is simply potential by the employment if this device. The sensible cane offers a security zone between them and also the possible obstacles. One of the most effective characteristics is that the ability of the design to any quite cane therefore a blind man wouldn't want to change the cane to use the device. With this technological equipment, blind people are more assured once occupancy the streets and those they don't have to be compelled to modification their cane by another tool or technique as a result of this proposal is adaptable to the one, they have already got.

2.6 Smart Cane with Range notification for blind people:

The system uses of an ultrasonic sensor for getting input and use earphone as the output. Ultrasonic sensor is used to measure distance from the obstacle present in their path. The information is then fed to the NI myRIO-1900 which is after translated into the audio output. The beeping frequency increases as the user goes closer to the obstacle. The placement and orientation of the sensor on the cane was also well examined in terms of accuracy. The upper position sensor with angle of 90 degree has been found to the most real organization.

2.7 Electronic long cane for locomotion improving on visual impaired people, A case study.

In this work, a novel electronic cane, called ELC, was registered and calculated. This approach involved an ergonomic design along with an embedded electronics inside the grip of a traditional long cane which circulate human dimensional and tactile approach. The device indicates obstacles above waistline and warns about potential crash. Qualitative assessment of an ELC prototype was carried out by voluntary blind people. The obtained results showed the ELC effectiveness for detecting physical

barriers located above of the imaginary waistline, so, contributing to a better perception of the surrounding space by blind people or visually impaired people. The electronic circuit embedded on the grip can detect obstacles above the waistline in order to give a tactile feedback, through a vibration inside the cane. This tactile reply becomes more frequent meanwhile the user reaches the obstacle. The integrated hardware-ergonomic solution, in spite of simplicity, gives a new concept to improve flexibility, by indicating the related surrounding features above the user waist, thus, sharing to a safer human progression.

2.8 Novel indoor navigation system for Visually Impaired and blind people:

It provides the blind people the ability to travel without any other assistance. The planned system architecture uses a network of IP cameras placed at the roof of each room. A remote processing system investigate-by computer vision algorithms-photos taken from the environment in order to inform the subject about his location and reacts accordingly to pass the sufficient assistance and then use for bind people. A guidance algorithm used for destination using a simple interactive mobile application installed on his smart phone. The proof of concept prototype was designed with one camera on top of a wooden floor model to resemble the system. The proposed system access has a straightforward architecture. There are two principal actors in this architecture are the blind person and the remote processing system.

2.9 A 2d vibration array as an assistive device for visually impaired:

The 2D vibration array consists of 4x4 miniature vibrators attached to a portable computer, which is the main computing component of the whole wearable navigation system, called Tyflos. Tyflos consists of two miniature cameras which are attached to a two dark glasses, a microphone, an ear speaker, the 2D vibration array, and a portable computer. The cameras click images from the environment and later

convenient processing 3D representations are created. These 3D space representations are projected on the 2D array, which vibrates in various levels corresponding to the distances of the surrounding obstacles. The 2D array is attached to the blind user's chest in order to provide the convenient vibrations of the distances from the surroundings environment. The 2D vibration array is a dominant part of the Tyflos navigation system for visual impaired and blind people. The designing of the array, its reproduction and its first 4x4 implementation were also provided.

2.10 A tool for range sensing and environment discovery for the blind:

As the blind user strokes the hand-held system around, then blind user or visually impaired people will gain regional range information. In inclusion, the time profile of the range will be investigated by the onboard processor to detect environmental features that are demanding for flexibility, such as curbs, steps and drop-offs. In this implementation, range is collected by a short-baseline triangulation system that is formed by a point laser and a miniaturized camera, producing readings at frame rate. An Extended Kalman filter is used to record the range data and also recognize environmental features of interest. Prototype sensor will be part of a hand–held mobility device for use by the visually impaired. Also we have presented an algorithm, based on Extended Kalman Filter tracking, that can recognize environmental features corresponding to curbs, steps, and drop–offs. prior experiments in laboratory environment have given promising results.

CHAPTER 3

ANALYSIS OF RECOMMENDER SYSTEM

3.1 EXISTING RECOMMENDER SYSTEM

There has been a rapid development of the reliable face recognition algorithms in the last decade. The traditional face recognition algorithms can be categorised into two categories: holistic features and local feature approaches. The holistic group can be additionally divided into linear and nonlinear projection methods.

Many applications have shown good results of the linear projection appearance-based methods such as principal component analysis (PCA), independent component analysis (ICA), linear discriminate analysis (LDA), 2DPCA and linear regression classifier (LRC) .

However, due to large variations in illumination conditions, facial expression and other factors, these methods may fail to adequately represent the faces. The main reason is that the face patterns lie on a complex nonlinear and non-convex manifold in the high-dimensional space.

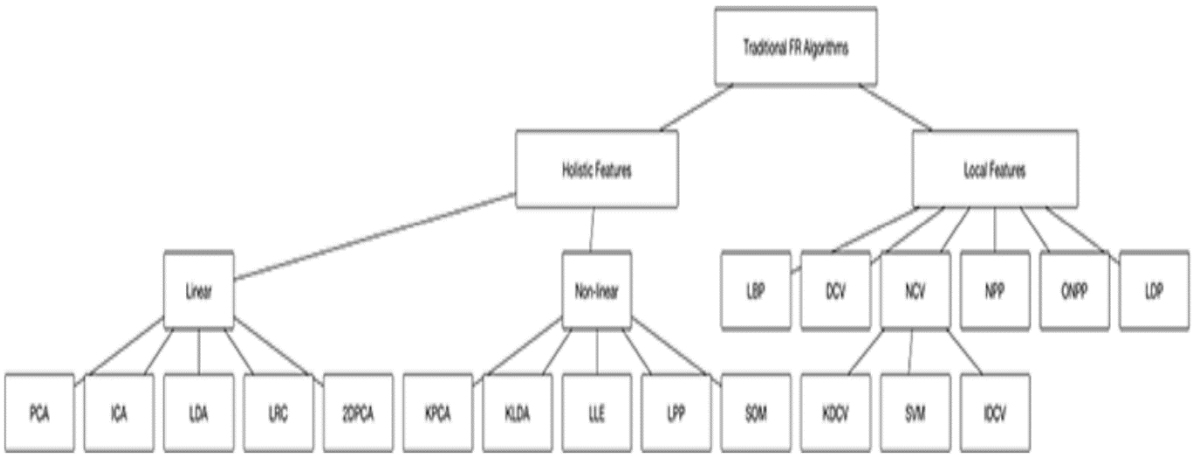


Fig 3.1. Classic Face recognition Process.

These methods project face onto a linear subspace spanned by the eigenface images. The distance from face space is the orthogonal distance to the plane, whereas the distance in face space is the distance along the plane from the mean image. These both distances can be turned into Mahalanobis distances and given probabilistic interpretations [7].

DISADVANTAGES:

These methods may fail to adequately represent faces when large variations in illumination facial expressions and other factors occur. Regarding to [7], applying kernel-based nonlinear methods do not produce a significant improvement comparing to linear methods. LLE, LLP and LBP brought simple and effective way to describe neighboring changes in face description. Subspace approaches were applied in DCV- and SVM based methods. Preserving the local structure between sample in the domain of NPP and ONPP methods. The problem is that it is still unclear how to select the neighborhood size or assign optimal values for them.

3.2 PROPOSED RECOMMENDER SYSTEM

Research Design

Research will be experimental in nature. These modules are used for designing the computer programs for a Recommender System.

It will involve**:**

(a) Open CV

(b) NumPy

(c) Keras

(d) Pillow

(e) Engine

(f) Pooling

Need of the study

There are various algorithms proposed in the literature, most of them trying to improve using OpenCV library which provides three best algorithm for recognition which are:

- **Eigenfaces**
- **Fisherfaces**
- **Local Binary Patterns Histograms (LBPH)**

because OpenCV library algorithm is easier to understand and it is very simple to implement. The simpler the algorithm, the better it will perform for example in image compression technique JPEG 2000.

All three methods perform the recognition by comparing the face to be recognized with some training set of known faces. In the training set, we supply the algorithm faces and tell it to which person they belong. When the algorithm is asked to recognize some unknown face, it uses the training set to make the recognition. Each of the three aforementioned methods uses the training set a bit differently.

Eigenfaces and Fisherfaces find a mathematical description of the most dominant features of the training set as a whole. LBPH analyzes each face in the training set separately and independently.

In LBPH each images is analyzed independently, while the eigenfaces method looks at the dataset as a whole. The LBPH method is somewhat simpler, in the sense that we characterize each image in the dataset locally; and when a new unknown image is provided, we perform the same analysis on it and compare the result to each of the images in the dataset. The way which we analyze the images is by characterizing the

local patterns in each location in the image. LBPH method for face recognition, will probably work better in different environments and light conditions, however, it will depend on your training and testing data sets. You will need around 10 different images of this person's face in order to be able to recognize him/her.

Methodology

1. Gathered the source data required.
2. Organized the data in required format and remove unimportant data.
3. Derived few conclusions using small engine.
4. Based on conclusion data a feature vector and data is defined.
6. Used PyCharm to train the data sets.
7. Run the program to obtain the required result.
8. If it matches then display the voice output and if does not match then display the necessary output.

Parameters

Include

(a) People faces,

(b) Objects,

(c) Other collected inputs.

3.3 TECHNOLOGY USED

3.3.1 FACE RECOGNITION

A facial recognition system is a technology capable of identifying or verifying a person from a digital image or a video frame from a video source. There are multiple methods in which facial recognition systems work, but in general, they work by comparing selected facial features from given image with faces within a database. It

is also described as a Biometric Artificial Intelligence based application that can uniquely identify a person by analyzing patterns based on the person's facial textures and shape.[8][1][10]

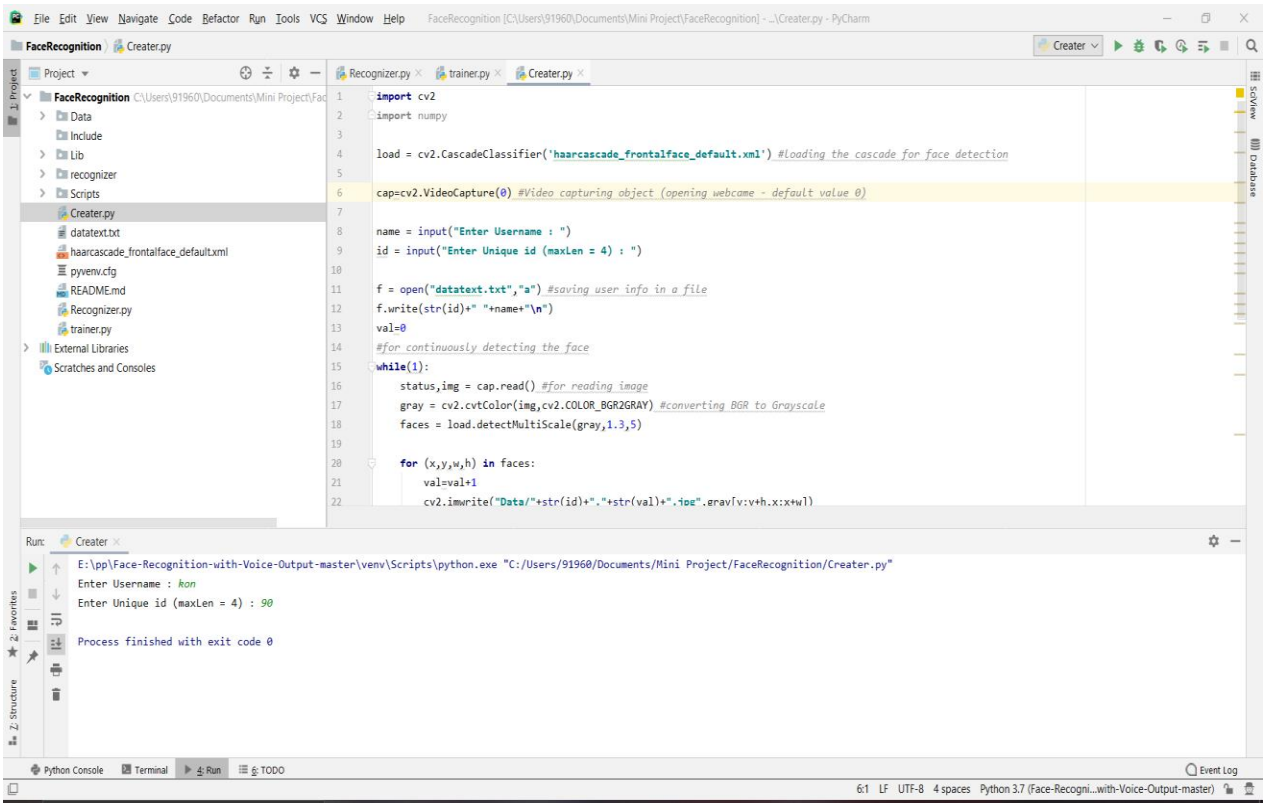


Fig 3.2. Execution Process.

While initially a form of computer application, it has seen wider uses in recent times on mobile platforms and in other forms of technology, such as robotics. It is typically used as access control in security systems and can be compared to other biometrics such as fingerprint or eye iris recognition systems.[11] Although the accuracy of facial recognition system as a biometric technology is lower than iris recognition and fingerprint recognition, it is widely adopted due to its contactless and non-invasive process.[12] Recently, it has also become popular as a commercial identification and marketing tool.[13] Other applications include advanced human-

computer interaction, video surveillance, automatic indexing of images, and video database, among others.[4]

Fig 3.3. Input process for face recognition system.

3.3.2 IMAGE RECOGNITION

Image Recognition is a term used to describe a set of algorithms and technologies that attempt to analyze images and understand the hidden representations of features behind them and apply these learned representations for different tasks like classifying images into different categories automatically, understanding which objects are present and where in an image, etc. These technologies leverage various traditional computer vision methods as well as machine learning and deep learning algorithms to achieve required results for solving such problems.

Data preprocessing describes any type of processing that is performed on raw data to ready it for another processing procedure. Hence, preprocessing is the initial step which transforms the data into a format that will be more easily and effectively

processed. In order to achieve higher recognition rates, it is important to have an effective preprocessing stage, therefore using effective preprocessing algorithms. Preprocessing techniques are needed on color, binary document or grey-level images containing text and/or graphics.

Fig 3.4. Recognition system for an object deduction.

Following are some of the techniques for character recognition systems:

- Image Enhancement Technique: To remove noise or correct the contrast in the image.
- Thresholding Technique: To remove the background containing any scenes, watermarks etc.
- Page Segmentation Technique: To separate graphics from text.
- Character Segmentation: To separate characters from each other.
- Morphological Preprocessing: To enhance the characters in cases.

There are a lot of more preprocessing techniques that will be used according to the need of a given system [15].

CHAPTER 4
ARCHITECTURE

4.1 ARCHITECTURE DIAGRAM

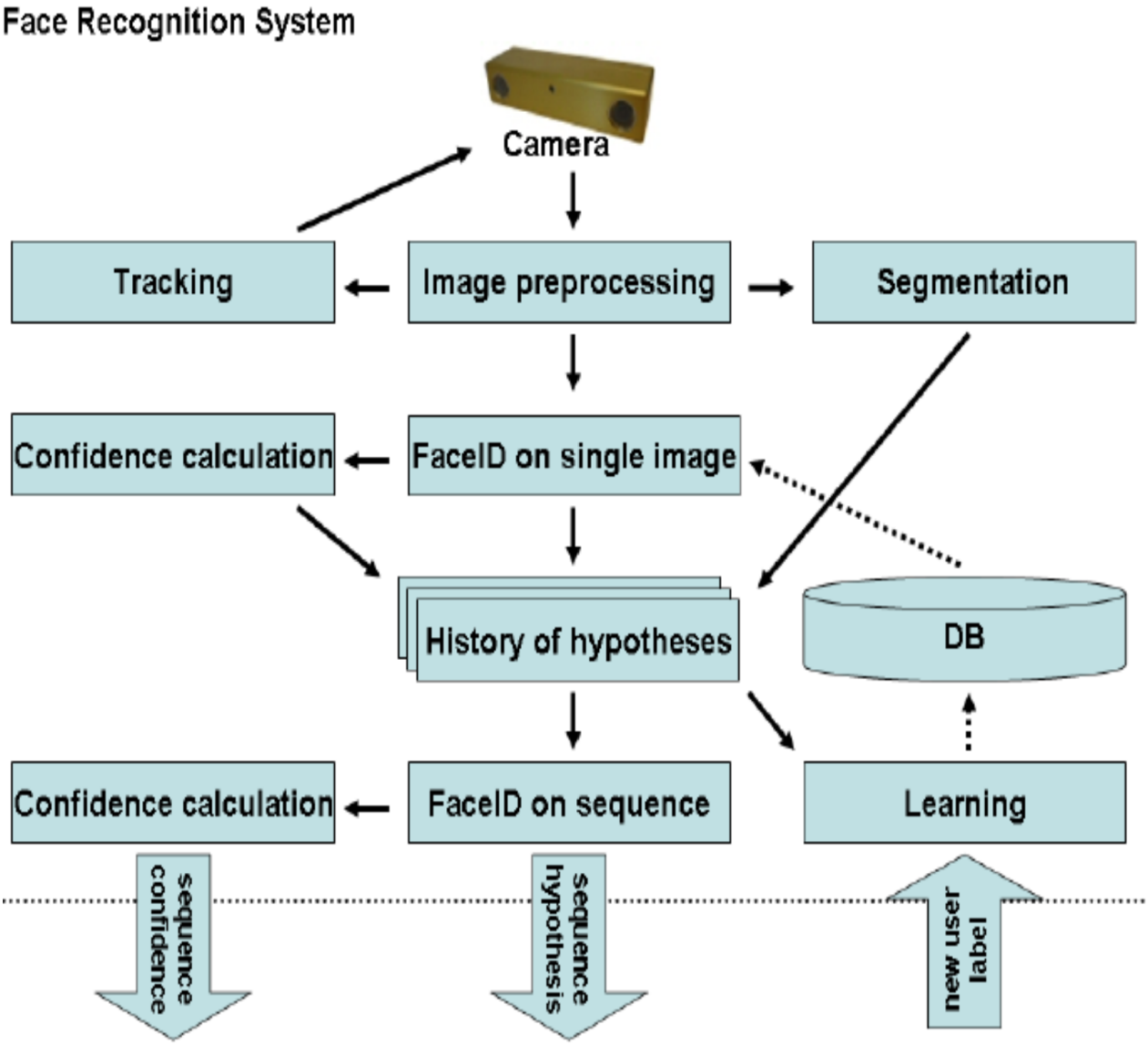


Fig 4.1. Architecture of recognition system

4.2 ARCHITECTURE IMPLEMENTATION

As the blind people are more vulnerable to the unknown than the sighted people, an assistant is required when they want to go outdoor, as we have discussed earlier it seems quite challenging to take an animal assistance as there is a high chance of the animal to be harm also. So, it is better to use technology as it can protect the user and does not get hurt. When people display a facial expression, we make judgments not only about their affective state, but also about their behavioral tendencies and traits. For example, when people display happy faces, we perceive them as having traits associated with high affiliation and high dominance.

When they display angry faces, we perceive them as having traits associated with low affiliation and high dominance. The proposed architecture represents the number of subregions into which the face image is divided. The host sends the test face image to the cropping unit. The cropping unit divides the face image into sub-regions and place each of these sub-regions onto an R-BUS. The R-bus in turn feeds the corresponding processing elements with the sub-region. The function of the processing element is to perform PCA on the sub-region and multiply the estimated error of the sub-region with the corresponding variance measure which is obtained from the training phase [6].

Each has its own local memory where the eigenvectors, intra-subject variance measures and weights of each sub-regions obtained in the training phase are stored. The places the error of the input image with respect to each of those in the database on the O-BUS. The summing unit collects these errors from each O-BUS and generates the net error. The host sorts all the net errors and outputs the best of the matches, whose net error falls below the rejection threshold. Using this architecture, a System on Programmable Chip for Face Recognition was developed. We were able to achieve a speed suitable for real-time applications.

CHAPTER 5
SYSTEM REQUIREMENTS

Hardware:

-12.1.1 Pc

-CPU 2.0 Ghz

-Ram 8 gb

-Hardisk 5 gb of free space

Software and libraries:

-Windows 7 or 10

-PyCharm

-OpenCV

-NumPy

-Keras

-Pillow

-Engine

Samples:

Data of known and unknown faces.

Language used for programming

Language used is Python.

CHAPTER 6
IMPLEMENTATION

6.1 Flow stream

All users were grouped in to various streams based on their imparity and the recognition flow will be maintained as shown in the diagram below.

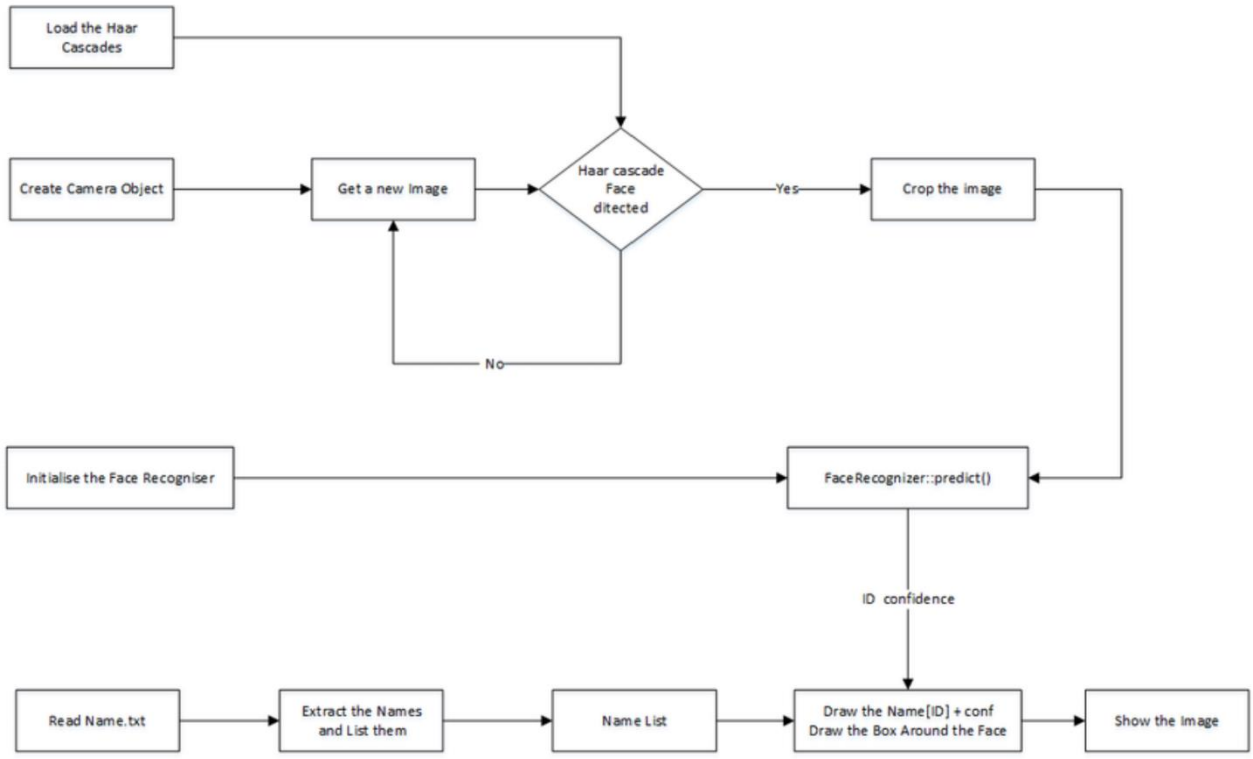


Fig 6.1. Recognition Flow Stream

6.2 Dataset for face detection

The data prepared and selected employed a dataset of nearly 1500 unknown faces from various areas. All user data include records from various streams. Concentrating on required data only, no personal data is involved so that no person can be identified

individually in this research, keeping the matter confidential. Random data is selected from whole database and all private information is deleted. After the process of data collection, data is reformatted in the data transformation stage. The person records are dissociated into different cases and each case is dissociated into training and testing data sets.

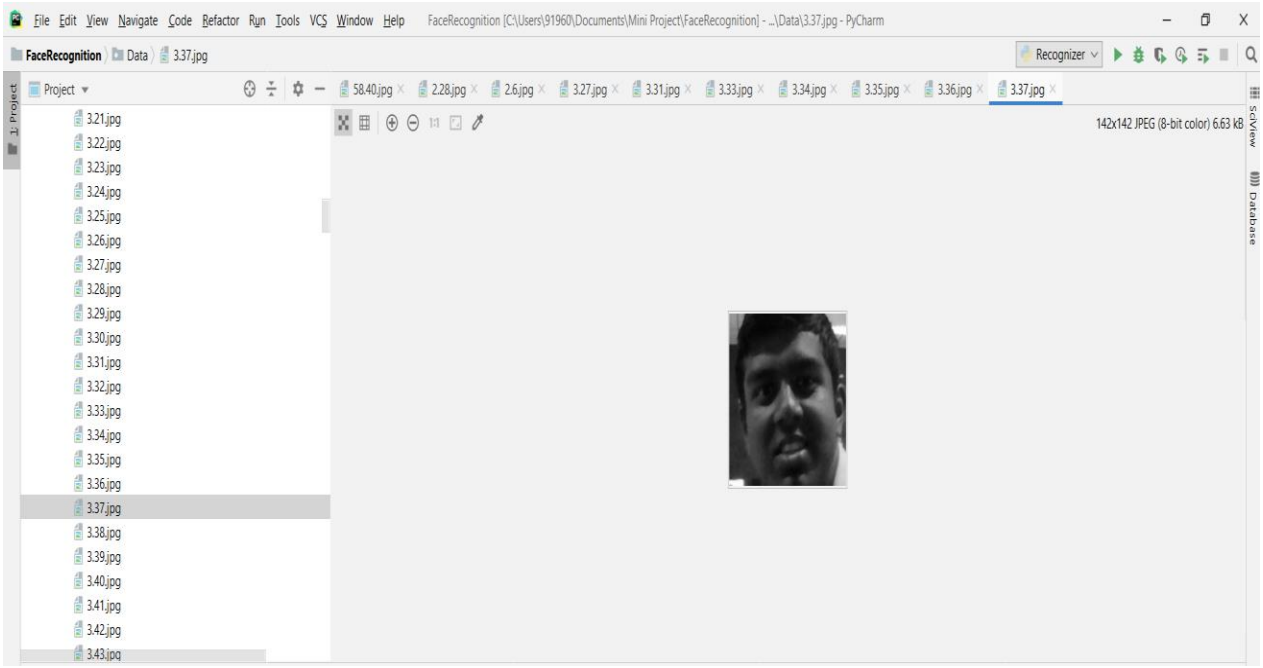


Fig 6.2. Image dataset for face

6.3 Dataset for currency detection

The data prepared and selected employed a dataset of nearly 50 currency notes. All user data include records from various streams. Concentrating on required data only, no personal data is involved so that no person can be identified individually in this research, keeping the matter confidential. Random data is selected from whole database and all private information is deleted [10]. After the process of data collection, data is reformatted in the data transformation stage. The person records

are dissociated into different cases and each case is dissociated into training and testing data sets.

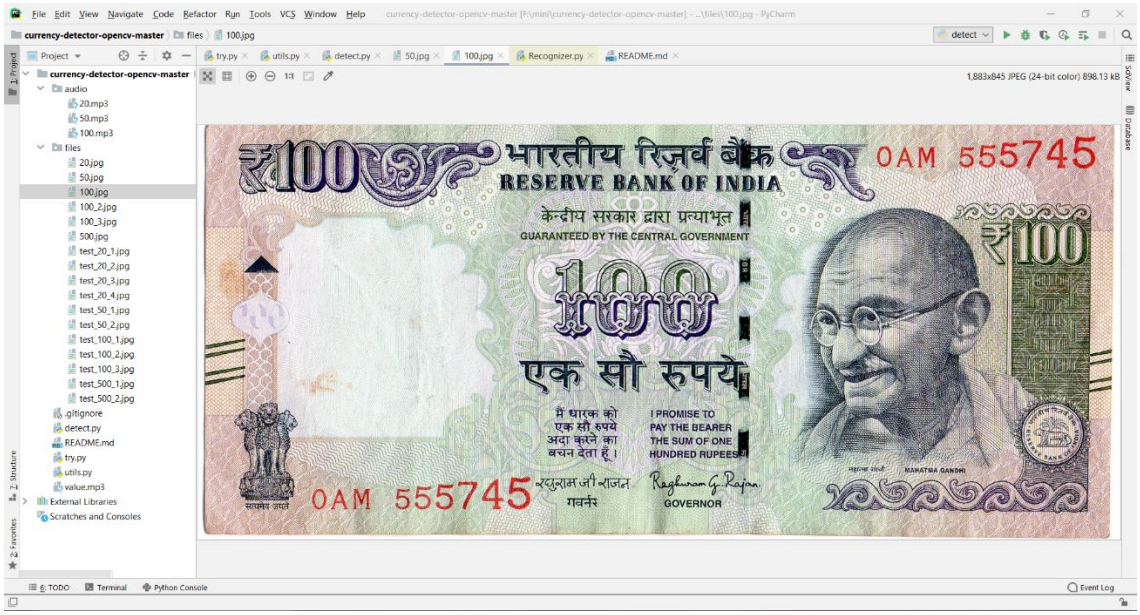


Fig 6.3. Image dataset for currency

6.4 MODULE 1 – Image Acquisition and Enhancement

A digital image is produced by the Webcam or through mobile camera. The obtained image is next moved on to the enhancement process, where the visual quality of the image is improved and the hidden details are revealed by the techniques, Spatial domain method, transform domain method. Spatial domain method operates directly on pixels and transform domain method operates on the Fourier transform of an image & then transform it back to spatial domain.

6.5 MODULE 2 – Image Restoration

Image restoration is the operation of taking a corrupted/noisy image and estimating the clean original image. Corruption may come in many forms such as motion blur,

noises and camera miss focus. Used to remove the noise in the original image. Noise occur due to camera shake, less light etc. Filter are used to remove noise.

6.6 MODULE 3 – Segmentation

Partitioning of image into sets of pixels. Classified as two techniques: Local Segmentation and Global Segmentation. Local Segmentation: Segmenting sub-images which are small windows on a whole image. Number of pixel available to local segmentation. is less than Global segmentation.

Global segmentation is Segmenting whole image. The goal of segmentation is to simplify or change the representation of an image into something that is more meaningful and easier to analyze [11].

6.7 MODULE 4 – Image Recognition and AUI

Image recognition is the ability to perceive an object's physical properties (such as shape, color and texture) and apply semantic attributes to the object, which includes the understanding of its use, previous experience with the object and how it relates to others. Based on the attributes a matrix is created with which image comparison is done. If the image is identified, the output is laid out by the Audio user interface.

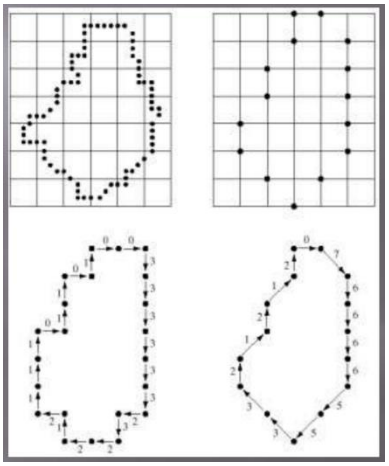


Fig 6.4. Image recognition

CHAPTER 7
RESULTS OBTAINED

7.1 Friends Identification:

The recognition process captures the image data of the friends (known person), stores into the training data sets and validate the image whether the input image is already in the database or not. If yes, then voice output is laid out by AI else no output is laid out by AI for unknown person.

Figure 7.1 Screenshot displaying the voice output with an acknowledgment number.

7.2 Currency detection:

Currency identification is a method depend on Artificial Intelligence methods and adaptive systems, combining Neural Network methods with the Simulated Annaling method, gives the value of the detected currency.

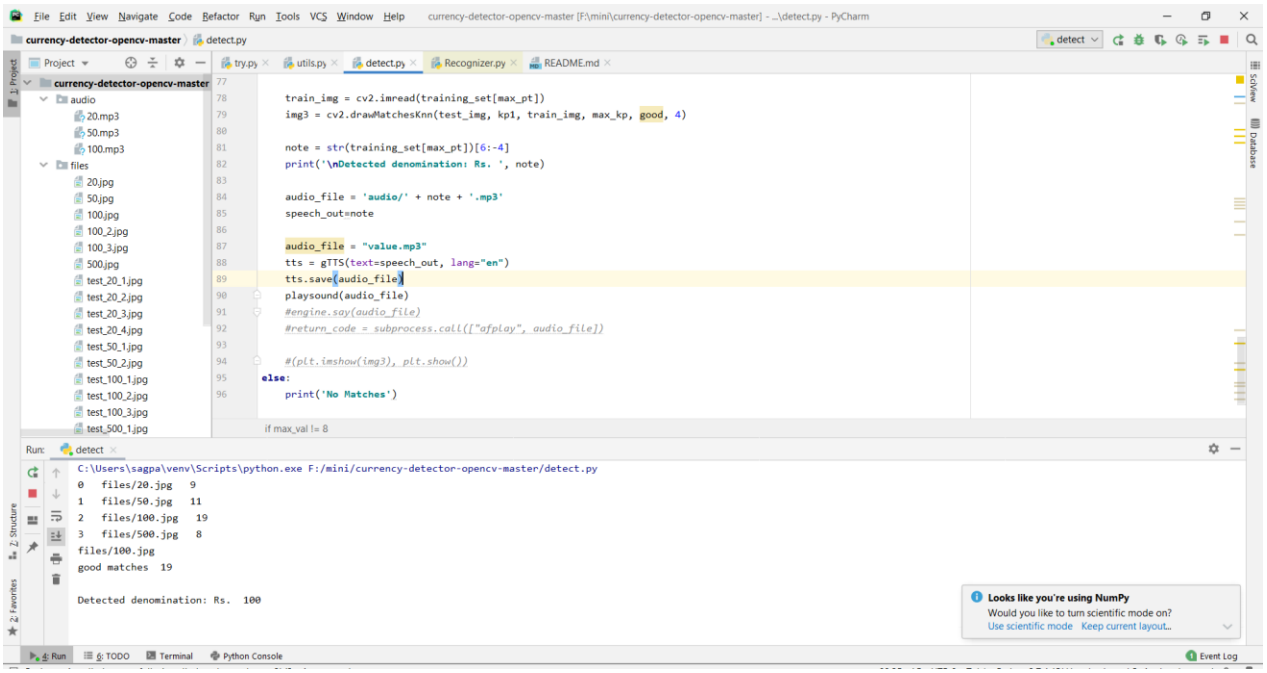


Figure 7.2 Screenshot displaying the voice output of the detected currency

7.3 Add to database:

If a known person approaches whose image is not stored in the data sets, then by the process of Dynamic capturing the image will be stored as a file type of .jpeg format with a name given by the user.

7.4 Result Analysis:

7.4.1 Validity:

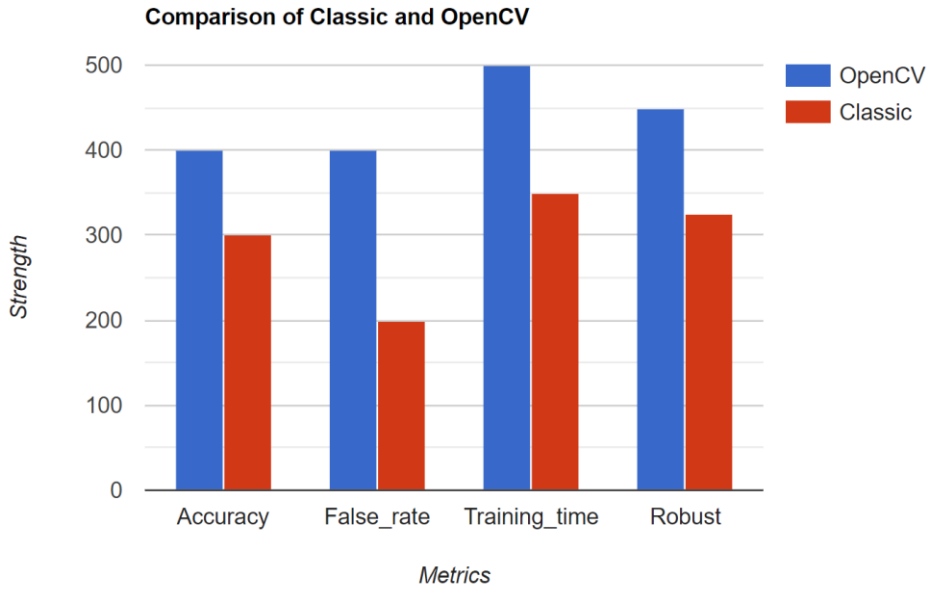
The user was given the ability to capture the input image of the unknown persons with the help of AI program which was most suitable for recognition processing system. User satisfaction was seen in 95% cases. The recommender system designed suggested suitable information based on training data sets to uphold users decision. At last user were able to find the final voice output related to the person. The data of image person faces was fed into computer and results were laid out and the satisfaction level is achieved.

7.4.2 Reliability:

The results given by the program were reached with the satisfaction level and found reliable meeting the user requirement and satisfaction level of the users in their desired process.

7.4.3 Comparison between traditional and modern system:

Algorithm	Advantages	Disadvantages
Classic	1. High detection accuracy 2. Low false positive rate	1. Computationally complex and slow 2. Longer training time 3. Less accurate on black faces 4. Limitations in difficult lightening conditions 5. Less robust to occlusion
OpenCV	1. Computationally simple and fast 2. Shorter training time 3. Robust to local illumination changes 4. Robust to occlusion	1. Less accurate 2. High false positive rate



CHAPTER 8
CONCLUSION AND FUTURE ENHANCEMENTS

Artificial Intelligence has been enhancing the life of the vision impaired. The technology too is vastly growing day by day and improving the other aspects of life those who are in need of someone to take care of them such as disabled, autism, elderly, blind and other such people. To help such people, the machine needs to understand the feeling by itself and have empathy in order to solve the problem. However, Artificial intelligence experts and researchers are still trying to build a machine to achieve it. Definitely within few decades from now, machines will be able to understand the feeling of the humans and solve problem accordingly, at that time, diagnosis for psychological treatment and other such mentally chronic problems can be treated by the machine.

CHAPTER 9
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