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BUS PASS RECOGNIZER SYSTEM USING RASPBERRY PI

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ABSTRACT

The Bus Pass Validation is a much underrated topic in bus travelling. To address this issue, we created a" Bus pass Recognizer System", the main purpose of this project is to build a face recognition-based bus pass validation system for educational institution, etc which gives bus travelling services, to enhance and upgrade the bus pass validation system into more efficient and effective as compared to before. It is basically a python based system which uses OpenCV library for computer vision and face scanning and validation. The current old system has a lot of ambiguity that caused inaccurate and inefficient of bus pass validation and cross-checking. Many problems arise during the validation of bus pass like free travelling, non-renewal of bus pass, etc. in the old system. The technology working behind will be the face recognition system. The human face is one of the natural identities for one's individual. Therefore, it is used to trace identity of a specific individual. In this project, face databases will be created to pump data into the recognizer algorithm. Then, when the candidates need to stand in front of camera, then faces will be compared against the database to seek for identity. When the candidates data is matched then the system will recognize if the candidate is having a valid bus pass or not automatically. We can also use Raspberry pi as an additional configuration, because many buses doesn't have digital board to run the system and we can use Raspberry pi to run the system.

Keywords: Bus Pass Validation, Free Travelling, Computer Vision, Face Scanning, Opencv, Raspberry Pi, Recognizer Algorithm, Python, Face Recognition.

I. INTRODUCTION

The "The Bus Pass Recognizer System" has been developed to override the problems prevailing in the practicing manual system. This system is supported to eliminate and, in some cases, reduce the hardships faced by this existing system. Moreover, this system is designed for the particular need of the company or colleges, organizations, etc, to carry out operations in a smooth and effective manner.

This System is reduced as much as possible to avoid errors while entering the data and verifying the data. It also provides error message while verifying the invalid data. No formal knowledge is needed for the client to use this system. Thus, by this all it proves it is user- friendly. Bus Pass Recognizer, as described above, can lead to error free, secure, reliable and fast bus pass management system. It can assist the client to concentrate on their other activities rather to concentrate on the manual record keeping and record verifying. Thus, it will help organization in better utilization of resources.

Every organization, colleges whether big or small, has challenges to overcome and managing the bus pass information of employees, students etc. The main of the IoT project is to manage and verify the bus pass data of students, employees, etc.

This System helps clients manage and verify the data of bus passes and further upgrade the data. It is designed such a way that pass holder just need to scan face of camera and it will verify the bus pass and give access. The system will help in easy maintaining, verifying and updating bus pass data of the clients, organization, etc.

II. LITERATURE REVIEW

1. **A. S. Tolba, A.H. El-Baz, and A.A. El-Harby "Face Recognition: A Literature Review" [1]**:- FACE recognition is an important research problem spanning numerous fields and disciplines. This because face recognition, in additional to having numerous practical applications such as bankcard identification, access control, Mug shots searching, security monitoring, and surveillance system, is a fundamental human behaviour that is essential for effective communications and interactions among people. Face recognition starts with the detection of face patterns in sometimes cluttered scenes, proceeds by normalizing the face

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images to account for geometrical and illumination changes, possibly using information about the location and appearance of facial landmarks, identifies the faces using appropriate classification algorithms, and post processes the results using model-based schemes and logistic feedback [3]. The application of face recognition technique can be categorized into two main parts: law enforcement application and commercial application. Face recognition technology is in The commercial applications range from static matching of photographs on credit cards, ATM cards, passports, driver's licenses, and photo ID to real-time matching with still images or video image sequences for access control. Each application presents different constraints in terms of processing Real-time Driver Drowsiness Detection based on Driver's Face Image Behavior using a System of Computer Interaction Implemented in a Smartphone (2018) Developed a system that utilized a smartphone's camera for real-time driver surveillance. Leveraged Artificial Vision Techniques to analyze facial expressions and movements. Implemented a system of computer interaction within a smartphone for efficient drowsiness detection. Demonstrated promising results in terms of real-time and accurate identification of drowsiness-related behaviors.

2. **Yassin Kortli , Maher Jridi, Ayman Al Falou& Mohamed Atri "Face Recognition System: A Survey"[2]:-** Systems that identify people based on their biological characteristics are very attractive because they are easy to use. The human face is composed of different structures and characteristics. For this reason, in recent years, it has become one of the most widely used biometric authentication systems, given its potential in many applications and fields. Facial recognition system as an ID (identity) is already being offered to consumers outside of phones, including at airport check-ins, sports stadiums, and concerts. In addition, this system does not require the intervention of people to operate, which makes it possible to identify people only from images obtained from the camera. However, it would be interesting to develop new biometric systems for face recognition in order to reach real-time constraints

PROBLEM STATEMENT

As Bus travelling has become a major source of travelling nowadays. The companies, colleges, organizations, etc. are using buses for their employees, students, etc. The client face various issues during managing, updating and verifying the bus pass data of the users like hoax and proxy passes, manual verification of bus passes, without bus pass travels, etc. Thus resulting in financial and resource loss of the clients.

III. METHODOLOGY

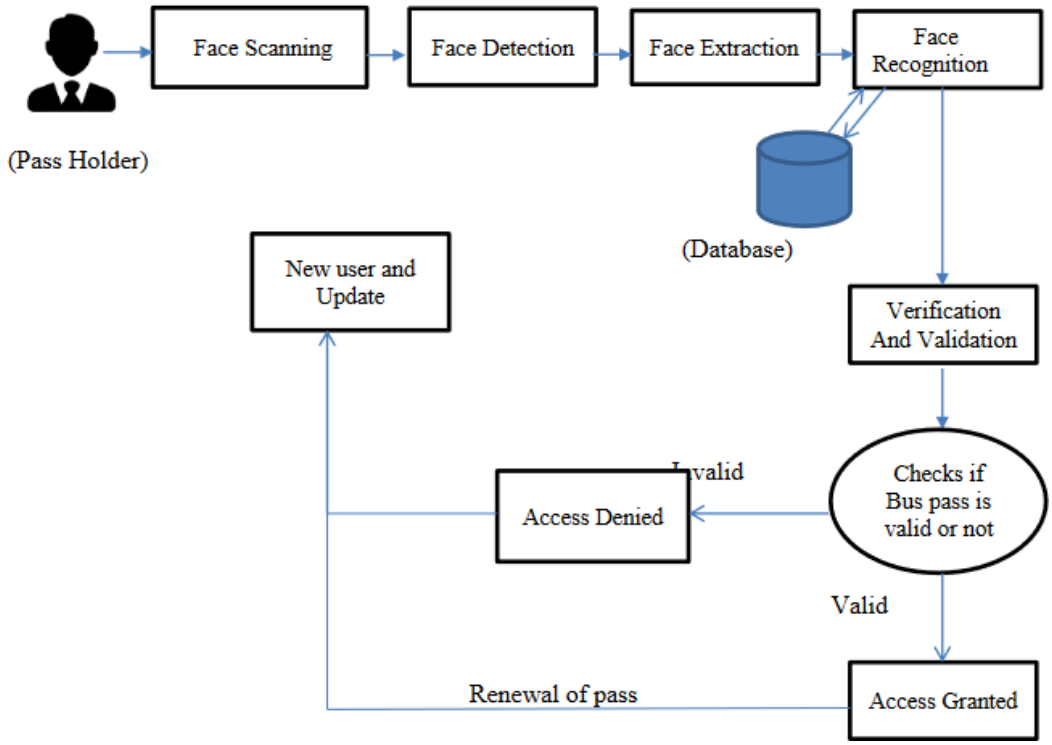

Fig: Bus Pass Recognition Process

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1. Face Scanning:

- In this the Pass Holder will get in the bus and the user's face will get scanned by the bus Camera.

The interface provides a home screen for user(like sign in ,etc)

2. Face Detection:

- In this module, the Bus camera will only scan the face of the pass holder and the face scan data will get into the software for face recognition.

3. Face Recognition:

- In this Module, the scanned face data of the pass holder will get processed and verified by the system. This recognition is done by accessing the database and it will check whether the user has a valid bus pass or not.

4. Access Granted:

- In this module, after the verification and validation of the user by the system, if the user has valid bus pass then the user will get access to travel in the bus.

5. Access Denied:

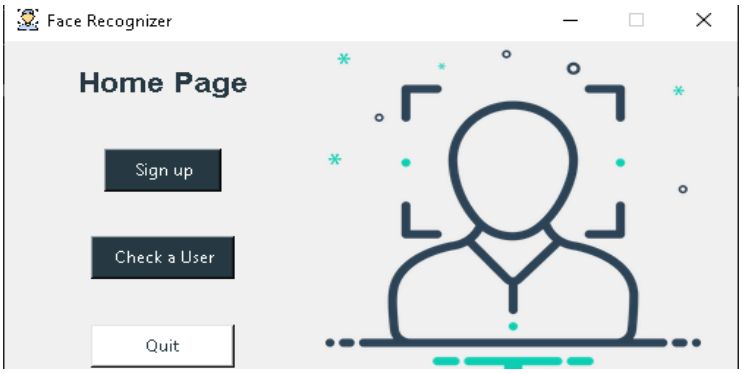
- In this module, if the user doesn't have a valid bus pass, the user will get error message by using speaker and the user will not get access to travel by the bus.

6. New User and Updating:

- In this module, if the user don't get the access the user gets option to register for the bus pass as a new user and the user will get registered in the database. And if the valid user wants to renewal the pass, then user can renew the pass and the database will get updated.

IV. RESULTS AND DISCUSSION

Home page:



Taking Images and Training Model:

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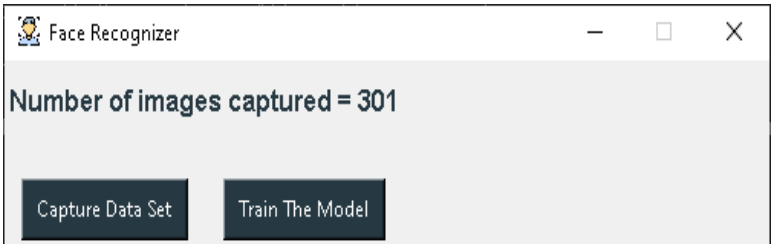
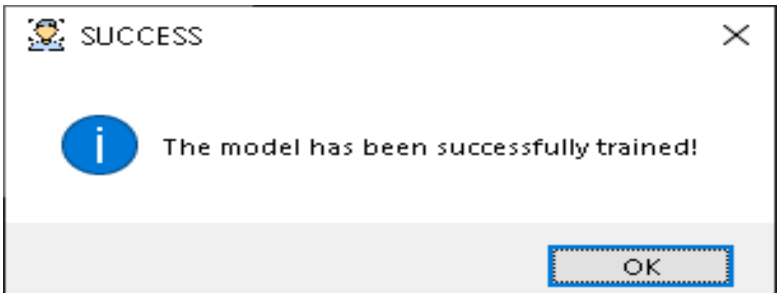
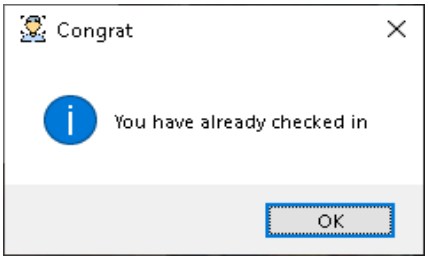
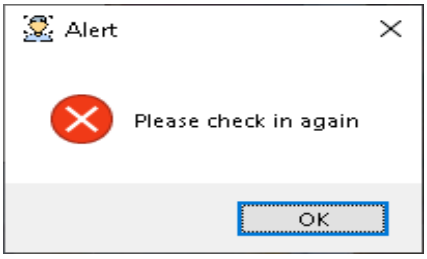




Searching User:-

Face detection and Recognization:-





V. ADVANTAGES

1. "Bus Pass Recognizer System Project" provides various features, which complement the information system and increase the productivity of the system. These features make the system easily usable and convenient
2. Intelligent Face Scanning
3. Data access and manipulation through Face Scanning
4. Access to most required information
5. Data Security
6. Convenient access granting and denial.
7. Restrictive data access, as per Face Recognition System data.
8. Organized and structured storage of facts.
9. Strategic Planning made easy.
10. No decay of old Records.
11. Updation of the Users data.
12. Easy Data Management.

VI. LIMITATIONS

1. It is not a large-scale system.
2. Hardware system sometimes may not work properly.
3. Since it is an IoT project, it needs access to internet for Database access and validation.
4. The overall face recognition is time taking process.

VII. FUTURE SCOPE

1. The Bus Pass Recognizer removes most of the drawbacks in manual Bus Pass Checking and it reduces the financial and resources effort of the clients. We can further update the system ,like using biometrics and real time user registeration,etc.

VIII. CONCLUSION

In conclusion, the Bus Pass Recognizer System (BPRS) The project entitled "Bus Pass Recognizer" is developed using Python in back end and front end, OpenCV Library for face detection and verification to computerize the process of Bus Pass Recognizer. This project covers only the basic features required

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