

Advanced Online Examination using Raspberry Pi Based on IoT

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Abstract— Education is one of the main needs for man to develop socially and intellectually. Today need of exams in universities, schools, colleges and even companies for recruitment process .The general paper-pen exams are now being slowly replaced by the online internet based exam system .But on this manual system of writing examination has introducing many demerits. Manual examination process is time consuming and tedious, but student need faster and more reliable examination i.e. online examination. Online examination is referred as an e-examination which is conducted through internet or intranet.

Key words: Raspberry Pi, Open CV, Python, Face Recognition, Raspbian

I. INTRODUCTION

In this paper, we have proposed advance online examination based on IoT system. Here we initially all the examination details are stored in the server. Then if someone wants to starts online examination, first they should apply face recognition (in Open CV based) technique. Because some time unwanted person also enter to write the exam, so this is the best way to identify any culprits are found or not. Then examine enter to write the exam, here also I am apply some security. Now a day's already questions are stored in the online or any paper printed copy. But here not like that, if you entered to write the exam that time only teachers are start to write questions on server. This will be printed automatically to the examine browser window. So easy avoid the question paper leakage before the exam. Traditional examinations with pen and paper play an integral part in evaluating the academic results of the students. Currently, with the development of education system, many people argued that this way is not optimal to assess education achievement. To begin with, there are some positive influences of applying conventional examinations in schools. First and foremost, taking exams makes students have more motivation to study hard. Due to the fact that the formal exams indicate the score and rank of students in the class, pupils will try my best not only to not fall behind with their studies but also to to gain good results. In addition, formal "pen and paper" examinations are equal to all students. In detailed, traditional examinations require students to sit an exam which has the same condition & level so cheating will not occur.

On the other hands, there are some drawbacks of considering formal examinations as the best method to assess the results of students. Firstly, that attending exam is a compulsory way can create unreliable pressure for scholars. It is clearly seen that when students study under pressure, they will fell tired and as a result, these learners will not make the grade in studying. Secondly, "pen and paper" examinations are not fair to students who are bad at performing knowledge in the paper. For instance, a huge number of scholars have the advantages of verbal performance rather than in writing. Others are better at body movements of different talents such

as dancing or acting. Therefore, schools should carry out versatile kinds of skills in exams to provide fail opportunities for students who are good at different aspects. Moreover, to remember and use the knowledge in the life, students must practise again and again, hence, continuous assessment at all times ought to implement to evaluate students' achievements.

II. METHODOLOGY

Figure 2.1 shows block diagram of Online Examination in which Raspberry Pi is main controller which used to conduct examination. Camera connected to Raspberry Pi used for face recognition. Monitor is used to display GUI.OS is stored in SD card.

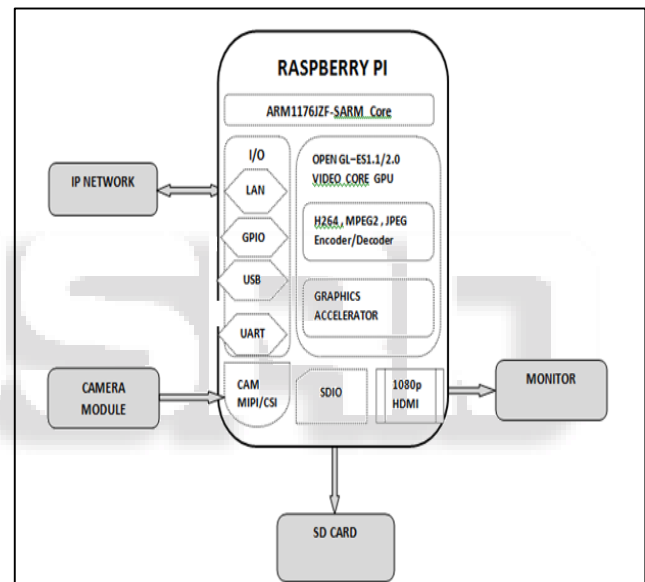


Fig. 2.1: Block Diagram of Online Examination

A. Software Development

In software system development, the face recognition method is completed in OpenCV. The system is developed victimization pc Vision tool case, applied mathematics and Image Acquisition tool case. Eigen faces methodology: an initial set of pictures of faces are accustomed produce a coaching set. The quantity of face shots of every person keep within the information depends on what quantity processing time they'll take. These faces are then de-escalated into individual vectors. The magnitude of every vector represents the brightness of individual sectors of the grey scale image. A variance matrix is created by normalizing these vectors. After this, eigenvectors are derived from this variance matrix and a collection of eigenvectors of a picture forms an Eigen face. Eigen face helps in precisely focusing at the most face features instead of the total face information. In different words, it permits to find the load of every face.

When a replacement face image is non-inheritable the load of that face is calculated then deducted from the every of the weights of different pictures within the

information. Those distinction numbers represents what quantity completely different every image is from the initial image. The lower the quantity the nearer is that the match. This distinction is additionally referred to as the easy lay geometer distance.

Image acquisition: during this method, the input face image is captured via integrated digital camera. Once the input image is captured, the options information are extracted. the aim of image acquisition is to hunt and extract an area that contains solely the face.

Pre-processing: In pre-processing, the non-inheritable image is resized to a particular size and backbone. The image is resized to 180x200 pixels. Dimensionally reduction is completed by pressing the initial options while not destroying the necessary information from the image.

Feature Extraction: this technique used global options approached for feature choice. Global options approach weights every element equally regardless it's the face element or the background element. This approach will cipher the whole face and represent face as a code purpose in higher dimensional image area.

B. Hardware Development using Raspberry pi

The Raspberry Pi is a series of credit card sized single-board computers developed in the United Kingdom by the Raspberry Pi Foundation to push the teaching of basic computer science in colleges and developing countries. Raspberry Pi 2 includes a quad-core Cortex-A7 C.P.U. running at 900 megacycle per second and one GB RAM. it's represented as 4–6 times additional powerful than its forerunner. The GPU is similar to the initial. The Raspberry Pi doesn't have a built-in real clock, and doesn't "know" the time of day. It have several models All models feature a Broadcom system on a chip (SoC), which incorporates an ARM compatible central process unit (CPU) and an on chip graphics process unit (GPU, a Video Core IV). CPU speed ranges from 700 MHz to one.2 GHz for the Pi three and on board memory vary from 256 MB to 1 GB RAM. Secure Digital (SD) cards ar wont to store the package and program memory in either the SDHC or small SDHC sizes. Most boards have between one and 4 USB slots, HDMI and composite video output, and a 3.5 mm telephone jack for audio.



Fig. 2.2: Raspberry pi

III. RESULT & DISCUSSIONS

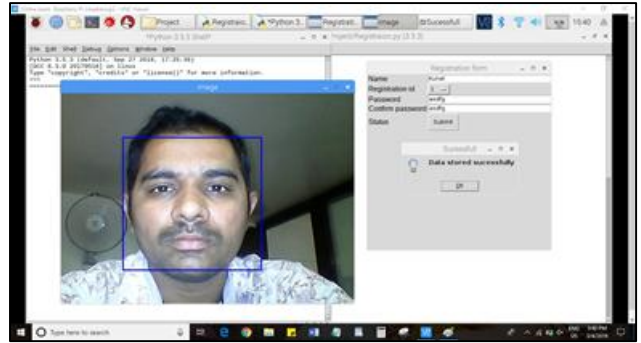


Fig. 3.1: adding new registration by creating dataset

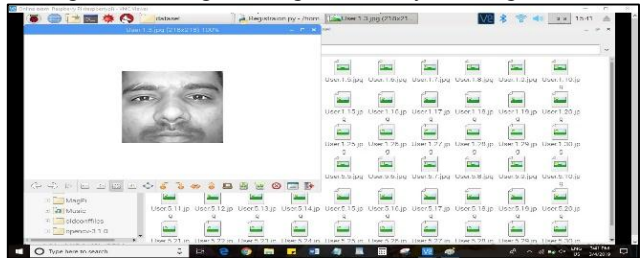


Fig. 3.2: Image stored in dataset folder

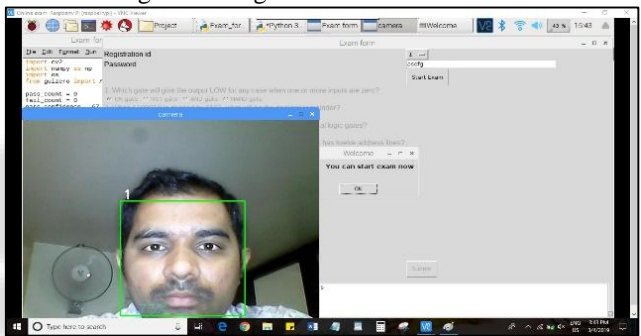


Fig. 3.3: Face Matching From Dataset

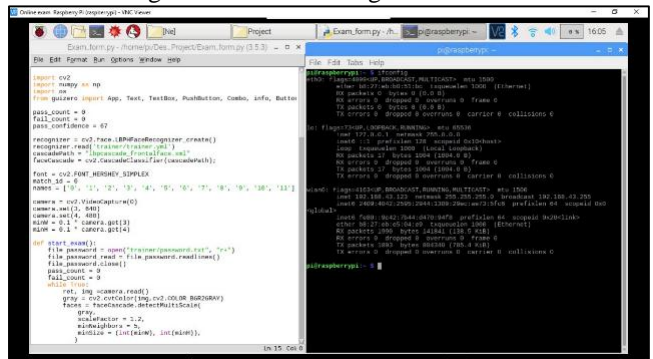


Fig. 3.4: IP A dress of Dataset

A. Result table

Sr No.	Task	Total attempt	Exam starts	Exam not starts
1	Attempt with valid face	10	8	2
2	Attempt with invalid face	10	1	9

Here, we found that the possibility to start an exam with valid face is about 80%.

IV. CONCLUSION

Here, we written the question paper on DJANGO (web Framework). Whenever the face of student is matching with the database then only the page will be opened. Otherwise, if the person detected is unauthorized person then output screen will show it as not recognized. Thus, only the student can appear the exam and the malpractices can be avoided.

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