E-ASSESSMENT USING IMAGE PROCESSING INFINITY EXAM

B.SURYANARAYANA MURTHY,K.DILEEP SAI VARMA

Assistant Professor in DEPARTMENT OF MASTER OF COMPUTER SCIENCE, BHIMAVARAM-534202
Email id: - suryanarayanamurthy.b@gmail.com

PG student, D.N.R. COLLEGE, P.G. COURSES (AUTONOMOUS), BHIMAVARAM-534202.

Email id : ksdvarma1999gmail.com

Abstract : The usage of Multiple Choice Questions (MCQs) to test the knowledge of a person has been increased gradually. These tests can be evaluated either using OMR technology or manually. In real-time, it is quite difficult to have OMR machine under all circumstances and at the same time, manual correction is time consuming and error prone.These disadvantages have overcame in our proposed system by using digital image Processing technique to correct the answers on OMR sheet We are here using Open Source Computer Vision Library (Open CV) to process and correct the answers. Python is the best suitable language to implement this concept with the available Open CV library.

Index Term: - exam,opencv,MCQ,OMR

I Introduction

There is a growing need for storing paper-based information digitalized nowadays. This problem concerns education as well but it does not always get enough attention, however using our technology accordingly many aspects of the educational process could be made a lot simpler, easier, faster, more comfortable and (partially) automatable.

Most of the educational institutions are using traditional teaching and examination methods in most of their subjects still. Though the digitalization of teaching got a little bit of attention in the previous years and began its growth since then. Alongside it there are also computer-based examination methods but it is not the main functionality of the e-learning systems. So mostly the traditional examination models are used concerning those subjects who require such a way to be examined accordingly. From now on the paper-based examination method will be discussed, since it is the main concern of this paper. The keyword "e-assessment" refers to electronic assessment as software is used to mark the exam papers filled by the students after the exam is completed.

Multiple choices Question (MCQ) are a form of an objective assessment in which respondents are asked to select only correct answers out of the choices from a list. The multiple choice format is most frequently used in educational testing, in market research, and in elections, when a person chooses between multiple candidates, parties, or policies.

In this paper we are using image processing to accomplish the MCQ correction in very easy manner. It produces the great effort to deal to remove the barriers of multi choice assessment correction. In this we are using array format to correct the answer paper which is photo copier and uploaded by user. The main concept is to get the image and get the answer which is shadowed by user
In Python Open CV library is available for image processing. In order to get the best effective output we use the django framework along with python. The Open CV is a library

of programming functions mainly aimed at real-time computer vision. The Following topics are organized to explain the process of how to deal with this technique.

2 Literature survey

Classifications of related systems The primary classification is based on the main functionalities of the given system as follows:
1. Computer-based examination and assessment systems
2. Computer-based assessment systems

It is trivial that the former group of systems give a wider solution and it even seems better and easier to do the whole process this way but it is not in every case for certain,

moreover usually it is not even worth it. Though it implies that most of the related work in the previous 10+ years discusses these kinds of systems, since these should be the real future of computer-based education Nowadays the examination part of these systems is too futile and only in special cases (e.g. multiple-choice tests) can it fully reproduce the way of its paper-based equivalent. For example, in the USA they wanted to have these kinds ofsystems in every school and they wanted to make it obligatory to take exams this way but the plan have not gone accordingly because many states reported malfunctioning systems and other problems concerning these software systems, so they had to cancel this whole plan [1]

Both categories of the previously stated systems can also be viewed from another aspect since both are also assessment systems which have a so-called intelligence of evaluation. According to the intelligence of evaluation the classification is as follows [2; 3]:

• Manual evaluation, the evaluation of the solutions is done manually, by human resources

. • Quasi-automatic evaluation, the system is able to evaluate the major part of the solutions automatically, still a smaller part of them are evaluated by the teacher.

• Automatic evaluation, the system is able to evaluate all answers automatically

Computer-based examination and assessment systems

As it was mentioned earlier most of the related work consists of this class of approach to the problem but below only one of these is highlighted. The reason and the summarization of the highlighted system lie below. The so-called eMax [2; 3; 4; 5] system which was also made under the roof of Obuda University, John von Neumann Faculty of Informatics, provides quasi-automatic evaluation for short text answer questions and special maths tasks. The text can be any input from a keyboard but at the maths tasks there is a required syntax which must be followed to ensure the maximum efficiency of the evaluation algorithms. Because of this restriction many students were not able to adapt well enough to the ways of the system and also the system only proved useful enough in a few cases so the envisioned functionality of the software was not realized. Today the system is still used but sadly not the way it was meant to be. . . The problems of similar solutions are discussed in [6]

Computer-based assessment system

There are some works concerning this class of assessment systems as well but not all of them are completed ones [7] or just simply solve a specific problem this way [8]. As previously only one of these is highlighted below but this time there is no personal connection to it. It is just one of the better ones found during the research.

The paper which will be mentioned already states its approach in its title: "Blended e-assessment: Migrating classical exams to the digital world." [9]. It makes the reader sure about what is the aim of the work; it simply is almost the same as mine. It has a strong argument about the usefulness and importance of such software and even

presents the completed software, moreover summarizes some years of experience with the system with the experiences of the students and the teachers. It also features some key solutions in the software itself which mostly only make it more user-friendly but because of this some of my early thoughts of such software got verified

3. Implementation Study

The Multiple choice Question Pattern is most widely used to assess the details which are necessary. In current scenario Optical mark recognition OMR is most widely used to deal with multiple choice questions. But OMR sheets are corrected by the specialized machines to correct the answers. If you deal it in manually it will be very difficult to handle the data and accuracy also questioned. The manual work needed more effort, time and concentration to make it perfect. The existing system is dealing with many disadvantages.

DISADVANTAGE

The Main disadvantage of existing system is the necessity of the OMR machine to correct the answer. On the other hand the manual work is heavy and problems to deal with accuracy, time delay and people management.

3.1proposed methodology

The proposed system is taking the digital image of the answer sheet in the given pattern and uploads to the given system. In order to correct the answer digital image processing is used to get the answer sheet and proceed it to read the image. This method avoids the machine dependency and people dependency in high manner. This system brings out the effectiveness by using Django framework along with python in order to do image processing. The major impact is open CV library, which is available to access the image to get it as a matrix and make that very effective to deal with correcting answers in the image.

ADVANTAGE

The proposed system is machine independent. The people management is very easy and very effective. It is also more cost effective because of not needed any special machines and resources are also needed very less. So it is very easy to access by dealing with the images.

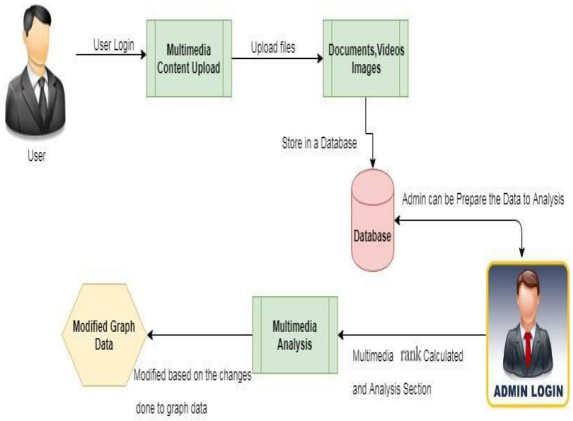

Fig 1:- system architure

3.2 Methodology and Alogrithams

MODULE DESIGN AND ORGANIZATION

The System Design Document describes the system requirements, operating environment, system and subsystem architecture, files and database design, input formats, output layouts, human-machine interfaces, detailed design, processing logic, and external interfaces.

MODULES:

This application has four modules which are listed in the following.

1. Student Management
2. Exam Assessment
3. Result Details
4. Graph Analysis

4.1 MODULE DESCRIPTION:

In this project there are four modules to achieve our expected result. These are the major functionalities of the project. The registration and login process are important to access the project for both users. There are two users' admin (Teacher) and user (Student).

1. Student Management

The students are not directly registered. Faculty is uploading the bulk details of students with details of name, student id, class and so on. Students will receive manually student id from faculty manually. With the username and student id as password, student can authenticate to access the details. The details can be modified by students not by faculty at the same time student cannot modify their student id which given to them.

2. Evaluation using Image Processing

The Faculty will upload the students answer sheets as photos. Those photos can be evaluated with the help of Digital Image Processing technique. It can be achieved with the help of python's opencv library. The matrix form is created with answer key to identify and give the result as per the photos.

3. Result Analysis

The results from the above module are handled by some math functions to put those values into calculations. Get the total marks accomplished by students and average of the student can be calculated by the auto functionalities and display to users.

4. Graph Analysis

The graph analysis is done by the values taken from the result analysis part and it can be analyzed by the graphical representations. Such as pie chart, pyramid chart and funnel chart here in this project.

4 Results and Evolution Metrics

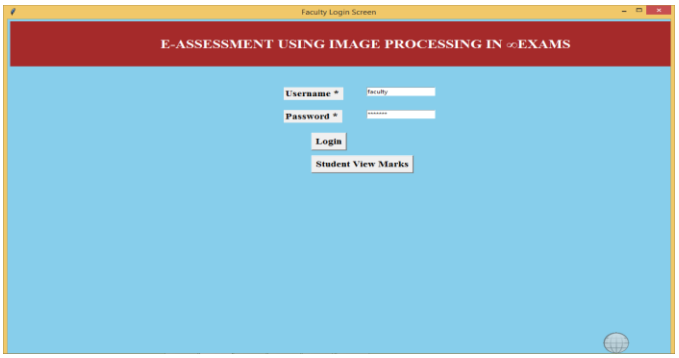

Fig 2:- student login form

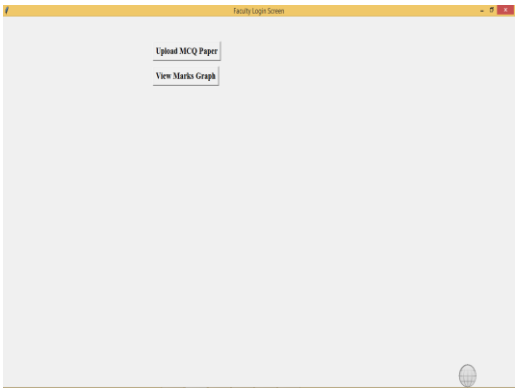

Fig3:-Main page

Fig 4:- upload mcq paper

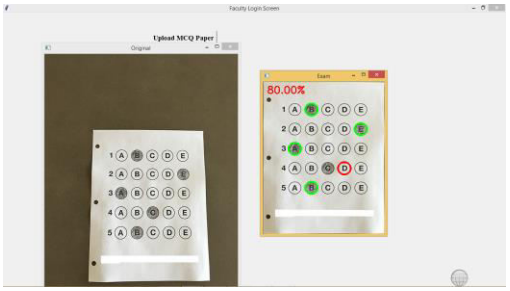

Fig 5:- In above screen we can see student answers at left side image and corrected image at right side where wrong answer mark with red colour. Similarly we can upload any number of images. Each image must have five questions and left side paper must have three dot symbols

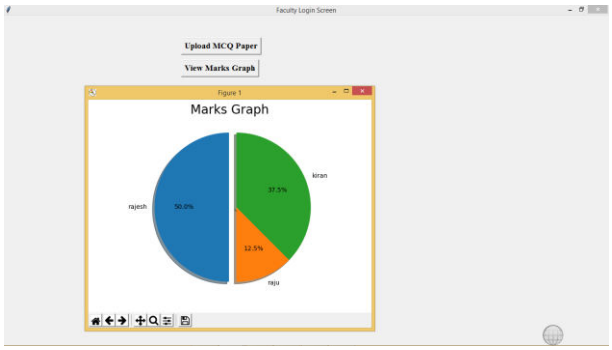

Fig 5:- In above graph we can see marks obtained by each student. Similarly student can see their marks by entering their name. See below screen

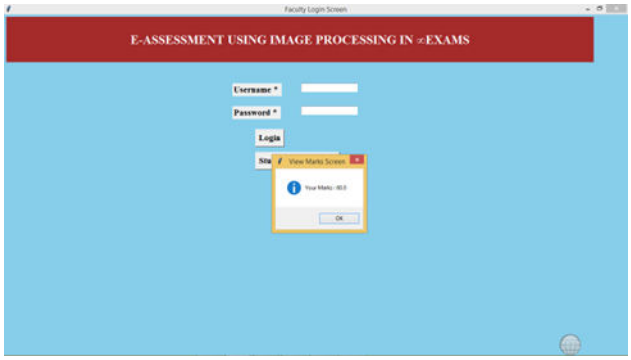

Fig 6:-student can view the marks achived

5 Conclusion

The featured so-called E-Assessment software system is in alpha version which means that the previously envisioned functionalities have been partially implemented and can be used. The software has a desktop application in which the users can generate exam sheets, browse and edit the database, upload images and correct the exams. The already implemented framework gives a nice look at how the whole system will be assembled. At this very moment, the software can only be used in offline mode. The MCQ Test correction is major way of assessment in the current scenario. MCQ Test

format have different way of correction and conducting the tests which is very difficult. The proposed system addresses the issue and solving this problem with the help of Image Processing and Django Framework. Both of these techniques were very handy to solve the problems in MCQ Test Correction. It has its own limitations which are solved in future but as for current scenario it is better solution among the existing ideas. In future can able to have many services to be included in this application.

. 6 References

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