



ONLINE PLATFORM FOR STUDENT ASSESEMENT & EVALUATION USING IMAGE PROCESSING

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Abstract: Online Assessment Evaluation which supports (primarily in higher education) paper - based examination and makes it easier, more comfortable and speed up the whole process while making keeping every single positive attribute of it but also reducing the number of negative aspects. The approach significantly differ from the ones used in the previous 10+ years which were implemented in a such a way that they could not reproduced and replace the traditional based paper examination model. The heart of the article relies on the most important element of the software which is the image processing flow. The way of conducting testing the knowledge of a person using Multiple Choice Questions (MCQ) has been increased gradually. In education institutes (like schools and colleges) it more common now days having test using multiple choice questions. Even in conducting interviews it is used. Current day scenario is either using OMR technology to correct the test or manually. In real time it is quite difficult to have OMR at all the time and manually it is highly taking the time to correct and it may give you the error. We address this issue, in our proposed system we using digital image processing technique to correct the answer using multiple choice questions in python. We are here using Open Source Computer Vision Library (Open CV) to process and correct the answer. Python is the best language to implement this concept with the available Open CV library.

Index Terms –OpenCV, OMR sheets, MCQs, Online Assessment.

I. INTRODUCTION

There is growing need for storing paper-based information digitalized nowadays. This problem concerns education s 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 method in most of their subjects still. Though the digitization 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 system. So mostly the traditional examination models are used concerning those subjects whose 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 Choice Question (MCQ) is a form of an objective assessment in which respondents are asked to select only correct answers out of the choice from the 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 -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 is most frequently to correct the answer paper which is photo copier and uploaded by user.

The main concept is to get image and get the answer which is shadowed by user. In Python open CV library is available for image processing. In order to get best effective output we use the Django framework along with python. The open CV is a library of programming function mainly aimed at real time computer vision. Online assessment evaluation using image processing is a project that aims to automate the process of evaluating student assessments, such as handwritten exams, quizzes, and assignments, using image processing techniques. The traditional method of manually evaluating assessments can be time-consuming and prone to errors, and this project seeks to overcome these challenges by providing a fast and accurate automated solution. The project involves capturing images of student assessments using a camera or scanner, and then processing these images using image processing algorithms to extract relevant information such as text, symbols, and diagrams. The extracted information is then analyzed using machine learning algorithms to determine the correctness of the answers and generate scores for each assessment. The system can also provide feedback to students on their performance and generate reports for teachers and administrators. Overall, this project has the potential to revolutionize them.

II. LITERATURE SURVEY

There are several approaches that can be used in computer-aided teaching of discrete mathematics and linear algebra. One such approach is through interactive learning tools such as Geogebra and Desmos. These online tools allow students to visualize and manipulate mathematical concepts, such as graphing linear equations and matrix transformations, in a more interactive and dynamic way. This can help students better understand the abstract concepts and develop a deeper appreciation for the material. Another approach is through the use of video lectures and tutorials. By providing online video content, students can review lectures and difficult concepts at their own pace, and as many times as needed. This approach can also provide students with additional examples and demonstrations that may not have been covered in traditional lectures. Online quizzes and assignments are another approach that can be used in computer-aided teaching. By using online tools to provide immediate feedback and the ability to practice solving problems, students can reinforce their understanding of the material and develop confidence in their abilities. Additionally, instructors can use these tools to assess student understanding and adjust their teaching accordingly.

[1] AUTOMATIC CORRECTION OF MULTIPLE-CHOICE TESTS USING DIGITAL CAMERAS AND IMAGE PROCESSING

Automatic correction of multiple-choice tests using digital cameras and image processing is a process that uses computer vision technology to grade multiple-choice tests automatically. This approach eliminates the need for manual grading and reduces the time and effort required to grade large numbers of tests. The process works by taking pictures of the completed tests using digital cameras, and then using image processing algorithms to analyze the images and determine the answers selected by the test-taker. The

system compares the selected answers to the correct answers and assigns a score based on the accuracy of the responses.

[2] BLENDED E-ASSESSMENT: MIGRATING CLASSICAL EXAMS TO THE DIGITAL WORLD.

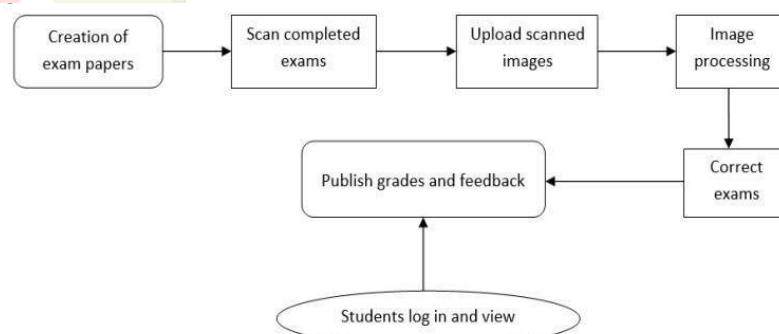
Blended e-assessment is the process of transitioning traditional paper-based exams to digital platforms, while also incorporating new modes of assessment that are only possible through digital means. This approach offers the benefits of both traditional exams and digital assessment, creating a more comprehensive and effective evaluation of student learning outcomes. One of the main benefits of blended e-assessment is its flexibility. Students can complete exams online, allowing them to take exams from any location and at any time. This reduces the need for proctoring and eliminates the constraints of traditional exams, such as time limits and designated locations.

[3] INTELLIGENT MATHEMATICS ASSESSMENT IN EMAX.

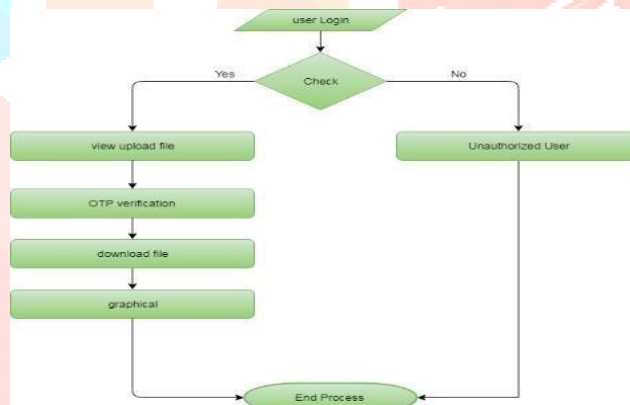
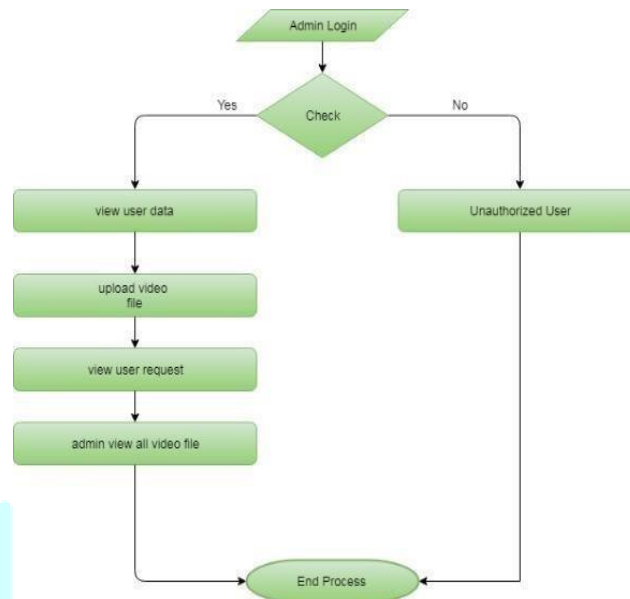
Intelligent mathematics assessment in EMAX (Educational Mathematics Assessment and XML) refers to a computer-based system that uses artificial intelligence (AI) to provide personalized assessments of students' mathematical knowledge and skills. The system is designed to be used in educational settings, such as schools or universities, and is intended to provide a more efficient and accurate way to assess student progress and provide feedback to instructors. The EMAX system uses AI algorithms to analyze student responses to a series of mathematical problems and then provides feedback based on the student's performance. The system can also adapt to the student's learning level, adjusting the difficulty of the questions based on their responses. This allows the system to provide a more personalized assessment of each student's mathematical abilities.

III. METHODOLOGY

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.

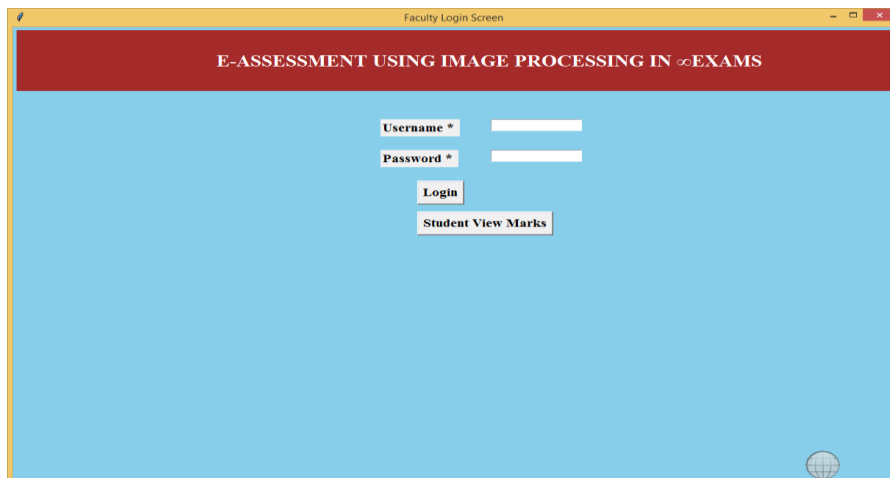


The Faculty will upload the students answer sheets as photos. Those photos can be evaluated with the help of Digital Image Processing technique. It can be achieved with the help of python's opencv library. The matrix form is created with answer key to identify and give the result as per the photos.

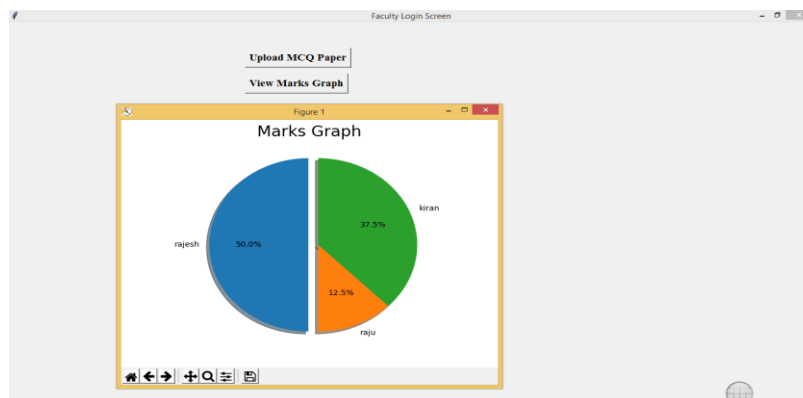
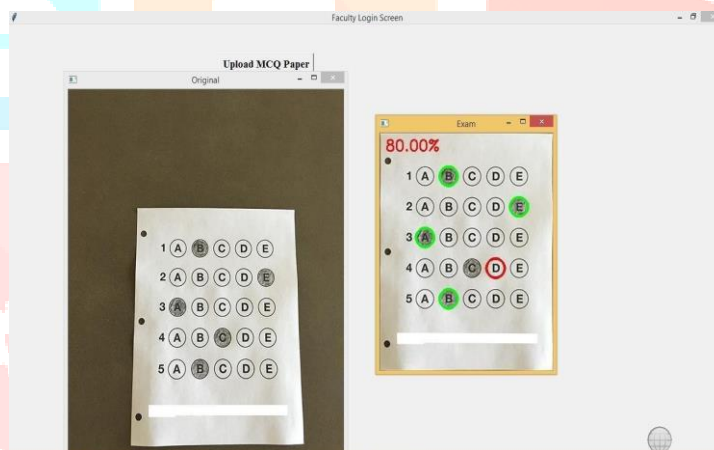


IV. RESULTS AND DISCUSSION

In above screen enter username as 'faculty' and password as 'faculty' to login and after login will get below screen



The resnet50 model accuracy with various epochs is as shown in the figure below.



V. 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 functionalities of the system have already been tested with more than a 100 exam sheets filled out by students solely for this purpose. The image processing part of the system has given satisfactory results as it seemed fast enough to process even a massive number of images at once without a single error. It is beyond doubt that the further development potential of the E- Exams software system is great and by seizing this opportunity, when it will be completed and released, it could play a considerable role in the future of the revolution of the digitalization of education.

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.

One promising area for future work is in developing adaptive e-assessment tools. Adaptive assessment systems use algorithms to adjust the difficulty of questions based on a student's performance. This can provide a more personalized and accurate assessment of a student's knowledge and skills. Another area for future work is in developing automated feedback systems. These systems can provide immediate feedback to students on their performance, identifying areas of strength and weakness, and providing suggestions for improvement. Automated feedback can save teachers time and improve student learning outcomes. Interactive simulations can provide a unique and engaging way for students to demonstrate their knowledge and skills. Future work in e-assessment could involve developing more interactive simulations that allow students to apply their knowledge and skills in a realistic and engaging way. Many schools and universities use learning management systems (LMS) to manage course materials and assessments. Future work in e-assessment could involve integrating assessment tools more seamlessly with LMS platforms, making it easier for teachers to create and manage assessments and for students to access and complete them. As e-assessment becomes more widespread, it is important to ensure that assessments are standardized and of high quality. Future work in e-assessment could involve developing guidelines and best practices.

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