AI BASED AUTOMATIC MARK ENTRY SYSTEM

R.Subasri*, R.Meenakumari*
*Professor, Kongu Engineering college, Perundurai, India

Abstract

An automatic mark entry system is a computer based system that automatically captures marks or grades from various sources and stores them in a database. The system is designed to automate the process of entering marks or grades for students, eliminating the need for manual entry, and reducing the chances of errors. OCR-based systems use image processing techniques to automatically recognize and extract marks or grades from scanned documents, such as exam answer sheets or report cards. By automating the process of entering marks or grades, teachers and administrators can focus on other important tasks, such as teaching and providing feedback to students. A webcam is used to capture the marks in answer sheets of all the students and the data is transferred into an Excel sheet automatically. Automatic mark entry systems not only save time and reduce errors but also provide real-time access to the data, allowing teachers and administrators to quickly analyze and evaluate the performance of students.

1 Introduction

Traditionally, marks or grades are entered manually by teachers or administrators, which can be a time-consuming process and may lead to errors. OCR-based systems use image processing techniques to automatically recognize and extract marks or grades from scanned documents, such as exam answer sheets or report cards. A webcam is used to capture the answer sheets of all the students who scored in the examination. The numbers are detected, and the data is transferred into an Excel sheet automatically. Generally this OCR technology is used in number plate recognition system. An accurate vehicle detection system for traffic control is recommended by many researchers. A system which recognises a vehicle's number plate from video using video processing and OCR technology was proposed [1] [3]. for storing the detected number plate of vehicles in a database. Further to overcome the drawback of inaccuracy in recognizing the number plates of high speed vehicles, an automatic vehicle recognition identification System using EasyOCR is recommended[2]. The validation of effectiveness of EasyOCR is also highlighted in comparison with Tesseract OCR for Automated License Plate Recognition Using Deep Learning Algorithm [4]

In this paper, EasyOCR is applied to recognize the hand written marks in the front page of answer sheets for individual questions and total and automatically creates an excel data sheet. The front page of answer sheet is printed with other details such as name of institution, name of students, course name, etc along with tabular column for entering marks of individual question. The image of the tabular column filled with marks is scanned and given as input to easyocr algorithm for automatic creation of data base. This system ensures 100% accuracy in mark entering process for data base creation to publish results in every educational institution.

The automatic mark entry system as shown in Fig 1 consists of a key algorithm namely EasyOCR. EasyOCR is used for the number recognition, a webcam is used for scanning the exam paper, the detected image is displayed, and the output is automatically converted into an Excel sheet for the data storage.

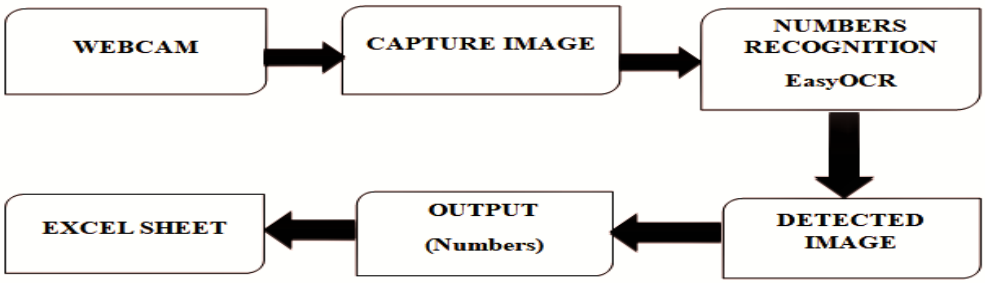


Fig 1 Block Diagram for the AI based automatic mark entry system

In order to recognize numbers using EasyOCR, the library uses a combination of machine learning and image processing techniques. The library is pre-trained on a large dataset of images containing various types of text, including numbers. During training, the library learns to identify the patterns and features that are characteristic of different types of text, and uses this knowledge to recognize text in new images. When recognizing numbers, EasyOCR first identifies regions of an image that contain text using image processing techniques. Once the text regions have been identified, EasyOCR applies its machine learning models to recognize the individual characters within the text regions. EasyOCR is designed to be able to recognize numbers in a wide range of formats, including handwritten numbers, numbers with unusual fonts or styles, and numbers that appear against complex backgrounds.

Detecting numbers in a webcam image involves using image processing techniques to identify and extract numerical characters from the image. The process can be broken down as initial step of image acquisition, where the image is captured using the webcam. The webcam captures the live video tream and sends it to the computer. Secondly , image preprocessing, in which the image is captured is be preprocessed to improve its quality and prepare it for analysis. This may involve operations like resizing, cropping, color correction, and noise reduction. Finally image segmentation will segment the image into regions of interest (ROIs) where numbers are likely to be located. This may involve identifying features such as edges or corners that indicate the presence of a number.Once the ROIs have been identified, the next step is to recognize the individual characters within them. This can be done using techniques like template matching, feature extraction, or machine learning algorithms. Finally, the recognized numbers can be outputted to a display or another application.

The identified numbers using the EasyOCR library are linked into an excel spreadsheet using a variety of programming languages and libraries. Here the popular option of the Pandas library in Python is used. After importing the necessary libraries in Python script, image is loaded using Open CV. The numbers alone are extracted using EasyOCR from the image and it displayed the result as a list of dictionaries, where each dictionary contains information about the recognized characters. the extracted numbers stored in a DataFrame created in Pandas and using the option of excel method, the data is displayed in excel sheet.

2 Performance Evaluation and Testing Results

After installation of necessary files and libraries, as a first step the user is asked to enter the course code and name and to give the number of students as in Fig 2. After completing the task, the mark sheet is kept of image capturing as in Fig 3

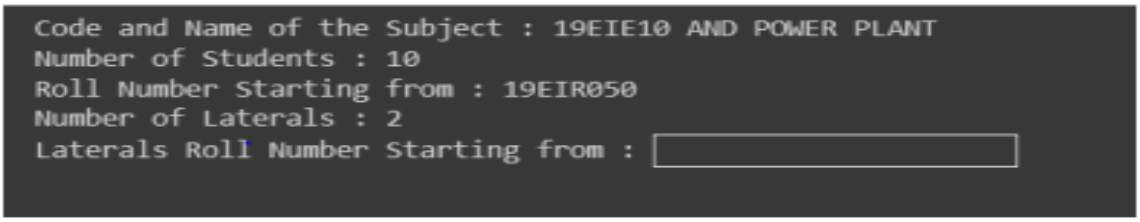


Fig 2. User Interface

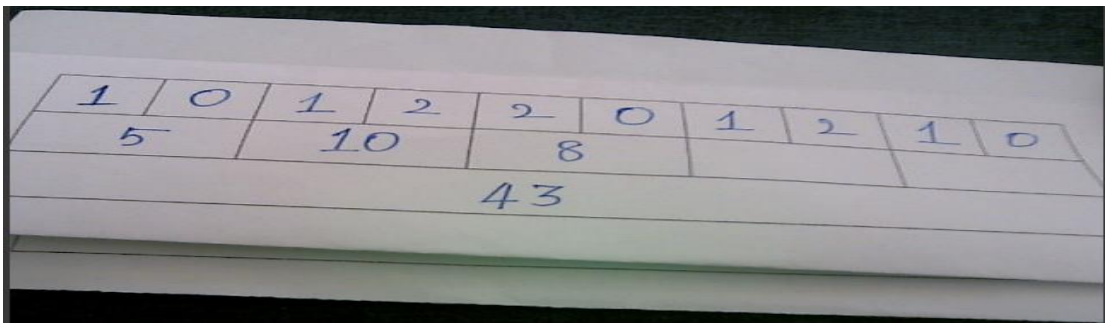
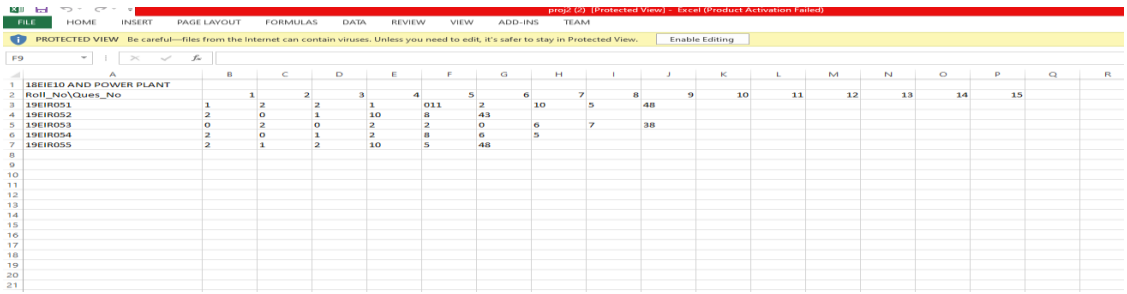


Fig 3 Input image of sample mark sheet

After capturing the image using webcam EasyOCR will detect and display the numbers and finally that outputs displayed are stored automatically in the Excel sheet as in Fig 4



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	18EIE10 AND POWER PLANT																	
2	Roll_NoVQues_No	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
3	19EIR051	1	2	2	1	011	2	10	5	48								
4	19EIR052	2	0	1	10	8	43											
5	19EIR053	0	2	0	2	2	0	6	7	38								
6	19EIR054	2	0	1	2	8	6	5										
7	19EIR055	2	1	2	10	5	48											

Fig 4 Excel sheet with marks

From the excel sheets, it is evident that the accuracy in transferring the marks entered in the grade sheets to excel is 100%. By automating the grading process, educators no longer need to spend a significant amount of time and effort manually grading exams, which can significantly reduce the workload and manpower required for grading.

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