

OMR SCANNER AND FORM READER

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Abstract

In this project we are developing a OMR Scanning software which is used to analyse the competitive exam question paper's answer sheet, admission forms etc.

Today we find that lot of competitive exams are been conducted as entrance exams. These exams consists of MCQs. The students have to fill the right box or circle for the appropriate answer to the respective questions. During the inspection or examining phase normally a stencil is provided to the examiner to determine the right answer to the questions. This is a manual process and a lot of errors can occur in the manual process such as counting mistake and many more. To avoid this mistakes OMR system is used. In this system OMR answer sheet will be scanned and the scanned image of the answer sheet will be given as input to the software system. Using Image processing we will find the answers marked to each of the questions by finding the region of interest and applying template matching algorithm. Summation of the marks & displaying of total marks will be also implemented.

1. Introduction:

In the past and presently, some OMR systems require special paper, special link and a special input reader (Bergeron, 1998). This restricts the types of questions that can be asked and does not allow for much variability when the form is being input. Progress in OMR now allows users to create and print their own forms and use a scanner (preferably with a document feeder) to read the information. The user is able to arrange questions in a format that suits their needs while still being able to easily input the data. OMR systems approach one hundred percent accuracy and only take 5 milliseconds on average to recognize marks. Users can use squares, circles, ellipses and hexagons for the mark zone. The software can then be set to recognize filled in bubbles, crosses or check marks.

OMR can also be used for personal use. There are all-in-one printers in the market that will print the photos the user selects by filling in the bubbles for size and paper selection on an index sheet that has been printed. Once the sheet has been filled in, the individual places the sheet on the scanner to be scanned and the printer will print the photos according to the marks that were indicated.

This system also used for other applications also by making small changes in form design and software code. The proposed system can be implemented by using camera instead of scanner by adjusting values of Rmin and Rmax. Besides the achievements in terms of accuracy and reliability of the proposed system, In Case of using scanner another advantage of this approach is that nontransoptic answer sheet paper with lower cost can be used. After capturing image it will be given as input to the software system and applying image processing like image segmentation ,image preprocessing, feature extraction and decision rule on the image and determine the result.

2. Literature survey:

This paper is actually an application that we are developing which enables implementation of OMR using an ordinary scanner. It provides tools to the user to design an OMR sheet based on the layout they want. The design of the sheet will be stored as image file format. Then user can take as many print outs as required, distribute it among others from whom information is desired, and get the filled sheets scanned. The scanned image files will then be provided as input to the software, processing will be done, value of filled fields will be extracted and then the data will be manipulated as instructed by the user. The implementation is done using Java[1].

The main objective of this paper is to develop a system which facilitates the OMR answer sheet evaluation technique which must be feasible and efficient. The objective is to eliminate the use of dedicated hardware which in turns very costly ,So the evaluation of OMR answer sheet could be done by the simple scanned image of that sheet using simple Scanner[2].

Student responses to a multiple choice exam, or responses to a questionnaire or feedback form after which the questions are provided on paper, and students mark their responses onto special pre-printed forms. Basically, the main task is to detect the presence and absence of dark marks and extract the information depending upon these marks from an image. There are number of softwares and hardwares in present market that are professionally used to detect such images. But however, here the aim is to develop a suitable software that would detect marks and hence prepare their results according to the needs[3].

One of the most important usages of OMR is checking multiple choices question exam students choose the answer by filling square choice on a printed paper. Then after scanning , these papers will be checked by special software automatically. This article is written based on morphology and rejection error algorithm which is included: scanning, preprocess, steps, basic identify, checked steps, and conclusion of different tests[4].

In this paper, a low-cost OMR (LCOMR) technique is presented. Besides implementing all the functions of the traditional OMR, LCOMR supports plain sheets (70 gsm or less) and low printing quality sheets. which include the image scan, tilt correction, scanning error correction, regional deformation correction and mark recognition, are presented[5].

3. Method Used:

It works on the principle of identifying the darker tone on the sheet & then differentiating it from the lighter tone (blank space) on the sheet. The answers to the questions or the required data is stored in the excel sheet.then the answers are varified from this sheet and final score is generated.

It has three module:

Module A : OMR Answer Sheet Checker

Module B : OMR Form Reader

Module C : Question Paper Generator

The OMR answer sheet checker is not only used for reading the answer sheets but also for checking the answers and calculating the scores received by the students. The software has the feature of generating various forms of reports which include mark lists, graphical reports, tabular reports, etc.This software is also used to read OMR elements (test ID, roll no., set no., etc.) that are integral part of the test processes.The software processes the OMR sheets at a high speed (3 sheets in a second). Also, the speed does not hamper the results in any way. We guarantee 100% accurate results.

The main job of the OMR form reader is collecting data from the OMR forms or sheets. It helps to collect information from admission forms, feedback forms, questionnaires, application forms, etc. printed on OMR sheets. It has the ability to read different types of OMR blocks and transfer the information into any desired output like Excel sheet. A thing that makes it different from module A of the OMR software is that it cannot evaluate the data or information provided by the OMR sheets.

The sole purpose of the question paper generator is to help users to generate question papers with ease. You have to create blueprint for the question paper by mentioning the subject, topic, number of questions and such other things.

4. Features:

4.1 Design and layouts features.

- Create your own OMR sheet design.
- No dependency over paper size.
- No special paper required to print OMR.

4.2 Scan and read features:

- Use any normal scanner.
- Read all types of OMR sheets.
- Unlimited no.of sets.
- Reread faulty files.
- Data sorting.
- Column validation.

4.3 OMR storage:

- Barcodes identification of forms.
OMR marks and barcodes are read and moved directly into a database management system(eg. SQL)then to census database.
- Images are not normally scanned and stored.

4.4 OMR Accuracy:

- To achieve high accuracy well structured design and good quality printing of these forms is critical.

5. Challenges & limitations:

There are also some disadvantages and limitations to OMR. If the user wants to gather large amounts of text, then OMR complicates the data collection. There is also the possibility of missing data in the scanning process, and incorrectly or unnumbered pages can lead to their being scanned in the wrong order. Also, unless safeguards are in place, a page could be rescanned, providing duplicate data and skewing the data.

a)The entire process must be tested.

- Information capture.
- Recognizing
- Verifying result.

b)Questionnaire design and preparation is critical.

- Forms must be readable.

6. Conclusion:

Ultimately any technology introduced should serve the purpose of well being of common community. Optical mark recognition (OMR) is a data capture technology used for automated data entry into a computer system. It is gaining wide acceptance in educational institutes for computer aided assessment. The two methods used for OMR are using dedicated scanner and using image. The problems associated with first method are it is costly and customization of forms is difficult. The second method of OMR i.e OMR from image is simple to design and implement,requires less

hardware and forms can be customized by users. For computer aided assessment it is best suited because the form design can be customized by user. The system is developed to meet the following goals: The system is used for computer aided assessment of class tests. The system is designed and implemented with minimum cost.

References:

- [1] Garima Krishna, Hemant Ram Rana, Ishu Madan, Kashif, Narendra Sahu, "Implementation of OMR Technology with the Help of Ordinary Scanner", International Journal of Advanced Research in Computer Science and Software Engineering, April 2013.
- [2] Tanvi Sharma and Prof. Niket Bhargava, "OMR (Optical Mark Recognition with Simple Scanner)", Journal of Advances in Computational Research: An International Journal, January-December, 2012.
- [3] Surbhi Gupta, Geetila Singla, and Parvinder Singh Sandhu, "A Generalized Approach To Optical Mark Recognition", International Conference on Computer and Communication Technologies (ICCCCT'2012) May 26-27, 2012 Phuket.
- [4] Houbakht Attaran, Fatemeh Sarani Rad, Shideh Nessari Ashkezari, Marzieh Rezazadeh, "Checking multiple choice question exams, International symposium on advances in science and technology 2013.
- [5] Hui Deng, Feng Wang, Bo Liang, "A Low-Cost OMR Solution for Educational Applications", International Symposium on Parallel and Distributed Processing with Applications, 2008.
- [6] https://en.wikipedia.org/wiki/Optical_mark_recognition
- [7] www.omrhome.com/
- [8] Kia O E (1997) Optical Mark Recognition-FAQ. <http://tev.itc.it/people/modena/kia-ocr-faq.htm>
- [9] K. Chinnasarn Y. Rangsanseri "An imageprocessing oriented optical mark reader" Applications of digital image processing XXII, Denver CO, 1999.
- [10] Stephen Hussmann, Leona Chan, C.Fung, M. Albrecht, "Low Cost and high speed Optical mark reader based on Intelligent line Camera", Proceedings of the SPIE AeroSense 2003, optical pattern recognition XIV, Orlando, Florida, USA, vol. 5106, 2003. p. 200-08