

DEPARTMENT OF COMPUTER APPLICATIONS  
20MCA246 – MAIN PROJECT

PRO FORMA FOR THE APPROVAL OF THE FOURTH SEMESTER MAIN PROJECT

(Note: All entries of the pro forma for approval should be filled up with appropriate and complete information. Incomplete Pro forma of approval in any respect will be rejected.)

Main Project Proposal No : 1\_\_\_\_  
(Filled by the Department)

Academic Year : 2021- 22

Year of Admission : 2020

1. Title of the Project : OMR GRADING APPLICATION USING OPENCV-PYTHON
2. Name of the Guide : Mr. Vasudevan T V
3. Student Details (in BLOCK LETTERS)

Name

Register Number

Signature

BHAVIJITH V

MES20MCA-2014



Date:

**Approval Status :** Approved / Not Approved

Signature of  
Committee Members }

**Comments of the Guide**

**Dated Signature**

Initial Submission :

First Review :

Second Review :

**Comments of the Project Coordinator**

**Dated Signature**

Initial Submission:

First Review

Second Review

Final Comments :

## OMR GRADING APPLICATION USING OPENCV-PYTHON

BHAVIJITH V

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### Introduction:

The main objective of this project is to develop an Image processing based Optical Mark Recognition sheet scanning application. In today's world a whole lot many entrance exams are held as competitive exams which comprise MCQs. The students in such exams have to fill the right boxes or circles for correct answers. Usually a stencil is given to the examiner to evaluate the correct answers to the questions while the examining phase. But this manual process can lead to a lot of errors such as counting mistakes. To make sure that this is avoided, an OMR sheet is used which is to be scanned and this scanned image of the answer sheet is taken in by the software system. Open-CV, which is a free open-source software application that helps computer programmers for developing software, that has a simple interface which is systematic, (& well-organized technology is used, depending on the scanner used). Thousands of OMR sheets per day can be checked with the combination of these tools.

### Objectives:

#### Existing System:

The conventional testing/grading system has a number of disadvantages. Starting from the reception of exam papers from the students to their manual correction by a scrutinizer to updating their marks in a score sheet manually, there are high chances that the marks might get changed or miscounted. Also, as the manual corrections can't be trusted as the scrutinizers could be biased or could be moody sometimes. So there's no guarantee that the students get their original marks all time. And over all these, a lot of time would be wasted for this routine.

#### Disadvantages:

1. Counting/ Observation Errors while counting the marks
2. Parallax Errors while rounding and entering those marks
3. Other Random Errors
4. Time consumption

#### Proposed System:

Here OMR Scanning is done, too using Computer Vision. So it doesn't involve any human interference, hence it can be trusted. Here each and everything happens automatically, on the click of a button. So here the application uses Open-CV which is a library/ package that's tested under different conditions and proven fit to operate over a large scale of intensities, capture-angles, and noise.

#### Advantages:

1. Automatic counting of marks
2. No Random Errors
3. Very less Operating-time, as there's no need of correcting, checking, and entering marks
4. Highly efficient, and zero errors
5. Automatic updates to (and from) database(s)

### Problem Definition:

In today's world a whole lot many entrance exams are held as competitive exams which comprise MCQs. The students in such exams have to fill the right boxes or circles for correct answers. Usually a stencil is given to the examiner to evaluate the correct answers to the questions while the examining phase. But this manual process can lead to a lot of errors such as counting mistakes. To make sure that this is avoided, an OMR sheet is used which is to be scanned and this scanned image of the answer sheet is taken in by the software system. Open-CV, which is a free open-source software application that helps computer programmers for developing software, that has a simple interface which is systematic, (& well-organized technology is used, depending on the scanner used).

Thousands of OMR sheets per day can be checked with the combination of these tools. Structured Query Language (SQL, which is a special programming language used to create & manage data efficiently in database management systems) is used. Further, Open Source Computer Vision Library (Open-CV) is an open source library/package that has been developed using machine learning software tools. Visual Studio Code is an integrated development environment (IDE) from Microsoft technologies which is used to create extraordinary computer programs for Microsoft Windows, websites' enhancements, web applications' development and other web services. Open-CV (Open Source Computer Vision) is a free-to-use function library that is primarily focused at vision for computers which is real-time; this library is a cross-platform and a multi-pattern program, which supports robust, agile and indispensable object oriented programming which is highly functional. So, we use all the above software in designing the OMR (Optical Mark Recognition) which plays a key role in the integrity of the smooth functioning of correction of marked questionnaires. Thus, it's a very simple & low cost proposed system used with a scanner to decode answers from OMR test sheets over the traditional expensive OMR (Optical Mark Reader) system. This system is agile, coherent, & has a prodigious methodology of evaluation.

## **Basic functionalities:**

### **Tools / Platform, Hardware and Software Requirements:**

#### **Hardware specification:**

The selection of hardware is very important in the existence and proper working of any software. Then selection hardware, the size and capacity requirements are also important.

- Processor : Intel Pentium Core i5 and above
- Primary Memory : 4 GB RAM and above
- Storage : 500 GB hard disk and above
- Display : VGA Colour Monitor
- Key Board : Windows compatible
- Mouse : Windows compatible

#### **Software specification:**

One of the most difficult tasks is selecting software for the system, once the system requirements is found out then we have to determine whether a particular software package fits for those system requirements.

#### **The application requirements:**

- Front end : Python
- Framework: OpenCV
- Operating system : windows 7 and above
- IDE : PyCharm

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