

AI – POWERED GPA / CGPA CALCULATOR FOR ANNA UNIVERSITY

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Manual GPA/CGPA calculation methods are time-consuming and prone to human error, particularly when processing multiple subjects and credit structures. This paper presents an OCR-based automated GPA/CGPA calculation system designed to simplify and standardize the evaluation process. The proposed system extracts subject details, grades, and credit information directly from uploaded mark sheet images using Optical Character Recognition (OCR) techniques.

The extracted textual data is preprocessed to remove noise and converted into a structured format suitable for computation. This structured data is then processed by a dedicated computation module to accurately calculate credit-weighted GPA and cumulative CGPA in accordance with university regulations. The system ensures consistency and minimizes discrepancies commonly found in manual calculations.

The prototype is implemented using Python-based frameworks and deployed through a user-friendly interface that allows easy upload and instant result generation. Experimental validation demonstrates improved processing speed, reduced manual errors, and reliable GPA computation compared to traditional methods. The proposed approach provides a scalable, efficient, and practical solution for automated academic result processing in educational institutions.

Keywords— *Optical Character Recognition, GPA/CGPA Calculation, Academic Analytics, Automated Evaluation.*

INTRODUCTION

Grade Point Average (GPA) and Cumulative Grade Point Average (CGPA) are fundamental indicators of academic performance in higher education institutions. However, existing GPA calculation methods primarily rely on manual data entry or spreadsheet-based tools, which are time-consuming and prone to human error. These methods also become inefficient when handling multiple subjects and complex credit structures, leading to inconsistencies in results.

To address these limitations, this paper proposes an OCR-based automated GPA/CGPA calculation system. The system utilizes Optical Character Recognition (OCR) to extract subject details, grades, and credit information directly from uploaded mark sheet images. The extracted data is preprocessed and converted into a structured format to ensure accuracy and consistency. This structured data is then processed to compute regulation-based credit-weighted GPA and CGPA efficiently.

The proposed approach minimizes manual intervention, improves computational accuracy, and provides a reliable solution for automated academic result processing.

EXISTING SYSTEM

Current GPA/CGPA calculation methods primarily depend on manual computation, calculator-based evaluation, or spreadsheet tools such as Excel. In these approaches, students are required to manually enter subject grades and credit values, which increases

the probability of data entry errors and miscalculations. Additionally, these systems are time-consuming and require repeated effort for each semester update.

PROPOSED SYSTEM

The proposed system is an OCR-based automated GPA/CGPA calculation platform designed to eliminate manual data entry and improve computational accuracy. The system allows users to select regulation, department, and semester before uploading a mark sheet image. Optical Character Recognition (OCR) is applied to extract subject names, grades, and credit values from the uploaded image and convert the unstructured text into structured academic data.

Using the extracted data, the system computes credit-weighted GPA and CGPA according to university regulations. The proposed solution improves accuracy, reduces processing time, and provides a reliable alternative to traditional manual GPA calculation methods.

SYSTEM ARCHITECTURE AND BLOCK DIAGRAM

The proposed system follows a modular architecture consisting of four major components: User Interface, OCR Module, CGPA Computation Module, and Database. The User Interface provides an interactive platform where users can select relevant academic parameters such as regulation, department, and semester, and upload mark sheet images through a web-based application.

The OCR module processes the uploaded image to extract subject names, grades, and credit values. Image preprocessing techniques such as noise reduction, resizing, and text enhancement are applied to improve recognition accuracy. The extracted unstructured text is then parsed and converted into a well-organized structured format suitable for further processing.

The structured data is subsequently validated and processed by the CGPA computation module to accurately calculate credit-weighted GPA and cumulative CGPA in accordance with university regulations. The module ensures consistency in calculation by applying standardized grading rules and handling missing or incorrect data effectively.

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Block Diagram

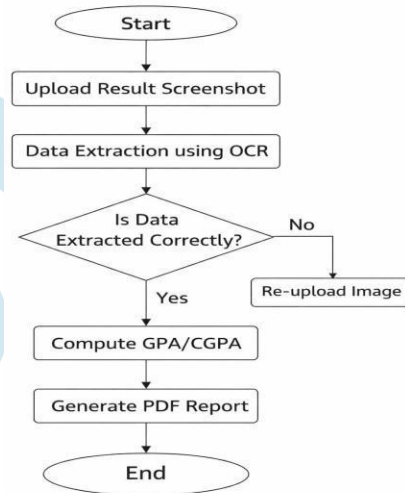


Figure 1. Block Diagram

METHODOLOGY

The proposed system follows a sequential processing approach for automated GPA/CGPA calculation. Initially, the user selects the regulation, department, and semester through the web interface and uploads the mark sheet image. The uploaded image undergoes preprocessing steps such as noise reduction, grayscale conversion, and resolution enhancement to improve the accuracy of text extraction.

Optical Character Recognition (OCR) techniques are then applied to extract subject names, grades, and credit values from the processed image. The extracted text is further refined using parsing and validation techniques to remove irrelevant characters and ensure correct identification of academic fields. The cleaned data is organized into a structured format suitable for computation.

The structured data is then processed by the CGPA computation module, where grade-to-point mapping is performed based on predefined university grading regulations. The system also includes validation mechanisms to handle missing or inconsistent data, ensuring reliable and accurate results.

The structured data is then processed by the CGPA computation module, where grade-to-point mapping is performed based on predefined university grading regulations. Each subject's grade point is multiplied by its corresponding credit value to compute weighted grade points, forming the basis for GPA calculation.

SOFTWARE IMPLEMENTATION

1. User Interface Implementation

The user interface is developed as a web-based platform to provide interactive and user-friendly access to the system. It allows users to select key academic parameters such as regulation, department, and semester through dropdown menus before uploading the mark sheet image. This structured input approach minimizes user errors and ensures consistency in data entry. The interface also supports seamless image upload and displays computed GPA/CGPA results clearly to the user.

2. OCR Processing Implementation

The OCR module is responsible for extracting academic details from uploaded mark sheet images. The input image undergoes preprocessing steps such as grayscale conversion, noise reduction, and image enhancement to improve text recognition accuracy. The processed image is then passed to the Tesseract OCR engine for text extraction.

The extracted raw text is further cleaned and parsed to identify relevant fields such as subject codes, grades, and credit values. Unnecessary characters and inconsistencies are removed during this stage. The refined data is then organized into a structured format, which serves as input for the CGPA computation module.

3. CGPA Computation Implementation

The CGPA computation module processes the structured academic data obtained from the OCR module. A predefined grade-to-point mapping system is implemented in accordance with university regulations. Each subject's grade point is multiplied by its corresponding credit value to compute weighted grade points.

Semester GPA is calculated by dividing the total weighted grade points by the total number of credits. The cumulative CGPA is computed by aggregating the performance across multiple semesters using credit-weighted averaging. Validation checks are incorporated to handle missing or incorrect data and to ensure computational accuracy and consistency.

Additional validation checks are incorporated to handle missing, duplicate, or inconsistent data entries, thereby improving reliability. The module also ensures precision in calculations through standardized formulas, resulting in accurate and consistent GPA/CGPA outputs aligned with academic regulations.

RESULTS AND DISCUSSION

The proposed OCR-based GPA/CGPA calculation system was tested using multiple sample mark sheet images from different semesters and academic formats. The OCR module successfully extracted subject codes, grades, and credit information with high recognition accuracy under clear image conditions. Minor variations in image quality slightly affected extraction performance; however, preprocessing techniques such as noise reduction and image enhancement improved overall reliability.

The computed GPA and CGPA results were cross-verified with manual calculations to evaluate correctness. The system produced consistent and accurate results based on credit-weighted grade point formulas, effectively eliminating manual computational errors.

Compared to traditional spreadsheet-based methods, the automated system significantly reduced processing time and minimized user intervention. Overall, the system demonstrates improved efficiency, accuracy, and reliability, making it a practical solution for automated academic result processing.

FUTURE WORK

The proposed system can be further enhanced by improving OCR robustness to handle low-resolution images, varied lighting conditions, and different mark sheet formats across universities. Advanced deep learning-based text recognition models can be integrated to improve extraction accuracy and adaptability to complex document layouts.

The machine learning module can be extended beyond regression analysis to include predictive modeling techniques such as classification or neural networks for more accurate academic performance forecasting. Integration with institutional databases or ERP systems can enable real-time academic tracking.

Additionally, incorporating data visualization dashboards, multi-semester record management, and mobile application support would enhance accessibility and usability across different user platforms. Integration with cloud-based storage and secure user authentication can further improve data availability and protection. These enhancements would make the system more scalable and adaptable for broader institutional use, enabling efficient academic record management beyond basic GPA/CGPA computation.

CONCLUSION

This paper presented an OCR-based automated GPA/CGPA calculation and academic performance analysis system designed to eliminate manual data entry and computational errors. The system integrates Optical Character Recognition for extracting subject details from mark sheet images, credit-weighted GPA/CGPA computation based on university regulations, and regression-based machine learning for performance trend analysis.

Experimental evaluation demonstrates that the proposed system improves efficiency, reduces processing time, and ensures accurate academic result computation when compared to traditional manual methods. In addition to numerical evaluation, the system provides subject-wise performance insights and personalized recommendations, enabling data-driven academic planning. The proposed solution offers a scalable and intelligent approach to modern academic performance assessment.

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