Automated Grading and Feedback System for Assignments

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Abstract

This proposal outlines a research project aimed at developing an Automated Grading and Feedback System for assignments. We provide motivation for the project, define the problem we aim to address, propose initial thoughts on models/algorithms, discuss potential datasets, outline how we will measure success, and describe possible analyses that can be conducted throughout the project.

1 Introduction

Grading assignments in college departments can be a labor-intensive and time-consuming task for instructors. The proposed Automated Grading and Feedback System aims to address this issue by automating the grading process, thereby reducing grading time and providing students with immediate feedback on their assignments. This system leverages Document AI techniques and will be powered by the Hewlett Foundation AES Dataset.

2 Motivation

The motivation behind this project stems from the need to enhance the learning experience for students and reduce the burden on instructors within our college department. Manual grading often leads to delayed feedback, which can hinder students' progress and cause anxiety. By automating the grading process, we can provide students with rapid and constructive feedback, ultimately improving their learning outcomes.

3 Problem Statement

The primary problem to address is the inefficiency and time consumption of manual assignment grading. Students often experience anxiety while waiting for their assignments to be graded, affecting their overall learning experience. The proposed system aims to provide a solution by automating the grading process using the Hewlett Foundation AES Dataset, enabling students to receive rapid feedback and improving instructors' workflow.

4 Model/Algorithm to Address Problem

The system will consist of several key components:

4.1 Data Collection

The primary dataset for this project is the Hewlett Foundation AES Dataset. This dataset includes essays written by students and their corresponding scores, making it ideal for training and testing the automated grading and feedback generation components of our system.

4.2 Text Extraction and Analysis

Optical Character Recognition (OCR) and text extraction techniques will be implemented to convert scanned or image-based assignments into machine-readable text.

4.3 Automated Grading

A grading model will be developed using supervised learning techniques, using the Hewlett Foundation AES Dataset where essays are manually graded.

4.4 Feedback Generation

The system will generate detailed feedback for students based on the grading model's assessment, using scoring information from the Hewlett Foundation AES Dataset. Feedback will include comments, suggestions for improvement, and grades.

4.5 Plagiarism Detection

Algorithms for plagiarism detection will be implemented using the Hewlett Foundation AES Dataset to identify potential instances of academic dishonesty in student assignments.

5 Datasets

The primary dataset for this project is the Hewlett Foundation AES Dataset.

6 Measurement of Success

The success of this project will be measured based on a set of key performance metrics relevant to the problem:

- **Accuracy of Automated Grading:** We will assess the accuracy of the automated grading model by comparing its grades to the ground truth grades provided in the Hewlett Foundation AES Dataset. This evaluation will include metrics such as accuracy, precision, recall, and the F1 score, providing a comprehensive understanding of the grading model's performance.
- **Quality and Helpful Feedback:** The generated feedback's quality and helpfulness will be evaluated through qualitative analysis by both students and instructors. Additionally, we may employ natural language processing metrics, including BLEU, ROUGE, and readability scores, to quantify the quality of the feedback.
- **Effectiveness of Plagiarism Detection:** Plagiarism detection algorithms will be assessed for their effectiveness in identifying potential instances of academic dishonesty. Metrics such as true positive rate, false positive rate, and the F1 score will be used to evaluate the performance of the plagiarism detection module.

These metrics will provide a comprehensive assessment of the system's performance in automating grading, feedback generation, and plagiarism detection, ensuring that the project meets its objectives effectively.

7 Possible Analysis

Throughout the project, various analyses will be conducted to:

- Evaluate the accuracy and reliability of the automated grading model using the Hewlett Foundation AES Dataset.
- Assess the quality and relevance of the generated feedback based on scoring information from the Hewlett Foundation AES Dataset.
- Measure the system's effectiveness in detecting plagiarism using the Hewlett Foundation AES Dataset.

8 Conclusion

This project aims to revolutionize the assignment grading process within our college department by introducing an automated grading and feedback system powered by the Hewlett Foundation AES Dataset. By providing rapid and accurate grading, constructive feedback, and plagiarism detection, this system will enhance the learning experience for students and reduce the workload on instructors.

9 References

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