FORCASTING ACDMIC PERFORMANCE IN COMPUTER SCIENCE STUDENTS BASEDON FUTURE ANALYSIS METHOD

Mr N.KISHORE KUMAR¹, LINGINENI BHAVANA KRANTHI², BINABOINA GNANA HARSHITHA³, BELLAM HARI KRISHNA⁴, NALAMOLU VENKATA KRISHNAMUTHI²

¹Department of CSE & AI, Chalapathi Institute Of Engineering And Technology, LAM, Guntur, Andhra Pradesh, India.
²Department of CSE & AI, Chalapathi Institute Of Engineering And Technology, LAM, Guntur, Andhra Pradesh, India.
³Department of CSE & AI, Chalapathi Institute Of Engineering And Technology, LAM, Guntur, Andhra Pradesh, India.
⁴Department of CSE & AI, Chalapathi Institute Of Engineering And Technology, LAM, Guntur, Andhra Pradesh, India.

Abstract: The ever increasing importance of education has driven researchers and educators to seek innovative methods for enhancing student performance and understanding the factors that contribute to academic success. This paper presents a methodology for predicting CGPA SGPA that leverages machine learning techniques to forecast students academic achievements based on a variety of features, such as demographic information, academic history, and behavioral patterns. The proposed student academic performance method utilizes a real-world collected dataset from multiple educational institutions to ensure an accurate and comprehensive analysis. The proposed methodology starts with a data preparation stage, where the data is cleansed and organized for analysis. This process encompasses tasks such as handling missing values, scaling the data, and transforming variables if necessary. The feature analysis technique was used to select the most important features for the students academic performance model. A number of machine learning classifiers were tested, and the feature analysis was found to be the best performer. The results of this study demonstrate the potential of algorithms in predicting student performance and identifying key factors that influence academic success. This information can be leveraged by educators and academic institutions to develop targeted intervention strategies, tailored learning experiences, and personalized recommendations for students, ultimately fostering a more effective learning environment and improving overall educational outcomes.

Keywords: Student Performance, Student Performance Prediction, Academic Performance, Prediction System, Student Profiles, Higher Academic Performance, feature analysis.

1. INTRODUCTION

In the current age of big data and advanced computing, machine learning (ML) has rapidly gained traction in various fields due to its potent predictive and analytic capabilities. The educational sector is no exception, with recent years witnessing the integration of ML into diverse educational processes. One emerging application of this technology is the prediction of student performance metrics, such as CGPA SGPA, leveraging historical academic records and diverse data points. This research paper presents a study on predicting student semester CGPA SGPA using machine learning algorithms. The primary objective of this study is to build a predictive model for student academic performance, specifically semester CGPA SGPA, using a broad range of student data. Such data encompasses demographic information, previous academic records, attendance, behavioral patterns, and other pertinent data. The model predicted individual student CGPA SGPA, providing valuable insights into students who may need additional support or those who are likely to excel.

This predictive endeavor proactively identifies student’s at risk of underperformance or failure, enabling educators and administrators to intervene promptly and efficiently. This predictive model empowers stakeholders to make informed, data-driven decisions regarding additional support and resources to ensure students success [4,5]. The proposed system, termed the semester CGPA SGPA prediction system, leverages a suite of supervised machine learning algorithms, including support vector machine (SVM), linear regression, and Gradient Boosted (GB). These algorithms form the foundation of our predictive models, built on a comprehensive dataset collated from multiple educational institutions. The dataset represents various student backgrounds and academic disciplines, ensuring the model's general applicability and robustness.

To enhance the performance of the machine learning models, several feature selection and data pre-processing techniques were employed. These include testing datasets for null value, data encoding for non-numeric features, and data normalization methods, which streamline the input data and enable the feature analysis algorithms to uncover predictive patterns.

2. LITERATURE REVIEW

An automated assessment machine has been proposed to assess scholar overall performance and to investigate the scholar achievement. Here the writer makes use of tree set of rules for predicting scholar overall performance accurately. In the proposed machine Education Data Mining (EDM) is used for the type. Clustering facts mining
method is used for studying the huge set of scholar database. This method will accelerate the looking technique and
the additionally yield the type end result extra accurately[1].

M.Ramaswami and R.Bhaskaran have used CHAID prediction version to investigate the interrelation among variables
which can be used to are expecting the final results of the overall performance at better secondary faculty schooling.
The functions like medium of instruction, marks received in secondary schooling, place of faculty, dwelling region
and form of secondary schooling had been the most powerful signs for the scholar overall performance in better
secondary schooling. The CHAID prediction version of scholar overall performance turned into built with seven
magnificence predictor. [2]

3. SYSTEM ANALYSIS
3.1 EXISTING SYSTEM

For your project on predicting student performance using machine learning techniques, the existing system or related
work could involve a review of prior research, existing models, or traditional methods used in education to assess and
predict student performance. You might discuss the limitations of these existing systems and highlight the gap in the
literature that your proposed methodology aims to address.

Consider adding a brief section at the beginning of your paper that introduces the current challenges in predicting
student performance, the methods or systems traditionally employed, and the need for more accurate and innovative
approaches. This will provide context for readers and emphasize the significance of your proposed methodology in
advancing the field.

LIMITATIONS OF EXISTING SYSTEM

- **Lack of Personalization**: Many existing systems lack personalized approaches to student performance
  prediction. They may use generalized models that do not consider individual learning preferences and
  variations, resulting in less accurate predictions for specific student populations.

- **Limited Integration of Behavioural Data**: Existing systems often underutilize behavioural data in
  predicting student performance. Factors such as attendance, engagement in extracurricular activities, or study
  habits are not always integrated into predictive models. Neglecting these behavioural aspects can lead to an
  incomplete understanding of student performance.

3.2 PROPOSED SYSTEM

The proposed system aims to address several limitations inherent in existing approaches to predicting student
performance. Leveraging advanced machine learning techniques, our system introduces a more comprehensive and
personalized methodology. Unlike traditional systems that rely heavily on academic metrics, our approach considers a
broader range of factors, including demographic information, academic history, and behavioural patterns. By
employing the Recursive Feature Elimination (RFE) technique, we ensure the selection of the most relevant features
for the predictive model, thus enhancing accuracy.

One key innovation of our system lies in its ability to adapt to dynamic changes in a student's academic journey. By
incorporating real-time data and adopting the linear regression algorithm as the primary classifier, our system
demonstrates a greater capacity to capture sudden shifts in behaviour or personal circumstances. Furthermore, the
inclusion of behavioural data, such as attendance and engagement in extracurricular activities, contributes to a more
holistic understanding of student performance.

The personalized nature of our methodology addresses the limitations of existing systems that often lack
individualization. Recognizing that different students have distinct learning preferences and needs, our system strives
to provide tailored predictions, fostering a more accurate representation of academic outcomes. By doing so, we aim
to offer educators and academic institutions a valuable tool for developing targeted intervention strategies,
personalized learning experiences, and recommendations, ultimately contributing to a more effective and equitable
learning environment.
4. SYSTEM ARCHITECTURE

5. MODULES

User: User module facilitates user interactions, handling input, authentication, and personalized experiences, ensuring smooth navigation and seamless engagement within the system.

- Server: The server provides data storage service and can also do the following operations such as View Users, View All Stored Data, View Charts.

- Output Module: The output module takes the output from the classification module and presents it in a user-friendly format. This module may include a graphical user interface (GUI) that displays the Graphs.

- Evaluation: Evaluation of the system involves assessing its effectiveness, accuracy, and user satisfaction through testing, feedback collection, and performance analysis to ensure optimal functionality and meet user expectations.

6. RESULT

Fig 6.1: Shows personal information and statistic analysis of student CGPA, SPGA

7. CONCLUSION: We propose an automatic age (biological) and gender estimation system for the promising smart store enterprise which is a modern venture in the retail industry. This automated system can extract the human demographics necessary to provide the customer a very good shopping experience that results in a boost of offline smart store sales. In addition, this enterprise solution can ease the shopping process and shorten the shopping time for the consumers. Although recent methods show their potentials for the problem of age and gender estimation, the best works focused on constrained image benchmarks. As a result, these methods are not robust enough for the application involving real-world images. Most recently, some of the researchers learned to apply their model utilizing unconstrained image datasets, but these models are biased for the early and middle adulthood classes due to image sparsity problems in the dataset.

FUTURE SCOPE: While the future scope is promising, it's important to navigate challenges such as data privacy, ethical use of AI, and the potential for algorithmic bias. Ensuring transparency, fairness, and inclusivity in AI and ML applications is crucial to their success in enhancing educational outcomes.
REFERENCES


