International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 07 Issue: 11 | November - 2023 SJIF Rating: 8.176 ISSN: 2582-3930

COLLEGE PREDICTION SYSTEM

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Abstract - The journey towards higher education is a pivotal chapter in a student's life, often marked by uncertainty and high stakes. In the context of engineering admissions in Maharashtra, where over 400 colleges are governed by the Directorate of Technical Education (DTE), the process can be labyrinthine. The Centralised Admission Process (CAP) involving multiple rounds further amplifies the complexity, leaving students perplexed about selecting the ideal college for their academic aspirations. The College Admission Prediction System is an innovative web application designed to address these challenges and bring clarity to the admission process. Leveraging the power of machine learning, the system employs the Adaboost algorithm and data analysis techniques to empower students with accurate and data-driven insights. By considering factors like rank, state domicile, category, preferred branches, preferred districts, and preferred colleges, the system generates a preference list based on a thorough analysis of three years' historical cutoff data. This prediction model is a valuable tool, enabling students to make well-informed decisions prior to seat allotment in both the first and second CAP rounds. The project is driven by a vision to alleviate the stress and insecurity associated with college admissions. By offering students transparent and reliable predictions, it transforms the admission process into a more navigable and data-guided journey. The College Admission Prediction System not only benefits students by aiding in college selection but also supports educational institutions in optimising seat allocation. This project signifies a significant step towards data-driven decision-making in the education sector and promises to enhance the overall experience of students pursuing engineering education in Maharashtra.

Keywords: Admission, prediction model, adaboost algorithm, data analysis.

1.INTRODUCTION

The pursuit of higher education is a pivotal juncture in the lives of students, laden with dreams, aspirations, and a desire for excellence. In the state of Maharashtra, where more than 400 engineering colleges beckon aspiring minds, the journey toward securing a coveted seat in these institutions is riddled with complexities. The Directorate of Technical Education (DTE) governs the admission process, orchestrating the Centralised Admission Process (CAP), a multifaceted and often bewildering system. Amidst the abundance of choices and the intricacies of the admission rounds, students frequently find themselves in a state of flux, grappling with uncertainties, and striving to discern the ideal college for their academic odyssey. In response to this quandary, we introduce the College Admission Prediction System, a revolutionary web application that aims to usher in a new era of transparency, data-driven decision-making, and relief from the tumultuous admissions journey. At its core, the system harnesses the power of machine learning, particularly the Adaboost algorithm and sophisticated data analysis techniques, to empower students with accurate and comprehensive insights. By considering a multitude of factors including academic rank, state domicile, category, preferred branches of study, districts of preference, and favoured colleges, the system generates a tailored preference list. This list is not merely a compilation of choices but a precise and informed selection, meticulously crafted through a rigorous analysis of three years' worth of historical cutoff data. The College Admission Prediction System is not just a technological marvel; it embodies a vision that aspires to alleviate the immense stress and insecurity that often accompany the quest for quality education. It strives to metamorphose the admission process into a more transparent, structured, and navigable voyage for students. Beyond serving as a guiding beacon for students, this project extends its benevolence to the educational institutions, aiding them in the efficient allocation of seats. In essence, this initiative signifies a profound step towards data-driven decision-making in the education sector, promising a brighter and more assured future for students embarking on the pursuit of engineering education in Maharashtra. In this project, we embark on a transformative journey, where technology and education converge to empower the aspiring engineers of tomorrow, offering them clarity, confidence, and the promise of a brighter future.

2. LITERATURE SURVEY

[1] Zhenru Wang, Yijie Shi, "Prediction of the Admission Lines of College Entrance Examination based on Machine Learning", 2nd IEEE International Conference on Computer and Communications, 2016, pp. 332- 335.

The first research paper introduces an innovative approach to forecasting college student performance. This study employs an AdaBoost ensemble as its primary methodology, emphasizing its application to real-world scenarios. The AdaBoost ensemble, composed of decision trees, is trained on a comprehensive dataset that includes an array of student attributes. These attributes encompass academic metrics such as grade point averages (GPA), standardized test scores, along with demographic data, location categories, and Common Entrance Test (CET) scores.

The research findings from this paper are particularly striking. The AdaBoost ensemble demonstrates exceptional predictive accuracy, achieving an impressive 92.5% accuracy rate.

[2] Abdul Hamid M. Ragab, Abdul Fatah S. Mashat, Ahmed M. Khedra, "Hybrid Recommender System for Predicting College Admission", 12th International Conference on Intelligent Systems Design and Applications (ISDA), 2012, pp. 107-113.

The second research paper introduces an innovative hybrid recommender system tailored for the prediction of college admission outcomes. This hybrid system uniquely combines AdaBoost with an array of other machine learning algorithms, including decision trees, support vector machines, and naive Bayes classifiers. The model also thoughtfully integrates additional features, most notably location categories and CET scores, into the prediction process.

The research results from this paper are no less than remarkable. The hybrid AdaBoost model consistently outperforms other college prediction systems, boasting an accuracy rate of 94.3%. This study unequivocally emphasizes the essential role of incorporating location categories and CET scores as pivotal factors in elevating the accuracy and precision of predictive models, further establishing the necessity of these features.

[3] Vandit Manish Jain1, Rihaan Satia, "College Admission Prediction using Ensemble Machine Learning Models"

The third research paper discusses the development of an Education Predictor System to help students in choosing the right university for their higher education. The purpose of the system is to assist students who may lack resources and prior knowledge in making informed decisions about which universities to apply to. The system uses machine learning algorithms such as linear regression, random forest, neural networks, and decision trees to predict the chances of admission based on various parameters such as GRE scores, TOEFL scores, university ranking, statement of purpose, letter of recommendation, undergraduate GPA, and research experience. The paper also highlights the importance of applying to universities that align with the candidate's chances of acceptance to reduce costs and increase the likelihood of admission. Overall, the paper aims to provide a solution to the problem of choosing the right university by utilizing machine learning algorithms and accurate prediction models.

[4] Mr. Sachin Bhoite, Prof. Dr. Ajit More, "Engineering & technology admission analysis and prediction", GEDRAG & ORGANISATIE REVIEW - ISSN:0921-5077

The fourth paper discusses the analysis and prediction of engineering and technology admissions. The goal is to determine the factors that influence students' selection of engineering colleges for their first-year admission. The researchers aim to guide students in selecting the right college and provide predictions on their admissibility to desired colleges.

To achieve this objective, the researchers have built a predictive model using machine learning techniques. They have used various algorithms such as Logistic Regression, K Nearest Neighbors, Decision Tree Classifier, Random Forest Classifier, Naive Bayes, and Support Vector Machine classifiers. These algorithms are trained on input features such as Merit Marks, Candidate Type, Category, Home University, PH Type, Defense Type, HSC Eligibility, and BRANCH.

The performance of these classifiers is evaluated using cross-validation techniques, both with and without feature engineering. The results show that Random Forest and Decision Tree classifiers provide better accuracy compared to other algorithms.

Overall, the analysis and prediction of engineering and technology admissions aim to assist students in making informed decisions about college selection and increase their chances of getting admitted to the desired institutions.

3. METHODOLOGY AND WORKING

The College Admission Prediction System employs a multi-faceted methodology that combines machine learning algorithms, data analysis, and user-driven preferences to provide accurate admission predictions. The following steps outline the methodology:

1.Historical admission data is collected from various educational institutions in Maharashtra. This data includes information about cutoff scores, seat allotments, and admission trends over the past three years.

2.The collected data is preprocessed to clean and structure it for analysis. This involves handling missing values, outliers, and data normalization.

3. Relevant features, such as academic rank, state domicile, category, preferred branches, districts of preference, and

preferred colleges, are selected as input variables for the prediction model.
4.The Adaboost algorithm is chosen as the core machine learning model for prediction. Adaboost is an ensemble learning technique that combines multiple weak classifiers to create a strong classifier. It is known for its high accuracy and adaptability to various data types.
5.The selected machine learning model is trained using the preprocessed historical admission data. It learns to predict the likelihood of admission to different colleges based on the chosen input features.
6. Students provide their user profiles, including academic information and preferences, via the web application's user interface.
7. The system processes the user-provided data and uses the trained Adaboost model to generate admission predictions for a list of colleges, ordered by the likelihood of admission.
8.The predictions are displayed on the user interface, where students can view the probability of admission to various colleges, helping them make informed choices.

Working of the System
The College Admission Prediction System operates in a user-friendly and intuitive manner, aiming to simplify the complex admission process:

1.Students create accounts on the system by providing their basic information. They can log in to access the prediction features.
2. After logging in, students input their academic details, including JEE score, JEE rank, MHCET score, MHCET rank, category, state domicile, and preferred branches of study. They also specify their preferences for districts and colleges.
3.The system processes the user-provided data, combining it with historical admission data and input features for analysis.
4.Using the Adaboost machine learning model, the system generates predictions based on the user's profile and preferences. It calculates the likelihood of admission to various colleges.
5.The predictions are presented to the user via the web application's interface. The colleges are listed in order of the probability of admission, enabling students to make informed decisions.
6.Students can interact with the predictions, select desired colleges, and explore various scenarios based on their preferences.
7.The system may collect user feedback to improve its accuracy and user experience. It can also be updated with the latest historical admission data for ongoing accuracy.

The College Admission Prediction System simplifies the intricate admission process, offering students the power of data-driven decision-making. By combining historical admission data with user preferences and machine learning, the system equips students with accurate predictions, making their journey towards higher education a more informed and confident one.

3. CONCLUSION

In conclusion, the College Admission Prediction System represents a pioneering endeavor in the realm of higher education admissions. This project, driven by the fusion of technology and education, has the potential to alleviate the myriad complexities and uncertainties that students face when navigating the path to engineering colleges in Maharashtra. By leveraging the robust Adaboost algorithm, machine learning, and historical data analysis, the system empowers students with data-driven insights that were once elusive. It transforms the admission process into a structured and transparent journey, where decisions are made with confidence and clarity.

The impact of the College Admission Prediction System extends not only to students but also to the educational institutions, streamlining seat allocation and resource management. This project stands as a testament to the power of technology in reshaping traditional processes and enhancing user experiences. It is a testament to the possibilities that arise when data-driven decision-making meets the fervor of aspirants.

As we conclude this endeavor, we look forward to a future where students embark on their academic journeys with unwavering confidence, equipped with the knowledge and assurance they need to fulfill their dreams. The College Admission Prediction System signifies not just a technological innovation, but a beacon of hope for students, a catalyst for educational institutions, and a testament to the transformative power of innovation in the realm of education.

4. FUTURE SCOPE

In the future, the College Admission Prediction System can expand its capabilities by integrating real-time admission data, which will ensure predictions remain up-to-date and precise. Advanced machine learning models can be explored and implemented to enhance prediction accuracy. Additionally, the system can be extended to mobile platforms, broadening its accessibility. Beyond college admissions, there's potential for predictive analytics to encompass career prospects based on selected engineering branches. Collaboration with official admission portals and adaptation for international use can further enhance the system's reach. Implementing machine learning explainability will offer transparency, and user customization will allow personalization. Continuous improvements in data security, as well as a robust user feedback loop for system enhancement, are essential aspects of the future development of this project.

5. REFERENCES

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