# COLLEGE PREDICTION SYSTEM

**Mr. Nishant Raut [1], Mr. Shivam Raina [2], Ms. Bhakti Patare [3], Ms. Shital Shirole[4], Prof. P.S Raikar[5]**

**1.2.3.4.Last Year Student, Department of Computer Engineering, Smt. Kashibai Navale College of Engineering, Pune, Maharashtra, India*

**5Profecessor, Department of Computer Engineering, Smt. Kashibai Navale College of Engineering, Pune, Maharashtra, India*

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**Abstract** –
The project overview discusses the challenges students face in college selection during admissions and introduces an innovative solution through a sophisticated application. By employing machine learning and data analysis, this application generates personalized preference lists based on academic rank, preferred branches, and historical cut-off data. Utilizing modern technologies like React.js and Django, it aims to improve user experience and decision accuracy. Ultimately, it addresses the need for informed college choices, mitigating post-admission disillusionment and frustration for students.

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

## 1.INTRODUCTION

The exploration delves into the development and implementation of the "College Prediction System," a pioneering application aimed at revolutionizing the college admission process for aspiring engineering students in Maharashtra. In today's educational landscape, students encounter numerous challenges when crafting preference lists for colleges, navigating uncertainties, and facing the complexities of admission criteria. The system seeks to address these challenges by harnessing machine learning algorithms, advanced data analysis techniques, and modern web development technologies. Through personalized and data-driven guidance, the system assists students in selecting colleges aligned with their preferences and academic profiles. Key to its functionality is a sophisticated algorithm that leverages historical admission data to predict outcomes with precision. Developed using React.js, Tailwind CSS, Django, and Django REST Framework, the system offers a user-friendly interface and scalable infrastructure. By empowering students with informed decision-making tools, the "College Prediction System" aims to mitigate post-admission regrets and increase educational opportunities in Maharashtra's Centralized Admission Process framework.

## 2. LITERATURE SURVEY

**[1] A Robust Performance Degradation Modeling Approach Based on Student's t-HMM and Nuisance Attribute Projection Huiming Jiang 1 , Jing Yuan 1 , Qian Zhao 1 , Han Yan 2 , Sen Wang3 , And Yunfei Shao**

This paper proposes a robust modeling approach based on Student's t-hidden Markov model (Student's t-HMM) and nuisance attribute projection (NAP). The results demonstrate the robustness and effectiveness of the proposed approach for PDA

**[2] A Review: Predicting Student Success at Various Levels of their Learning Journey in a Science Programme. Judith Goodness Khanyisa Mabunda, Ashwini Jadhav, Ritesh Ajoodha**

This paper examines how features affect student persistence or dropout at South African higher education institutions, based on three previous studies. In the previous studies, high school grades were used as a valid predictor of student success.

**[3]Application of Fuzzy logic for performance evaluation of academic students Seyyed Hossein Jafari Petrudi , Maryam Pirouz, Behzad Pirouz**

This study proposes a new performance evaluation method based on fuzzy logic systems. With using fuzzy logic based on Mamdani technique we get a new approach for evaluating students.

**[4]Academic Success Prediction based on Important Student Data Selected via Multi-objective Evolutionary Computation**
**Nobuhiko Kondo, Takeshi Matsuda, Yuji Hayashi, Hideya Matsukawa**

The case study reported in this paper analyzes and proposes a possible and practicable ranking strategy of only selected factors via Dempster Shafer theory of evidence and fuzzy relational calculus.

**[5]"Institute Recommendation System Using ML". Asmita Orse, Nikhil Suryawanshi, Harsh Shrivastav, Pratik Bajpai, Prof. Megha Patil**

In this system, techniques such as collaborative filtering, content based filtering, hybrid

recommendations, knowledge based recommendations, demographic recommendations are used to build the module.

# 3. METHODOLOGY

### 3.1Requirement Analysis-

The College Admission Prediction System is designed for accessibility, reliability, and security. Users can access it from various devices with web browsers, interacting with a web-based interface deployed on Vercel. Backend processes run on a powerful server hosted on Render, while data storage is managed by a PostgreSQL database on Railway. Integration of React ensures a responsive front-end, while Django handles robust back-end operations. Machine learning algorithms, like linear regression, provide personalized insights. Security measures include encryption protocols and strict access controls to protect user data. Overall, the system aims to empower students with informed decisions while prioritizing data security and privacy.

### 3.2 Implementation-

The successful implementation of the College Admission Prediction System is contingent on various critical factors. Firstly, the system relies heavily on the availability and accuracy of historical admission data sourced from educational institutions and government bodies. This data forms the backbone of the predictive models, necessitating meticulous curation and regular updates to maintain relevance and precision. Secondly, the effectiveness of machine learning models, notably algorithms like Adaboost, is paramount. Continuous fine-tuning, updates, and maintenance by machine learning experts are essential to ensure the accuracy and reliability of the predictions generated by the system. Moreover, the choice and management of the technology stack, comprising frameworks like React for the front-end and Django for the back-end, are central to the system's development. This involves managing dependencies on libraries and third-party tools, ensuring they remain up-to-date and compatible. Quality assurance of user input is another critical aspect, requiring mechanisms to validate and authenticate academic data and preferences entered by students. Compliance with legal and privacy regulations, overseen by legal and privacy experts, is indispensable to safeguard user data and adapt to evolving regulatory frameworks. Additionally, the system's stability hinges on secure and resilient server infrastructure provided by hosting services, necessitating regular maintenance, backups, and scalability measures. Collaborative partnerships with educational institutions are vital for accessing and updating admission data, requiring well-defined data sharing agreements and prompt data updates. Lastly, continuous monitoring and maintenance efforts, spearheaded by system administrators and technology experts, ensure optimal performance, security, and reliability of the system throughout its operational lifespan.

### 3.3 Testing-

During the testing phase of our project, several critical test cases were executed to ensure the system's functionality and reliability. These tests covered various aspects such as user authentication, data input, access control, and result retrieval. Each test case followed a structured approach, including description, steps, expected results, and actual outcomes, resulting in a pass or fail status. For instance, tests ensured successful user login and signup processes, proper redirection to login pages, and the ability to access designated pages. Validation checks were conducted for percentile inputs, and functionalities like admin login, CSV file creation, and result download were verified. All tests passed successfully, indicating the system's robustness and adherence to requirements. These test cases collectively validate the College Admission Prediction System's functionality, security, and user experience, contributing to its overall reliability and effectiveness.

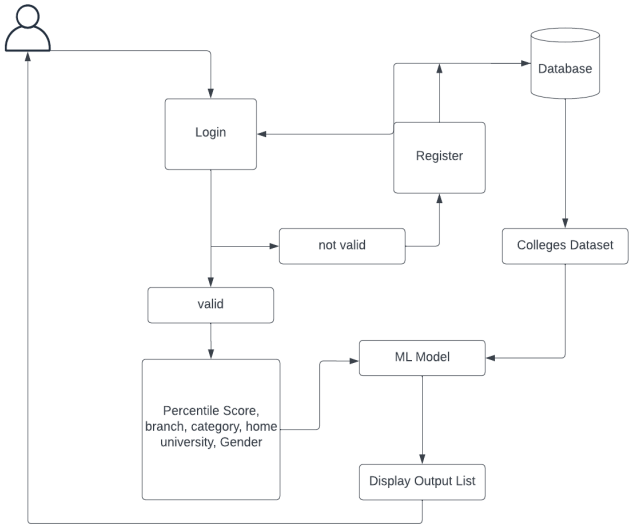
### 3.4Deployment-

The deployment strategy for the project is finely tuned, utilizing four distinct components to manage different aspects of deployment. Vercel handles frontend deployment, offering features like automatic Git-based deployments and scalability. Render manages backend deployment, simplifying infrastructure management with its automatic scaling capabilities. Railways streamlines database deployment with features such as automatic backups and easy integration. AWS S3 serves as the storage solution for CSV file datasets, ensuring secure and scalable storage. Together, these platforms create a seamless and efficient deployment workflow, enabling the project to scale and perform reliably.

### 3.5 Maintenance-

Maintenance of the project involves a crucial task wherein the admin must manually create and update datasets for each cap round. This process is essential to ensure that the datasets used for analysis and model training remain up-to-date and accurately reflect the latest information. Failing to update these datasets can lead to inaccurate results and compromise the overall accuracy of the model. Therefore, the admin plays a pivotal role in ensuring the integrity of the data used by the system. Implementing a systematic approach to dataset creation and updating, such as setting up reminders or automated processes, can help streamline this maintenance task and minimize the risk of oversight. Additionally, regular monitoring and validation of the datasets are essential to verify their accuracy and reliability, thereby upholding the integrity of the model and ensuring its effectiveness in delivering accurate results.

## 4. MODELING AND ANALYSIS



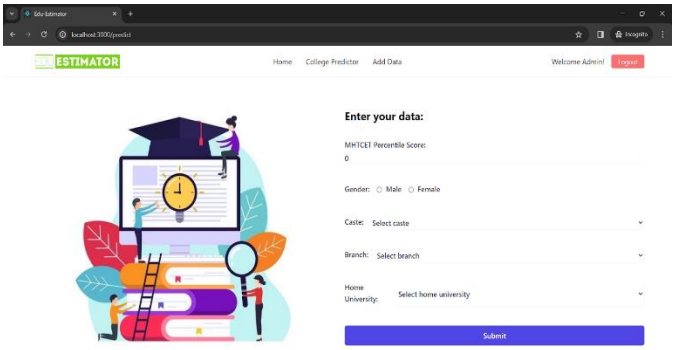

**Admin**
In this module, the admin has to log in by using a valid user name and password. After login successfully he can do some operations, such as View All Users and add or update new datasets in the project.

**End User**
In this module, the user must log in with their credentials. the user has to register using fresh credentials if they haven't already. After logging in, the user may access the prediction page, where they can input their gender, home university, caste or category, and percentile score. They can then view the results in the form of a list of universities.

## 3. PROJECT WORKING

**Input Data Retrieval:**

Users provide input data, including their MHT CET Percentile Score, Gender, Caste, Branch, and Home University, through the designated form fields.
The system retrieves relevant historical data and machine learning models necessary for predicting college cutoff scores based on the user's input.

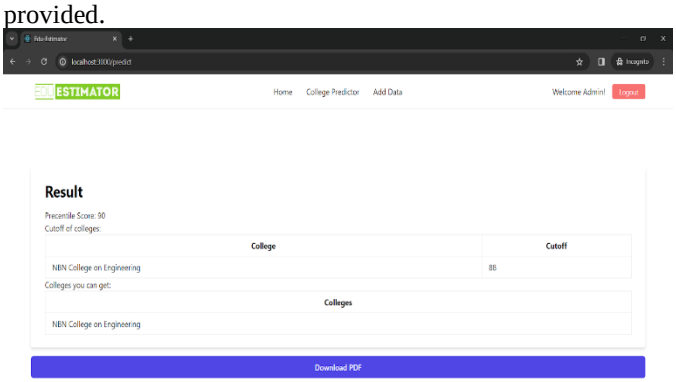



**Prediction Calculation:**

Machine learning algorithms, such as Linear Regression, analyse the input data and historical patterns to predict the cutoff scores of colleges.
Predictions are made based on various factors, including the user's academic performance, demographics, and preferences.

**Result Generation:**

The system generates a comprehensive prediction report, including the user's percentile score, predicted cutoff scores of colleges, and a list of colleges where the user is likely to get admission.
Predicted results are presented in a user-friendly format, allowing users to easily interpret and act upon the information provided.

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