

Campus Vision AI: An Smart College Prediction and Counselling System

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Abstract:

The college admission process is often challenging for students due to the large amount of cutoff data, multiple admission categories, and lack of proper guidance during counseling. Students usually analyze previous year cutoff lists to estimate their chances of admission, but manual analysis can be difficult and inaccurate. This paper presents Campus Vision AI, an intelligent college admission prediction and counseling system developed using machine learning techniques. The system analyzes historical admission cutoff datasets and predicts the probability of admission into different colleges and branches based on student marks, category, and previous admission trends. A Random Forest machine learning algorithm is used to train the prediction model and generate reliable admission predictions. The system also integrates an AI-based counseling assistant that helps students understand their admission possibilities and generate optimized college preference lists. By combining machine learning and intelligent counseling support, the proposed system simplifies the admission decision process and provides data-driven guidance to students during the college counseling process.

Keywords — Machine Learning, Admission Prediction, Random Forest, Artificial Intelligence, Education Analytics.

I. INTRODUCTION

The college admission process has become more complex due to the large number of colleges, courses, and admission categories available to students. Students often face difficulty in selecting suitable colleges based on their marks and category. Most students rely on previous year cutoff lists to estimate

their chances of admission. However, analyzing this data manually can be confusing and time-consuming.

With the advancement of technology, Machine Learning has become an effective tool for analyzing large datasets and identifying patterns. Machine learning algorithms can analyze historical admission data and provide predictions about admission possibilities.

This paper presents Campus Vision AI, an intelligent college admission prediction system developed using machine learning techniques. The system analyzes historical cutoff datasets and predicts admission chances based on student marks and category.

The proposed system uses the Random Forest algorithm to train the prediction model using past admission data. The system also includes an AI-based counseling assistant that helps students understand their admission possibilities and generate suitable college preference lists.

This approach simplifies the admission decision process and provides accurate, data-driven guidance for students during the counseling process

II. SCOPE OF THE PROJECT

The scope of the Campus Vision AI application is to analyze historical admission cutoff data and predict college admission possibilities using machine learning.

1. Current Scope

- Analysis of historical college admission cutoff datasets
- Prediction of admission chances based on student marks and category
- Implementation of a Random Forest machine learning model for prediction
- Generation of suitable college and branch suggestions
- Development of a user-friendly web interface for student interaction

2. Future Scope

- Integration with real-time admission counseling data
- Development of a mobile application for wider accessibility
- Implementation of advanced machine learning models for higher accuracy
- Personalized college recommendation system based on student preferences

The system can be further extended to support intelligent educational guidance platforms and automated admission counseling systems.

III. SYSTEM ARCHITECTURE

The Campus Vision AI system follows a modular architecture consisting of the following components:

1. User Interface Layer

- Developed using a web-based interface
- Allows students to enter marks, category, and course preferences
- Displays admission predictions and college suggestions

2. Data Processing Layer

- Handles dataset cleaning and preprocessing
- Converts raw admission cutoff data into structured format
- Prepares data for machine learning model training

3. Prediction Module

- Implements the Random Forest machine learning algorithm
- Analyzes historical cutoff datasets
- Predicts admission possibilities for colleges and branches

4. Counseling and Recommendation Module

- Generates suitable college and branch suggestions
- Assists students in creating optimized college preference lists
- Provides basic admission guidance

5. Dataset Layer

- Contains historical admission cutoff datasets
- Includes data for FE Engineering, DSE Engineering, and Pharmacy admissions

Working Flow

User Input → Data Processing → Machine Learning Prediction → College Recommendation → Output Display

- College name
- Branch
- Category
- Cutoff marks

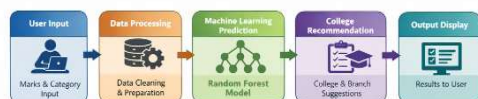


Fig. 1: System Architecture of Campus Vision AI Application

Fig 1: The system architecture of Campus Vision AI shows how user input is processed using historical cutoff data and a Random Forest model to predict admission possibilities and display college recommendations.

IV. METHODOLOGY

The Campus Vision AI system is developed using the following methodology:

1. Data Collection

Admission cutoff datasets are collected from available sources containing information such as college name, branch, category, and cutoff marks.

2. Data Pre-processing

The collected data is cleaned by:

- Removing missing values
- Eliminating duplicate records
- Formatting the dataset for analysis

3. Feature Selection

Important features affecting admission prediction are selected, such as:

4. Model Development

A Random Forest machine learning algorithm is used to predict admission possibilities. The model is trained using historical admission cutoff data and evaluated for prediction accuracy.

5. System Implementation

- Backend is developed using Python
- Machine learning models are implemented using Scikit-learn
- A web-based interface is used for user interaction

6. Testing and Evaluation

The system is tested using sample student inputs to evaluate prediction accuracy, performance, and usability.

V. CONCLUSION

The Campus Vision AI application provides an effective solution for assisting students in the college admission process using machine learning techniques. It helps students analyze admission possibilities by using historical cutoff datasets and predicting suitable colleges and branches

The system is simple, user-friendly, and capable of generating reliable admission predictions based on available data. Although the current system uses historical admission datasets, it can be further improved by integrating real-time admission data and advanced machine learning models.

Overall, Campus Vision AI has strong potential as an intelligent admission guidance system and can support students in making better decisions during the college counseling process.

REFERENCES

- [1] Aurélien Géron, Hands-On Machine Learning with Scikit-Learn, Keras and TensorFlow, O'Reilly Media, 2019.
- [2] Python Software Foundation, Python Documentation, 2025.
- [3] Pedregosa et al., Scikit-learn: Machine Learning in Python, Journal of Machine Learning Research, 2011.
- [4] State Common Entrance Test Cell, Maharashtra, CET Admission Cutoff Dataset, Government of Maharashtra, 2024.
- [5] Ian Goodfellow et al., Deep Learning, MIT Press, 2016.
- [6] J. Han, M. Kamber, Data Mining: Concepts and Techniques, Morgan Kaufmann, 2011.