LITERATURE SURVEY

1. **COLLEGE ADMISSION PREDICTION USING ENSEMBLE MACHINE LEARNING MODELS [VANDIT MANISH JAIN, RIHAAN SATIA, DECEMBER 2021]**

This paper aims to build a model that can help students to pick the right universities based on their profiles. So they can judge across a wide variety of domains that include MS (international), M.Tech (India) and MBA (India and International). For the accurate predictions we plan on training a machine learning model in order to provide results. The dataset contains information on the student profile and the university details with a field detailing if the admission was positive or not. Various algorithms have been used i.e. Ensemble Machine Learning and the predictions have been compared using key performance indicators(KPIs). The model performing the best is then used to evaluate the dependent variable i.e. The chances of admit to a university. The chances of admit variable is a variable ranging from 0 to 1 which equates to the predicted probability of successful acceptance to a university. We also aim to create a portal which filters and then provides a list of universities that fall into the profile's acceptance range.

This is a project with good future scope, especially for students of our age group who want to pursue their higher education in their dream college. The graphs illustrate the chances of getting an admit against the predicted chances of getting an admit using different algorithms. Comparison in each of these models is done by evaluating Key Performance Indicators (KPI). With the help of this, it provides a cleaner output and helps in comparing the indicators like Root Mean Square Error, Mean Square Error, Mean Absolute Error and Adjusted R-Squared of an algorithm. At times accuracy provides ambiguous results if there are unequal observations or multiple classes are present in the dataset. Results show us that the highest accuracy is achieved through the linear regression model and the decision tree has the lowest accuracy

2. AN AUTOMATED PREDICTION MODEL FOR COLLEGE ADMISSION SYSTEM [DR. ARUNAKUMARI B. N, VISHNU SASTRY H K, SHEETAL NEERAJ, SHASHIDHAR R, JUNE 2021]

At present, many students make mistakes in their preference list of colleges because of various reasons like inaccurate analysis of colleges, lack of knowledge, and apprehensive prediction. Later, they end up regretting the same after allotment. This application addresses this issue of the student admission community. The application uses data mining and data analysis techniques. Rank, category, preferred branches, preferred district, and preferred colleges are taken as input and the preference list, on thorough analysis of the last five years' cut-off data is generated. In this paper, an attempt has been made to develop an automated web application prediction model for a college admission system which can be used to make a wise choice of college before allotment.

A candidate will obtain a rough idea regarding the seat he or she is likely to get depending on his or her rank and category. Cut-off will be different for each college, course, and category. The row headings consist of college names along with branches. The column headings consist of the various categories. The data contained in the database is of string data type. Each cell (corresponding to a branch and college i.e., row heading and category i.e., column heading) in the database, consists of the rank that a candidate belonging to a particular category has to secure in order to get admission into that particular branch and college.

The web application helps the user make wise choice of colleges for his/her option-entry. Also, the user gets an outline/rough idea of the entries they can make in the option-entry process provided by examination authority. The same application can be used for Common Entrance Tests of other states and for other national level entrance exams by only changing the cut-off database of that exam. Proposed application benefits for the student admission community that accommodates the need of students to choose the best college and helps colleges too to recognize their stand in attracting students and finer prediction implies better results for the students.

3. GRADUATE ADMISSION PREDICTION USING MACHINE LEARNING [SARA ALJASMI, ALI BOU NASSIF, ISMAIL SHAHIN, ASHRAF ELNAGAR, OCTOBER 2020]

This paper addresses machine learning models to predict the chance of a student to be admitted to a master's program. This will assist students to know in advance if they have a chance to get accepted. The machine learning models are multiple linear regression, k-nearest neighbour, random forest, and Multilayer Perceptron. Experiments show that the Multilayer Perceptron model surpasses other models.

The dataset presented in this paper is related to educational domain. Admission is a dataset with 500 rows that contains 7 different independent variables which are Graduate Record Exam (GRE) score, Test of English as a Foreigner Language (TOEFL) score, University Rating, Statement of purpose (SOP), Letter of Recommendation Strength (LOR), Undergraduate GPA (CGPA) and Research Experience.

In this paper, machine learning models were performed to predict the opportunity of a student to get admitted to a master's program. The machine learning models included are multiple linear regression, k-nearest neighbour, random forest, and Multilayer Perceptron. Experiments show that the Multilayer Perceptron model surpasses other models.

4. GRADUATE ADMISSION CHANCE PREDICTION USING DEEP NEURAL NETWORK [MD. OMAER FARUQ GONI, MD. ABU ISMAIL SIDDIQUE, ABDUL MATIN, OISHI JYOTI, TONMOY HASAN, FAHIM MD SIFNATUL HASNAIN, SEPTEMBER 2020]

In this study, they have proposed a deep neural network (DNN) to predict the chance of getting admitted to a university according to the student portfolio. All the selection criteria are considered here to predict the chance of admission. The DNN model has been compared with existing methods in terms of different performance metrics including mean squared error (MSE), root mean squared error (RMSE), mean absolute error (MAE), R-squared score. It has shown the most promising result that includes R-squared score of 0.8538 and MSE of 0.0031. The proposed method has also outperformed all the existing methods in each benchmark.

In this study, the graduate admission dataset has been split into training dataset and testing dataset. Data normalization has been performed to accelerate the training process of the DNN model. Using the training dataset, the DNN model has been trained with optimal hyper parameter. It has been assessed through some standard bench markings. The outcomes of the DNN model have also been compared with the existing methods. Normalization technique is proposed which is used to transform all the numeric features into a common scale without deforming and losing information. Without normalization these varieties of range can create problems in the learning process of machine learning (ML) algorithms.

DNN is an artificial neural network (ANN) which is inspired by biological neurons. Each biological neuron is approximately connected with other 10000 neurons where the connection is established through dendrite and synapse. A neuron receives signal through dendrite and sends to the next connected neuron through synapse when it is electrically excited. When the hidden layer of an ANN contains multiple layers it is called DNN. The optimization process is performed through the back-propagation method where error of the output layer is transferred back to the input layer. By optimizing weights, error is reduced.

This DNN model shows an optimistic outcome in every benchmark and has also outperformed the existing methods. It has been successfully experimented that a DNN model can identify complex data patterns more accurately than other ML methods. According to statistical analysis, it can be said that the proposed method is more accurate, beneficial and efficient that will save both the time and resources. Moreover, it will help a student to get admitted to his/her dream university.

5. ENGINEERING & TECHNOLOGY ADMISSION ANALYSIS AND PREDICTION [MR. SACHIN BHOITE, PROF. DR. AJIT MORE, FEBRUARY 2020]

The aim of this paper is to determine the factors estimating & guiding the students to select engineering college for their first year admission. Most of students & parents are spending unnecessary efforts, time & money on selecting right engineering college for first year admission. Sometimes the students who are seeking admission is not eligible to take admission into engineering program based on their past academic record. Also sometimes the students are seeking the admission to the college for she or he are not eligible as per the merit of that college. So here researcher has built predictive model to guide the students about their admissibility in the desired college & also suggest the college where they will get the admission. So to achieve this objective we may include machine learning capabilities that allow to improve their performance based on experience, just as humans do. As right College plays very vital role form the students' placement and career point of view the researcher has implemented various algorithms to achieve this objective.

Basically this model will help to save time, money & mainly confusion of predicting right alternatives for engineering education after 12th. Which will also help in arranging or planning of future expenses. As their objective is to predict whether a student will get an admission or not at the desired Institute & also the rank wise list of possible colleges where they will get admission. So it's majorly classification problem. Therefore, we used Logistic Regression, K Nearest Neighbours', Decision Tree Classifier, Random Forest Classifier, Naive Bayes & Support Vector Machine Supervised Machine Learning Algorithms.

In this paper, the researchers describe the Architecture for hassle-free College prediction, compare cross-validation techniques for accuracy as performance major before and after feature engineering and finally concluded the prediction of College for career after 12th in the engineering and technology. For this study 8 input features are selected out of 20 features, which are 'Merit Marks', 'Candidate Type', 'Category', 'Home University', 'PH Type', 'Defense Type', 'HSC Eligibility', and 'BRANCH'. These features are very important according to Univariate Selection, Recursive Features Importance, & Lasso feature selection methods and massive Exploratory Data Analysis used by checking and plotting correlation between each input feature with target feature.

6. MULTIPLE MACHINE LEARNING CLASSIFIERS FOR STUDENT'S ADMISSION TO UNIVERSITY PREDICTION [ANIL B, AKRAM PASHA, AMAN, AMAN KUMAR SINGH, ADITYA KUMAR SINGH, MAY 2019]

The admission predictor developed in this study uses the student's application data that includes many features including a class variable that has binary value. This class variable is true if the student had taken admission or false if he did not. Therefore, an attempt is made in this study to predict the likelihood of new students based on their features. Using nominal and categorical attributes and past collected data this work is done at ease. Implementation of two different techniques on our data set; with that classification builds a predictive model and association rules which were used to find interesting hidden information in the student's records. This study will help the college/university to determine their direction and improve when necessary to cope up with their student admission to their college. It provides a beneficial tool to predict and evaluate those students who need attention and care and finds out any deviation before it happens and become a decrease in performance and reduce the failure rate.

The main aim of this project is to contribute towards smart prediction based on student data which can help in reducing congestion and improve quality of education. The college administration is the basic use of this application, this model predicts the binary outcome 'yes' or 'no' based on the history of admission data of students. The dataset used here is as of now synthetic and generated through the faker (python package). Some of the attributes that are used are 10th class performance, 12th class performance, competitive exam performance, college email clicked, college website visited, and so on.

The combination of both linear and non-linear machine learning algorithms are selected to be trained by the dataset. The machine learning models are tuned by performing iterative runs while training with several randomized splits to avoid over fitting and also to enhance its overall performance. As a result, the selection of the best 3 models is performed based on the evaluation metrics of the basic classifier.

7. **CAPSLG: COLLEGE ADMISSION PREDICTOR AND SMART LIST GENERATOR [KIRAN KUMARI, MEET KATARIA, VIRAL LIMBANI AND RAHUL SONI, JANUARY 2019]**

The CAPSLG system consists of a smart list generator working together with the help of college predictor, to aid students in the admission process. The college admission predictor uses historical colleges cut-off student admission data for predicting the most probable colleges. The system analyse student academic merits, background, and college admission criteria. Based on that, it predicts the likelihood of a university college that a student may enter. The smart list generator would enable the student to prepare the list of colleges, which could be needed to be filled in during the admission process. The system would also get feedback from the users, which would prove helpful for prediction evaluation and improving the performance factor.

To minimize the stress of students they came up with the idea of a computer-aided method which aims to automate this process and remove the risk holding factor of searching the number of eligible and best colleges within their vicinity. The users need to provide their academic score and the application predicts the best-suited college according to their preference, course, area and cut-off of colleges. The system also generates the list of colleges based on the above criteria which will help them to shortlist the desired college and fill the admission application more reliably.

The performance of the machine learning algorithms may vary for the database for the CAPSLG system. Hence, a comparative study of the algorithm was also performed on a sample of CAPSLG system's database, which included year, branch, category and cut-off scores as features. Thus, the AdaBoost algorithm proved more efficient for the prediction from the database for the CAPSLG system.