Using Data Mining Techniques to Predict Student Performance to Support Decision Making in University Admission Systems

Abstract: An admissions system based on valid and reliable admissions criteria is very important to select candidates likely to perform well academically at institutions of higher education. This study focuses on ways to support universities in admissions decision making using data mining techniques to predict applicants' academic performance at university. A data set of 2,039 students enrolled in a Computer Science and Information College of a Saudi public university from 2016 to 2019 was used to validate the proposed methodology. The results demonstrate that applicants' early university performance can be predicted before admission based on certain pre-admission criteria (high school grade average, Scholastic Achievement Admission Test score, and General Aptitude Test score). The results also show that Scholastic Achievement Admission Test score is the pre-admission criterion that most accurately predicts future student performance. Therefore, this score should be assigned more weight in admissions systems. We also found that the Artificial Neural Network technique has an accuracy rate above 79%, making it superior to other classification techniques considered

Pros and Cons:

The aim of this study is to support higher education institutions in making good decisions in its admissions process by predicting applicants' academic performance before admitting them. unless the processing time is high.
URL:https://ieeexplore.ieee.org/document/9042216

Graduate Admission Chance Prediction Using Deep Neural Network

Abstract: Every year many students apply for graduate admission to different universities. To select an applicant, each university has different selection criteria such as GRE score, CGPA, research background, statement of purpose, letter of recommendation, university rating etc. There are some web applications as well as some consultancy services for suggesting the appropriate university based on students' portfolio. These help to give an idea which universities should be applied for admission. But they have limitations because humans are incapable of considering all the conditions and universities. Moreover, web applications have accuracy problems. In this study, we have proposed a deep neural network (DNN) to predict the chance of getting admitted to a university according to the students 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.

Pros and Cons:

The proposed a DNN model for predicting the chance in graduate admission. Because of different ranges of data, the normalization process has been used here to resize all of them to a common scale that will speed up the training process. We have experimented with different train-test ratios using tuned hyperparameters. It shows that the proposed model has performed well using the ratio of 8:2.

URL:https://ieeexplore.ieee.org/abstract/document/9397988

Prediction of Graduate Admission using Multiple Supervised Machine Learning Models

Z. Bitar and A. Al-Mousa, "Prediction of Graduate Admission using Multiple Supervised Machine Learning Models," 2020 SoutheastCon, 2020, pp. 1-6, doi: 10.1109/SoutheastCon44009.2020.9249747.

Abstract:

In response to the highly competitive job market at present times, an increased interest in graduate studies has arisen. This has not only burdened applicants but also led to an increased workload on admission faculty members of universities. Any chance of abridging the admission process impelled applicants and faculty workers to look for faster, efficient, and more accurate methods for predicting admissions. The goal approach of this paper is to implement and compare several supervised predictive analysis methods on a labeled dataset based on real applications from the prestigious university of UCLA; Regression, classification, and Ensemble methods are all the supervised methods that are to be employed for prediction. The dataset relies profoundly on the academic performance of the applicants during their undergrad years. The coefficient of determination, as well as precision and accuracy, are the measures used to compare the different models. All predictive methods proved to show accurate results, however; certain methods proved to be more promising than others were. Predictions were obtained within short time frames, which in turn will cut down the time in the admission process.
URL: https://ieeexplore.ieee.org/abstract/document/9249747

A Comparison of Regression Models for Prediction of Graduate Admissions

M. S. Acharya, A. Armaan and A. S. Antony, "A Comparison of Regression Models for Prediction of Graduate Admissions," 2019 International Conference on Computational Intelligence in Data Science (ICCIDS), 2019, pp. 1-5, doi: 10.1109/ICCIDS.2019.8862140.

Abstract: Prospective graduate students always face a dilemma deciding universities of their choice while applying to master's programs. While there are a good number of predictors and consultancies that guide a student, they aren't always reliable since decision is made on the basis of select past admissions. In this paper, we present a Machine Learning based method where we compare different regression algorithms, such as Linear Regression, Support Vector Regression, Decision Trees and Random Forest, given the profile of the student. We then compute error functions for the different models and compare their performance to select the best performing model. Results then indicate if the university of choice is an ambitious or a safe one.URL:

Pros and Cons:

The results obtained closely resemble the actual chances of admit. The performance of the model is clearly indicative of the fact that our algorithm also works well on unseen data.

URL: https://ieeexplore.ieee.org/document/8862140