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Post Graduate Admission Prediction Using ANN

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Abstract: ***Nowadays, we see many students showing interest in higher studies away from their home countries. Generally, students often lack sufficient knowledge about the requirements, procedures, specific details of universities in countries like the USA, UK, Canada, etc. As a result, they often turn to education consultancy firms for assistance in securing admission to universities that best align with their profiles. However, this process typically requires significant financial investment in consultancy fees. The objective of this project is to create a system using Artificial Neural Network (ANN) which helps to predict the percentage of chance of admittance of students by utilizing the various test attributes like GRE, TOEFL, Research papers etc., that will assist students in assessing the likelihood of their university applications being accepted i.e., it helps them to know about what is the chance of getting admission in reputed Foreign Universities. An intuitive user-friendly interface will be developed for the users to determine their chances of admission to a university by entering their various scores.***
Keywords: Graduate Admission, Machine Learning, ANN, GRE Score, TOEFL, User Interface.

I. INTRODUCTION

Machine Learning and Deep Learning have become integral parts of various industries and domains. They are used for some of the key applications such as image recognition, natural language processing, healthcare systems, fraud detection etc., These techniques enable computers to understand hidden patterns from the data and use them to make predictions without the need of explicit programming. Deep learning models, with their multiple layers of interconnected neurons, excel at extracting complex patterns and features from large datasets.

In the context of the project, Machine learning, specifically through an Artificial Neural Network (ANN) model, is useful for predicting a student's chance of admittance into a university. This project focuses on utilizing the power of Machine Learning and Deep Learning to help students in their university admission process. Students often face challenges when selecting universities, especially research-based institutions that have specific requirements, such as high scores in exams like GRE and TOEFL. Making the wrong decisions during the application process can waste time and effort. By analyzing historical data and learning patterns, the model can estimate the likelihood of admission based on various attributes like exam scores and personal statements. By analyzing these parameters, the model can provide valuable insights and predicts the likelihood of a student admittance into a university. This helps students make informed decisions, save resources, and improve the efficiency of the admission process. By leveraging the power of data analysis and intelligent technology, the project aims to guide students and save them from unnecessary expenses associated with application fees and the need for private mentors. Ultimately, the goal is to assist students in choosing their educational path wisely and improving the overall efficiency and effectiveness of the education system.

II. LITERATURE SURVEY

1) Prediction of Graduate Admission using Multiple Supervised Machine Learning Models by Zain Bitar, Amjed Al-Mousa:

The main objective of this paper is to implement and compare various supervised predictive analysis techniques using a labeled dataset from real applications to the University of UCLA. Regression, classification, and Ensemble methods will be used to predict and evaluate the dataset, which focuses on the academic performance of applicants during their undergraduate years. The comparison of models will be based on metrics like the coefficient of determination, precision, and accuracy. While all methods yielded accurate results, some approaches showed more promise than others. These predictions have the potential to expedite the admission process significantly.

2) Predicting Student University Admission Using Logistic Regression by Sharan Kumar Paratala Rajagopal, Senior Manager, Capgemini America Inc., Dallas, USA:

The main focus of this paper is to examine the prediction of university student admission by utilizing logistic regression and considering multiple factors. A considerable number of individuals apply for Master's programs, and the decision on admission is based on specific criteria set by the college or degree program.

In this study, the independent variables will be statistically measured to forecast graduate school admission. Successful exploration and data analysis could lead to the development of predictive models that enhance the screening process for Master's degree program applicants, enabling the admission of suitable candidates.

3) Prediction of MS Graduate Admissions using Decision Tree Algorithm by Janani P, Hema Priya V, Monisha Priya S:

The above paper focuses on predicting the eligibility of Indian students for admission to top universities based on their test attributes such as GRE, TOEFL and research papers published. By calculating the chances of admission based on their scores, this project utilizes the decision tree algorithm (version 0.22.1) within the framework of machine learning. The aim is to assist students in gaining admission to the best university while also providing insights into the likelihood of admission to other universities based on their scores.

III. PROPOSED METHODOLOGY

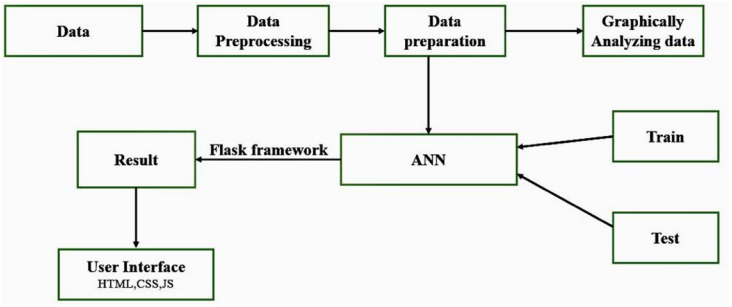


Fig. 1: System Architecture

A. *Dataset*

The dataset named ‘admission.csv’ is taken from Kaggle which consists of 500 records with 7 features and one target variable. The 7 features include ‘GRE Score’, ‘TOEFL’, ‘University Rating’, ‘LOR’, ‘SOP’, ‘CGPA’, ‘Research’ and includes ‘Serial No.’ also and the target variable is the ‘Chance of Admit’.

B. *Exploratory Data Analysis*

In this step, the dataset is checked for missing values and found that it does not have any null values and the column ‘Serial No.’ is dropped since it is not useful for prediction.

C. *Data Visualization*

Here the features are visualized using histograms and scatterplot matrix which helps in detecting outliers (found that there are no outliers), for understanding the pairwise relationships between features and also finding the correlation between the features is visualized using heatmap.

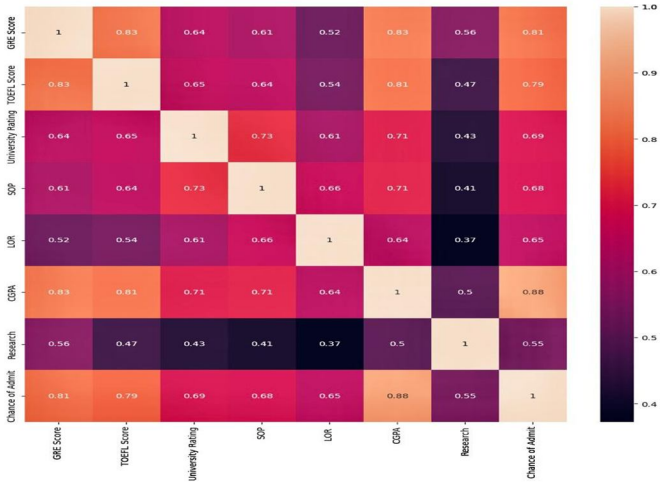


Fig. 2: Heatmap showing correlation between the features

D. Model Development:

1) Built an Artificial Neural Network (ANN) model using the Keras library in Python.

2) The dataset was split into training and testing sets to evaluate the model's performance, 85% of dataset to training data and 15% to testing data. Here input data is stored in X excluding 'Chance of Admit' and the target variable i.e., 'Chance of Admit' is stored in y.

3) Designed the architecture of the model with appropriate layers, activation functions, and optimizer. This model has a total of 11 layers with dense, activation and dropout layers in which the input and output layers are dense layers.

E. Model Training and Evaluation

1) Trained the ANN model using the training dataset and monitored the loss and accuracy metrics during training.

2) Evaluated the model using the testing dataset and calculated the accuracy score to assess its predictive performance.

3) Iterated on the model architecture and hyperparameters to improve the accuracy.

Table 1: Architecture of ANN model

Input Layer	Hidden Layer	Output Layer	Model Compilation
Dense layer with 50 neurons.	9 hidden layers with Dense layers, Activation layers, and Dropout layers with 'relu' and 'linear' activation functions.	Dense layer with 1 neuron.	Optimizer: Adam, Loss function: MSE, Epoch: 100 Batch-size: 20

F. Artificial Neural Network (ANN)

The performance of an Artificial Neural Network (ANN) depends on parameters like weights, biases, learning rate, and batch size. Each node in the ANN has a weight that contributes to the overall computation. The weighted sum and bias are calculated using a transfer function, which affects the output. The activation function processes the sum and determines the node's output, chosen based on specific requirements and desired behavior. The final output is determined by the firing value of each node, and error functions assess the differences between predicted and actual outputs. Backpropagation adjusts the weights iteratively by propagating errors, improving predictions and minimizing overall error. This continual adjustment enhances the ANN's ability to predict accurately.

IV. RESULTS

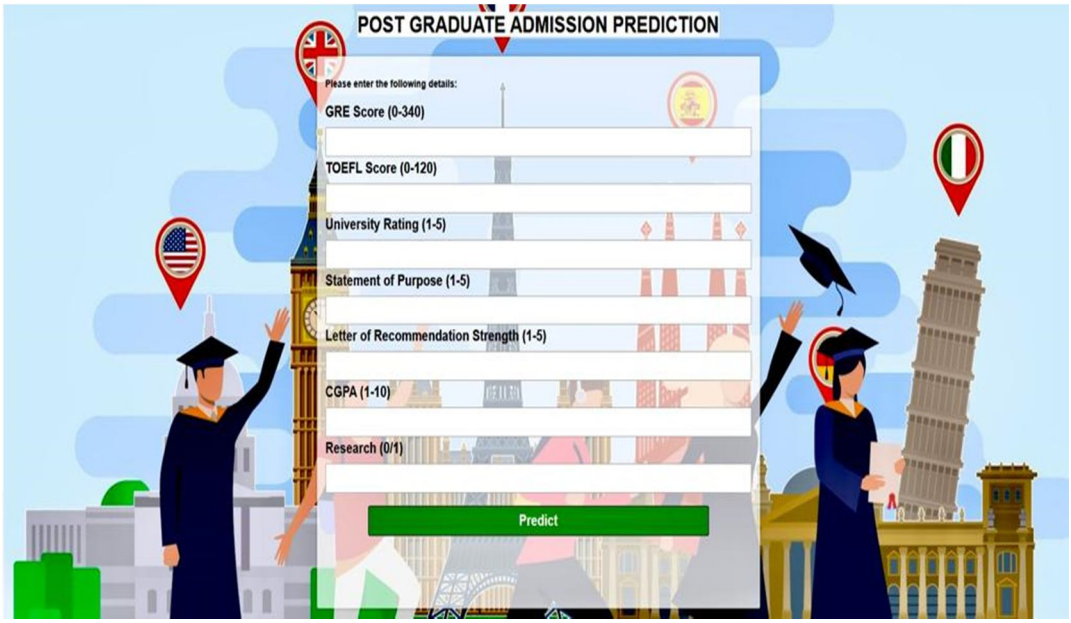


Fig. 3: The user interface created

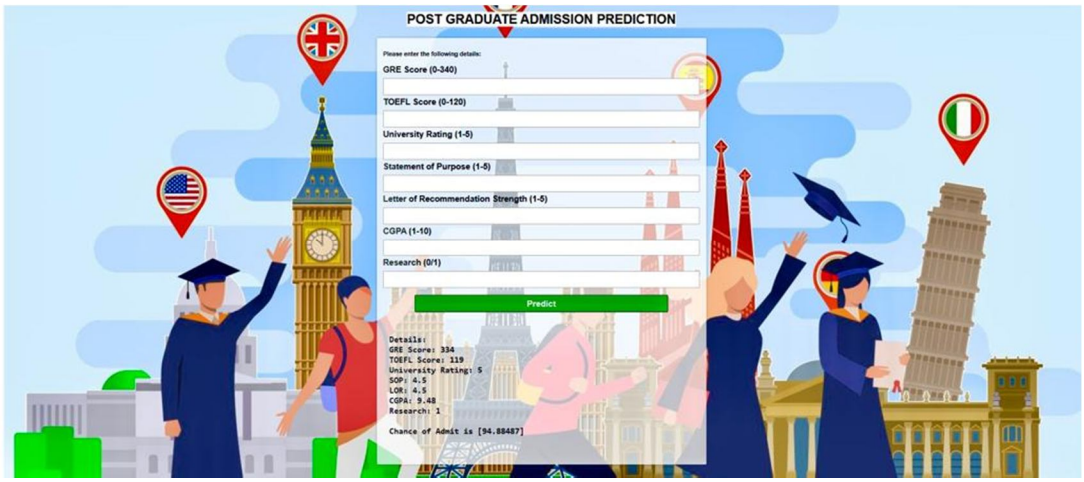


Fig. 4: Output when the user enters different values of input

Performance Metrics:

Accuracy	RMSE	MSE	MAE	R2	Adjusted R2
94.269	0.054	0.00288	0.0452	0.831	0.761

Table 2: Performance metrics of the model

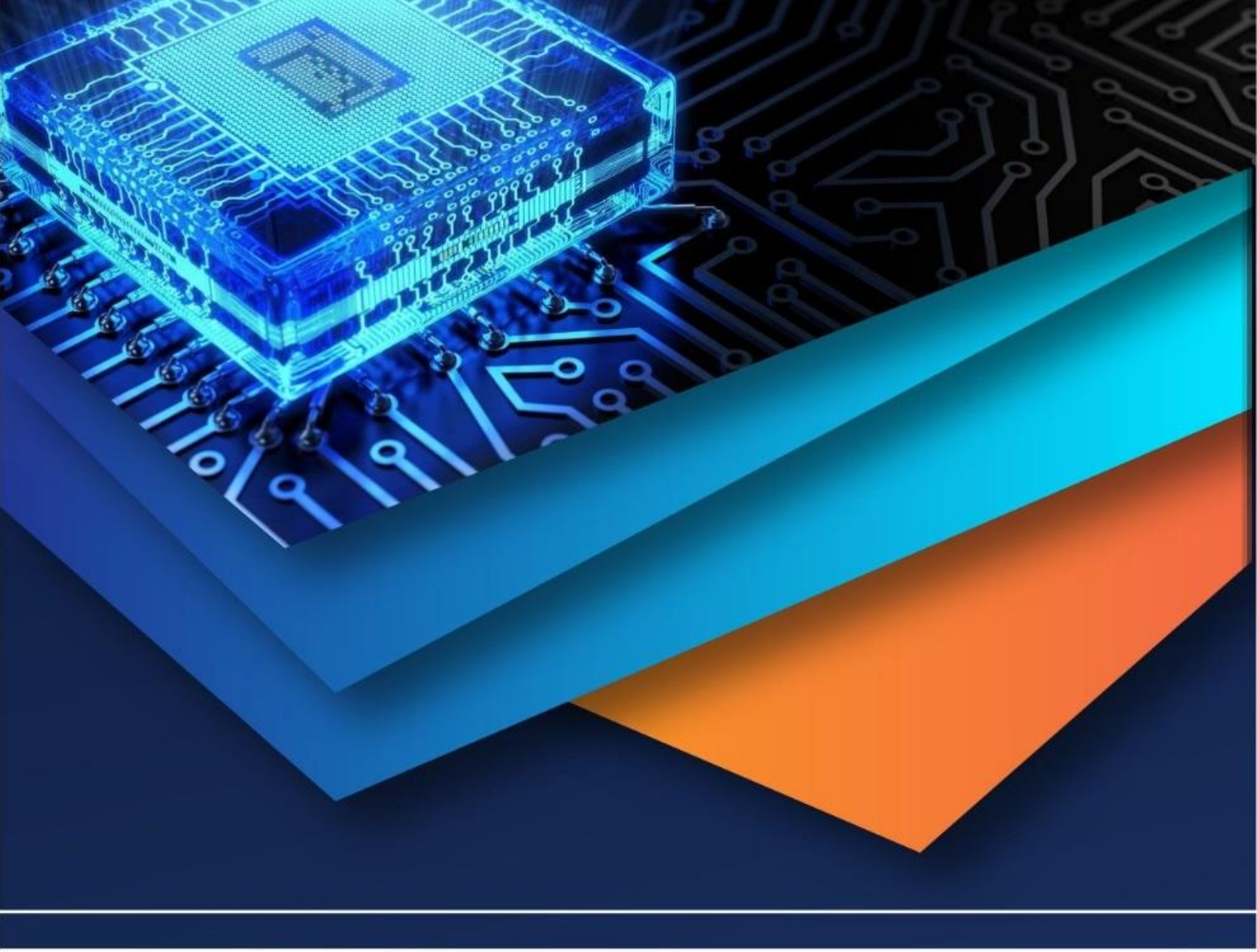
V. CONCLUSION

In this project, we predicted the chance of admit of a candidate i.e., the model can estimate the likelihood of admission based on various attributes like exam scores and personal statements with an accuracy of 94% and a low value of Mean Square Error.

In future, the project can be extended by incorporating additional features such as internship details, work experience, or other relevant parameters that may influence admission decisions. Furthermore, the model's performance can be further improved by exploring advanced neural network architectures or implementing ensemble techniques.

REFERENCES

[1] Zain Bitar, Amjed Al-Mousa (2020), "Prediction of Graduate Admission using Mutiple Supervised Machine Learning Models, 2020 Southeast Con. IEEE".
[2] Sharan Kumar, Paratala Rajagopal, June 2020, "Predicting Student University Admission using Logistic Regression, European Journal of Computer Science and Information Technology".
[3] Mohan S Acharya, Dec 30, 2019, “A Comparison of Regression Models for Prediction of Graduate Admissions, IEEE International Conference on Computational Intelligence in Data Science 2019”.
[4] Sravani Gorusu, Harsha Vardhini Eluru, "Machine Learning Model for Prediction of Post Graduate Admissions, Journal of Emerging Technologies and Innovative Research-2021".
[5] Janani P, Hema Priya V, Monisha Priya S, "Prediction of MS Graduate Admissions using Decision Tree Algorithm, International Journal of Science and Research 2018".



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