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A Survey based on Machine Learning for Recruitment Prediction

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ABSTRACT: Currently, the Engineering Recruitment India's most difficult task and problem is its pupils. Each engineering student dreams of getting hired. After putting in a lot of effort, money, and time researching, each Student excitedly awaits hiring, but finally, the majority of the students aren't hired by companies. The current state of Its abhorrent to recruit engineering students. Despite the large number of reputable, outfitted, and India is home to a reputable institute of infrastructure engineering. However, they cannot provide recruiting to every student. Each engineering student has the right to be recruited. To overcome this kind of circumstance, this prediction method Research will benefit both students and institutions. Due to this predictability will aid engineering institutions in identifying the primary characteristics needed to be hired. Knowing a student's eligibility in advance can aid to engineering schools to improve the abilities of their students to become hired, along with students. This essay offers a review of several studies conducted by various researchers, scholars that study student recruitment prediction analysis utilising data mining methods.

KEYWORDS: Classification, Data mining, SVM, Machine Learning, Prediction

I. INTRODUCTION

In today's dynamically shifting, competitive world, everyone aspires to the top position and desires to have a fulfilling life. Every young person aspires to have a noble income source and a strong life in order to accomplish this. Engineering is a noble career; thus, every student wants to do well in school and spend more money to enrol in a reputable institution with a solid reputation and infrastructure. Even students with low test scores spend more money to enrol in a prestigious school.

This research will be very beneficial in overcoming this kind of issue. This study focuses in particular on the key characteristics that a student must possess in order to be hired. Data for this study was gathered from B.Tech. student engineers in their final year. Following data collection, the SVM algorithm is used to apply data mining techniques to the student dataset, focusing primarily on nine attributes, including academic grade, practical knowledge, skilled certificates, project completion, subject knowledge in written exams and interviews, fear of written exams and interviews, communication skill in interviews, confidence in interviews, and practical interest for hiring prediction. After applying the decision tree method and pertinent formulas to the student dataset, this research establishes that the 'skilled certificate' attribute's information gain is superior to that of all other attributes.

Thus, this study comes to the conclusion that in order to be hired, a student must possess one skilled certificate in addition to having a grade of "A" or higher, excellent practical knowledge, subject knowledge above 80%, good communication skills, confidence in an interview, and project completion during the course. The student may or may not experience anxiety during the written test and the interview. Students and engineering institutes will benefit from this study. Additionally, this study will aid in reducing our nation's unemployment issue. The goal of this research article is to review different recruiting prediction techniques and student performance.

I. Problem Statement

Candidates must do the duties prior to the selection of resumes and the overall process. This projection is based on some pertinent data that should be available soon. Age, gender, work history, current wage, salary growth, and other quantitative parameters are utilised to forecast candidate hiring utilising various statistical techniques for feature selection and developing the model. These results will aid in predicting the performance of the model using different machine learning techniques.

II. Objective/Goal

The forecast is predicated, among other things, on the employee's age, experience, salary raise, job function, and proximity to home. Finding potential employees and inspiring them to apply for jobs are the objectives of recruitment.

The precise prediction helps future hiring procedures because it makes it possible to choose qualified individuals rapidly. Businesses can realise their goals and objectives thanks to collaboration between managers and workers. Making a precise prediction not only increases employee retention but also reduces the cost associated with a bad hire.

II. LITERATURE SURVEY

Jagan Mohan Reddy D 2nd Sirisha Regella 3Srinivasa Reddy Seelam et.al. This study's primary goal is to forecast when hiring effective candidates will occur, as well as how quickly and cheaply the entire hiring process will go. In order to predict the hiring candidates, this prediction is based on some pertinent quantitative and qualitative attributes, such as age, gender, work experience, current salary, salary increases, etc. It uses various statistical measures on feature selection and different machine learning algorithms to build the model. The applicants who ultimately join will be able to be predicted using these results.

Nikhil Kumar; Ajay Shanker Singh; Thirunavukkarasu K; E. Rajesh et.al. A placement predictor is a tool that can determine the likelihood or type of business that a pre-final year student will have possibilities of placing. While a forecasting programme could aid in an institution's academic planning for upcoming years. Numerous predictive models were used by studying the data set from the previous academic year thanks to the development of data mining and machine learning. This paper introduces a literature review on various statistical selection models for graduate engineering students in their pre-final year.

Ali A. Mahmoud; Tahani AL Shawabkeh; Walid A. Salameh; Ibrahim Al Amro et.al. This study suggests a further conceptual model for applying artificial intelligence (AI) to the hiring process along with performance management and social screening to forecast the predicted performance of the new candidate by examining past performances and employment conditions. The decision-makers in the employment process will receive an additional parameter thanks to this strategy. Although this method is a step in the right direction for preventing bad hiring, it requires a substantial amount of historical data, including performance tracking, personal data gathered from various sources like surveys and social media, and employee conditions related to the time of old and current employees, in order to provide results that are more effective and accurate.

Siva Surya; M.Sathish Kumar; D. Gandhimathi et.al. This study's objective is to examine student data from recent years and use it to forecast current students' placement prospects. There is a prediction algorithm built into this model. Any help in this area will boost the ability of a university to place students. Long-term, this will be advantageous for both the university and the students. This model includes a prediction technique. The data for the study was preprocessed appropriately and obtained from the same organisation that would perform the placement prediction. The proposed models were compared to other traditional classification methods in terms of accuracy. The findings show that the proposed method significantly outperforms the other algorithms.

III. SYSTEM ARCHITECTURE

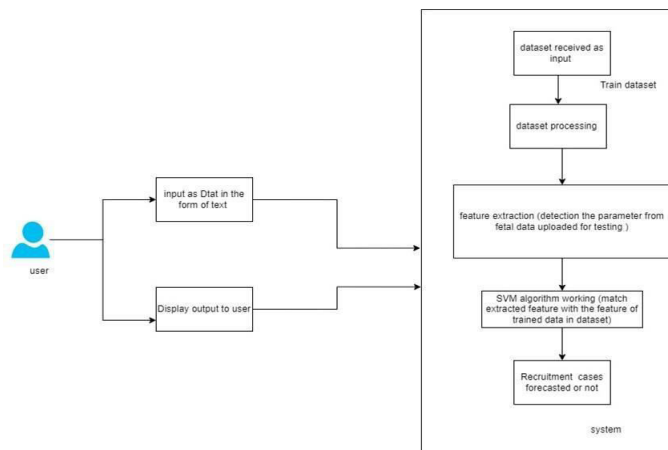


Fig 1 system architecture

A. *Methodology:*

- Describe a dataset. For a machine that doesn't see data the same way that people do, the data collected should be made standard and intelligible.
- Preparation of Real-world data typically includes noise, missing values, and may be in an undesirable format, making it impossible to build machine learning models on it directly. Data pre-processing is necessary to clean the data and prepare it for a machine learning model, which also improves the model's accuracy and effectiveness.
- Feature Extraction tries to decrease the amount of features in a dataset by generating new features from the ones that already exist (and then discarding the original features). The majority of the information in the original collection of features should then be summarised by this new, smaller set of features.
- The Classification using algorithm, which uses supervised learning to categorise new observations in light of training data, is used to recognise new observations. In classification, a programme makes use of the dataset or observations that are provided to learn how to categorise fresh observations into various classes or groups.

B. *Algorithm:*

SVM Model: On the data, the Support Vector Machine technique is used. The primary use of this supervised machine learning algorithm is classification. The algorithm that divides n-dimensional space into classes establishes a decision boundary so that a new data point that appears in the future can be quickly categorised in the appropriate category. A hyperplane is the ideal boundary for making decisions. A typical SVM attempts to separate the two classes in a way that prevents any points from being incorrectly classified. The decision boundary in this instance is excessively sensitive to noise and to slight variations in the independent variables, therefore accuracy on the test dataset may be lower. An overfit model could be produced as a result. In contrast, the model might be underfitted if the decision boundary is situated distant from the classes. Therefore, a soft margin SVM is employed to address these issues and enhance the model's performance, allowing some points to be misclassified but producing a more general model. On fresh, previously undiscovered examples, this will function better. Before we train the model, various parameters, referred to as hyperparameters, are changed to build a soft margin SVM. They assist in achieving a balance between bias and variance, preventing either overfitting or underfitting of the model. In order to achieve better results, we therefore performed SVM hyperparameter tuning. The SVM method takes into account the parameters "c" and "gamma". For each incorrectly classified data point, the C parameter applies a penalty. SVM attempts to reduce the number of incorrectly classified cases due to high penalty when c is large, which leads to a decision boundary with a narrower margin. The opposite is true when c is small. The gamma parameter regulates the range of each individual training point's influence. Low gamma values suggest a wide similarity radius, which causes more points to be grouped together. In this situation, (1) and (2) should be kept under consideration when you optimise the c and gamma parameters. $0.0001 < \text{gamma} < 10$ (1) $0.1 < c < 1000$ (2) Using the restrictions listed in (1) and (2), we used GridSearchCV to choose the optimum parameters for our model (2). When the kernel was set to "rbf," the model produced a "c" value of 100 and a "gamma" value of 0.1. The c parameter is kept between not too high and not too low, the parameter is close to the upper bound, indicating that the penalty for misclassifying the samples was kept high.

IV. CONCLUSION AND FUTURE WORK

A thorough assessment of the literature on various recruitment prediction approaches was conducted. After going through a variety of recruitment prediction literature, it is understandable that student data pertinent to academic and recruitment criteria serves as the primary foundation for recruitment prediction. A crucial foundation for predicting the potential for future hiring is provided by academic and recruitment-related characteristics. These forecasts can assist informed students in observing their skills and recovering them prior to campus recruitment. The recruitment prediction scheme is also highly helpful to Institution in terms of increasing student recruitment as well as upgrading their academic plan and design policies to advance the recruitment status of the Institution for succeeding years.

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