



Machine Learning Algorithms in Providing Personalized Career Recommendations and Job Validation and Use Cases in Native Applications

¹Dr. Abhijit Patankar, ²Krushabhsingh Suryawanshi, ³Hrushikesh Patil, ⁴Ajaypal Singh, ⁵Narendra Mukkawar, ⁶Nikita Ambekar.

¹Student, B.E Information Technology, Dr. D Y Patil College Of Engineering, Pune

²Student, B.E Information Technology, Dr. D Y Patil College Of Engineering, Pune

³Student, B.E Information Technology, Dr. D Y Patil College Of Engineering, Pune

⁴Student, B.E Information Technology, Dr. D Y Patil College Of Engineering, Pune

⁵Student, B.E Information Technology, Dr. D Y Patil College Of Engineering, Pune

ABSTRACT

Finding suitable occupations that fit their talents and interests might be difficult in today's fast-paced society. It's possible that traditional job search techniques don't always deliver personalised career advice and job validation. In recent years, personalised career advice and job validation have become more and more possible thanks to machine learning algorithms. This study seeks to investigate the use of machine learning algorithms for individualised job validation and career suggestions in native applications.

The paper will give an overview of machine learning algorithms, including data collecting and processing methodologies, various models, and performance evaluation techniques, utilised in personalised career suggestions and job validation. We will also look at how machine learning algorithms are used to validate jobs and make personalised career suggestions in native applications, as well as the effects of machine learning on recruiters and job seekers, ethical issues, and future research prospects.

Researchers and professionals involved in the domains of machine learning, career counselling, and hiring will find this study interesting. The results of this study can be utilised to create career suggestions and job validation systems that are more effective, personalised, and useful, which will eventually improve both job seekers' and recruiters' experiences with job searching.

Keywords - Machine learning algorithms, Personalised career recommendations, Job validation, Native applications, Performance evaluation

1.INTRODUCTION

The use of machine learning algorithms in personalised career recommendations and job validation is a growing field that has the potential to revolutionise the job market. With the increasing demand for skilled professionals, individuals are looking for new and innovative ways to find the right job that aligns with their interests, skills, and experience. Machine learning algorithms have shown great promise in this regard, providing personalised recommendations for career paths and job opportunities.

Machine learning algorithms can process enormous volumes of data and find patterns, trends, and correlations that human analysis could miss. A person's unique profile, which includes their education, work experience, and talents, can be used by machine learning algorithms to generate personalised suggestions. Finding occupations that fit their interests and strengths might help people achieve higher job happiness and productivity.

In employment websites and native applications, machine learning algorithms are frequently used to provide personalised career recommendations. People can get personalised employment recommendations that fit their talents and expertise by integrating machine learning algorithms into these sites. Additionally, machine learning algorithms can validate jobs, assisting in ensuring the validity and reliability of job advertisements. This is especially crucial given the frequency of false job advertisements and dishonest employers in the labour market today.

It is possible to provide personalised career recommendations and job validation using a variety of machine learning methods. Neural networks, decision trees, and random forests are a few of the most used algorithms. These algorithms operate by examining huge datasets to find patterns and trends that are then utilised to generate forecasts or suggestions.

There are various advantages to using machine learning algorithms to validate jobs and make personalised career suggestions. For job seekers, it offers a quicker approach to identify pertinent employment prospects and lessens the time and effort needed to sort through numerous job posts. Making sure that job postings are directed towards the appropriate people aids firms in attracting applicants of higher calibre.

2. REVIEW OF LITERATURE

Work By B. Alghamdi and F. Alharby (2019)

The article suggests an automated application that uses machine learning-based classification approaches to prevent fraudulent job postings online. The outputs of various classifiers are evaluated in order to determine the best employment scam detection model. These classifiers are used to verify fraudulent posts on the web. It assists in identifying phony job postings among a large number of postings. For the purpose of identifying fake job postings, two main categories of classifiers—single classifiers and ensemble classifiers—are taken into consideration. Yet, experimental data show that ensemble classifiers are superior to single classifiers for detecting scams.

Work By Sokratis Vidros (2016)

Only recently has the crucial hiring procedure been moved to the cloud. In particular, the automated systems in charge of conducting online employee recruiting seek to speed up, improve the accuracy, and reduce the cost of the hiring process. Yet, the internet exposure of these conventional business practices has created new points of failure that could cause applicants' privacy to be violated and damage firms' reputations. Employment scams are currently the most frequent type of online recruitment fraud (ORF). Contrary to pertinent internet fraud issues, ORF has not yet received the required attention and has mostly gone ignored up until this point. The current study outlines and characterises the traits of this severe and urgent innovative cyber security in response to this demand research subject. In addition, it contributes and assesses the first publicly accessible dataset of 17,880 annotated job advertisements that has been obtained through the usage of a real-world system.

Work By Samir Kumar Bandyopadhyay (2020)

By developing a trustworthy model that can identify fraud exposure in online recruitment environments, this study aims to prevent privacy violations and financial losses for people and businesses. This study offers a significant contribution in the form of an accurate detection model for online recruitment fraud utilising an ensemble technique based on Random Forest classifier (ORF). The current nature and dearth of studies on this idea distinguish online recruitment fraud detection from other sorts of electronic fraud detection. To meet the goals of this study, the researcher suggested the detection model. Support vector machines are utilised for feature selection, while ensemble classifiers employing Random Forest are used for classification and detection. A free database referred to as Employment Scam Aegean. The model is implemented using the EMSCAD dataset. Prior to the adoption of selection and classification, a pre-processing phase had been used. The findings revealed a 97.41% achieved accuracy. Also, the results showed that having a company profile feature, having a corporate logo feature, and having an industry feature are the key features and crucial variables in detecting purposes.

Work By Scanlon, J.R. and Gerber (2014)

Due to the unregulated nature of Internet communication, cyber-communities have emerged as a result of the rising usage of the Internet as a primary means of communication. These communities are drawing more and more attention from terrorist organisations. Internet groups give violent extremists the chance to connect on a personal level with a global audience that can access uncensored content, which helps them enhance recruitment. This article offers techniques for spotting violent group recruitment efforts on extreme social media platforms. The untested problem of automatically recognising forum posts meant to recruit new violent extremist members is the focus of our methods, which specifically employ well-known techniques from supervised learning and natural language processing. We used information gathered by the University of Arizona's Dark Web Project from the western jihadist website Ansar AlJihad Network Project. A sample of these data was carefully annotated by many judges, who classified 192 randomly selected posts as recruiting (YES) or not recruiting (NO) (NO). Cohen's $\kappa = (0.5, 0.9)$ at $p = 0.01$ indicates that the judges' labels agree significantly. We examined the viability of classifying the forum posts using naive Bayes models, logistic regression, classification trees, boosting, and support vector machines (SVM). Our SVM classifier outperforms our simplest naive Bayes model by 89% area under the curve (AUC) when evaluated using receiver operating characteristic (ROC) curves (Tukey's test at $p = 0.05$). This is a substantial improvement over the 63% AUC performance of the naive Bayes model. As far as we are aware, this is the first result on this topic to be disclosed, and our study shows that it is possible to detect online terrorist recruitment automatically.

3. THE PROPOSED SYSTEM

The suggested solution intends to deliver customised career recommendations and job validation through native machine learning techniques. Based on user preferences, employment experience, education level, and industry, the system uses a random forest algorithm to deliver precise job recommendations.

The user is first asked to build a profile with personal and professional data, such as their current job title, industry, location, degree of education, and years of experience. The system will prompt the user to select the types of jobs they are interested in, including job titles, industries, and locations, after they have completed their profile. A user preference profile will be developed using this data and used in the job recommendation process.

The user's current industry and job title are verified in the following step. The system will verify that the user-provided job title and industry are correct and align with their level of education and experience. Through this verification procedure, the system will make sure that the user's profile is accurate and that the job recommendations it provides are pertinent and customised.

The system will produce a list of suggested jobs based on the user's interests and profile after validating the user's work title and industry. The random forest algorithm will be used in the job suggestion process to give the user precise and customised job recommendations. To generate job recommendations that match the user's profile and tastes, the algorithm will take into account the user's preferences, employment experience, education level, and industry.

The native application will allow the user to view the recommended jobs and their job descriptions. The user can then apply immediately for the jobs they are interested in or save the position for later viewing from within the application. The system will record the user's job search activities and offer tailored job recommendations based on their preferences and search activities.

A job validation mechanism is also included in the suggested system to guarantee that the user's job titles and industries are current and accurate. The system will examine the user's job title and industry on a regular basis; if any differences are discovered, the user will be prompted to change their profile. The user's profile will always be current and correct thanks to this feature, which will enhance the accuracy of the system's job recommendations.

The suggested system will offer career assistance to the user in addition to job recommendations and validation. The system will offer details on the education and experience needed for various job titles and industries, as well as details on prospects for career advancement. The user's career decisions will be supported by this feature, which will also raise their prospects for employment.

4. FUTURE WORK

Expanding the breadth of the job validation and recommendation system to include a larger variety of characteristics, such as personality traits, soft skills, and personal interests, is one potential subject of future research. By adding more data points, the system might give job seekers even more precise and thorough recommendations, assisting them in finding the ideal match for their individual talents and interests.

Future study will also look into the feasibility of using natural language processing (NLP) methods to examine job descriptions and other text-based data in order to enhance the precision and applicability of the recommendations made. The system might deliver more exact and nuanced recommendations by utilising NLP technologies to determine the most crucial keywords and phrases associated with each job posting, taking into consideration the unique requirements and preferences of each company.

Future research in personalised learning has a lot of potential, and it might use machine learning algorithms to modify suggestions and validation standards over time in response to user input and performance data. The system may fine-tune its algorithms and increase the precision of its suggestions over time by continuously tracking the success rates and outcomes of suggested job posts, ultimately giving job seekers a more tailored and successful experience.

Overall, there are still many unexplored possibilities for further study and development in the area of machine learning algorithms for personalised career suggestions and job validation. These technologies have the potential to revolutionise how we approach career planning and job search as they develop and get better, enabling people to make wiser and more fruitful career decisions.

5. RESEARCH METHODOLOGY

The research technique for this study consists of a number of processes, including model selection, model preprocessing, model training, and model testing. A thorough explanation of each step is provided in the section that follows:

1. **Data Collection:**Collecting pertinent data is the first stage in creating a machine learning model for individualised career recommendations and job validation. We will gather information about jobs for this study from a variety of job portals and career websites. Included in this information are job titles, job descriptions, necessary skills, degree of education, location, and industry..
2. **Data Preprocessing:** After collecting the data, the next step is to preprocess it. Preprocessing involves cleaning the data, handling missing values, and transforming categorical data into numerical data. We will use Python and pandas library to preprocess the data.
3. **Feature Selection:** Feature selection is an important step in machine learning that involves selecting the most relevant features from the dataset. In this study, we will use the Random Forest algorithm to identify the most important features for personalised career recommendations and job validation.
4. **Model Selection and Training:** The next step is to select the appropriate machine learning algorithm for the model. In this study, we will use the Random Forest algorithm for its ability to handle large datasets, perform feature selection, and provide accurate predictions. We will also use the scikit-learn library to train the model.

5. **Model Evaluation:** Once the model is trained, we will evaluate its performance using various evaluation metrics such as accuracy, precision, recall, and F1 score. We will also perform cross-validation to ensure that the model is not overfitting the data.
6. **Hyperparameter Tuning:** Hyperparameter tuning is the process of selecting the best set of hyperparameters for the machine learning algorithm. In this study, we will use grid search to find the optimal hyperparameters for the Random Forest algorithm.
7. **Deployment:** After the model is trained and evaluated, the next step is to deploy it in a native application. We will use React Native for this purpose. React Native is a popular framework for building native mobile applications using JavaScript.
8. **User Feedback:** Finally, we will collect user feedback on the personalized career recommendations and job validation provided by the native application. This feedback will help us improve the model and make it more accurate and effective

6. CONCLUSION

Job searchers can gain a lot from the suggested approach, which uses machine learning techniques to provide tailored career recommendations and job validation in native applications. Based on the job seeker's location, industry, and degree of education, the system generates precise and personalised job recommendations using a random forest algorithm. Job searchers are more confident in their job search as a result of the validation procedure, which verifies the legitimacy and reputation of the proposed employment postings.

Implementing this approach can assist job searchers find more relevant and accurate job recommendations while also cutting down on the time and effort needed for the job search process. With time, more precise job matches result from the use of machine learning algorithms, which guarantees that job recommendations are always improving based on user feedback.

Future research can concentrate on enhancing the system's capabilities by adding further elements including professional experience, skill sets, and personal preferences. The system may be improved to offer more thorough career advice, along with recommendations for your specific skills and education.

REFERENCES

1. Ali, A. 2001. Macroeconomic variables as common pervasive risk factors and the empirical content of the Arbitrage Pricing Theory. *Journal of Empirical finance*, 5(3): 221–240.
2. Basu, S. 1997. The Investment Performance of Common Stocks in Relation to their Price to Earnings Ratio: A Test of the Efficient Markets Hypothesis. *Journal of Finance*, 33(3): 663-682.
3. Bhatti, U. and Hanif. M. 2010. Validity of Capital Assets Pricing Model. Evidence from KSE-Pakistan. *European Journal of Economics, Finance and Administrative Science*.