

JOB RECOMMENDATION

LITERATURE SURVEY

[1]. TECHNICAL JOB RECOMMENDATION SYSTEM USING APIs AND WEB CRAWLING

Naresh Kumar, Maish Gupta, Deepak Sharma, and Isaac Ofari,2022.

There has been a sudden boom in the technical industry and an increase in the number of good start-ups. Keeping track of various appropriate job openings in top industry names has become increasingly troublesome. This leads to deadlines and hence important opportunities being missed. Through this research paper, the aim is to automate this process to eliminate this problem. To achieve this, Puppeteer and Representational State Transfer (REST) APIs for web crawling have been used. A hybrid system of Content-Based Filtering and Collaborative Filtering is implemented to recommend these jobs. The intention is to aggregate and recommend appropriate jobs to job seekers, especially in the engineering domain. The entire process of accessing numerous company websites hoping to find a relevant job opening listed on their career portals is simplified. The proposed recommendation system is tested on an array of test cases with a fully functioning user interface in the form of a web application. It has shown satisfactory results, outperforming the existing systems. It thus testifies to the agenda of quality over quantity.

[2].ENHANCED DSSM (DEEP SEMANTIC STRUCTURE MODELLING) TECHNIQUE FOR JOB RECOMMENDATION

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Now a day's recommendation system takes care of the issue of the massive amount of information overload problem and it provides the services to the candidates to concentrate on relevant information on job domain only. The job recommender system plays an important role in the recruitment process of fresher as well as experienced today. Existing job recommender system mainly focuses on content-based filtering to extricate profile content

and on collaborative filtering to capture the behaviour of the user in the form of rating. The dynamic nature of the job market leads to cold start and scalability issues. This problem can be addressed by item-based collaborative filtering with a machine learning technique, it learns job embedding vectors and finds similar jobs content-wise. The existing model in the job recommender domain uses the confining model to address the cold start and scalability issue and provide better recommendations, but they fail to accept the complex relationships between job description and candidate profile. In this paper, we are proposing a Deep Semantic Structure Algorithm that overcomes the issue of the existing system. The deep semantic structure modelling (DSSM) system uses the semantic representation of sparse data and it represents job description and skill entities in character trigram format which increases the efficacy of the system. We are comparing the results to three variations of DSSM model with two different datasets (Naukari.com and CareerBuilder. com) and it gives satisfactory results. Experimental results shows that the DSSM Embedding model and its other variants are provides promising results in solving cold start problem in comparison with several variants of embedding model. We used Xavier initializer to initialise the model parameter and Adam optimizer to optimize the system performance.

**[3]. REVIEW ON RESUME ANALYSIS AND JOB RECOMMENDATION USING AI
Prof. Sneha A. Khaire, Ms. Ruchita B. Birari, Ms. Riddhi S. Jagale, Ms. Sanskruti A. Patil, Ms. Surovika T Paul, Sandip Institute of Technology and Research Centre, 2021.**

Applications of AI technology-based 60 minutes meeting have step by step attracted public attention and have become fashionable. The system developed within the same study may be explained in 2 elements, particularly from the attitude of the work person which of the work recruiter. we will essentially take the majority of input resume from the consumer company which consumer company will offer the necessity and therefore the constraints to that the resume ought to be hierarchical by our system. This study depends on resume analysis and therefore the technique adopted area unit machine learning and text-mining primarily based artificial intelligence-NLP. The system works as talent recommendation system for the businesses and job recommendation system for the work candidates.

[4]. JOB RECOMMENDATION SYSTEM

Bhavya Chawla, Naitik Kansara, Sakshie Pathak, Mr. S. B. Nikam, 2021

Recommendation Systems are omnipresent on the web nowadays. Most websites today are striving to provide quality recommendations to their customers in order to increase and retain their customers. In this paper, we present our approaches to style employment recommendation system for a career based social networking websites. We take a bottom-up approach: we start with deeply understanding and exploring the info and gradually build the smaller bits of the system. We also consider traditional approaches of advice systems like collaborative filtering and discuss its performance. Our experiments show the efficacy of our approaches.

[5]. THE MULTI AGENT SYSTEM FOR JOB RECOMMENDATION

Meilany Nonsi Tentua, Azhari Azhari, Aina Musdholifah Teknik Informatika, Fakultas Teknik, Universitas PGRI Yogyakarta, Indonesia, Department of Computer Science and Electronics, 2020.

The number of available job portals causes abundant information. Therefore, a system of recommendations is needed by job seekers to find jobs that fit their profile. Offering job vacancies on job portals are changing every time because there are always additional job search data and job opening data. A multi-agent system is a technology that can be used to handle information changes. This article proposed a recommendation system that is expected to help job seekers to get jobs in accordance with the field of science they have. The system will monitor what work is offered by online job portals. From the results of observations, the job content offered will be used as a reference so that if new content is entered, the agent will automatically provide input to the job seeker. Based on the results of the implementation of the recommendation system using a multi-agent system can provide search results that are in accordance with what is inputted by the user based on the profile they have. These search results can recommend jobs that match the job seeker's profile.

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[6]. IMPLICIT SKILLS EXTRACTION USING DOCUMENT EMBEDDING AND ITS USE IN JOB RECOMMENDATION

Akshay Gugnani, Hemant Misra, IBM Research – AI, 2020

This paper presents a job recommender system to match resumes to job descriptions (JD), both of which are nonstandard and unstructured/semi-structured in form. First, the paper proposes a combination of natural language processing (NLP) techniques for the task of skill extraction. The performance of the combined techniques on an industrial scale dataset yielded a precision and recall of 0.78 and 0.88 respectively. The paper then introduces the concept of extracting implicit skills – the skills which are not explicitly mentioned in a JD but may be implicit in the context of geography, industry, or role. To mine and infer implicit skills for a JD, we find the other JDs like this JD. This similarity match is done in the semantic space. A Doc2Vec model is trained on 1.1 million JDs covering several domains crawled from the web, and all the JDs are projected onto this semantic space. The skills absent in the JD but present in similar JDs are obtained, and the obtained skills are weighted using several techniques to obtain the set of final implicit skills. Finally, several similarity measures are explored to match the skills extracted from a candidate's resume to explicit and implicit skills of JDs. Empirical results for matching resumes and JDs demonstrate that the proposed approach gives a mean reciprocal rank of 0.88, an improvement of 29.4% when compared to the performance of a baseline method that uses only explicit skills.

[7]. RECOMMENDATION SYSTEM FOR WORKERS & CUSTOMERS FOR INFORMAL JOBS

**Manasi Purkara, Omkar Joshia , Abhishek Salapea , Ankush Patila , Varad Kulkarnia
Dr. Pravin Futaneb, 2021**

Recommender systems are software applications that provide or suggest items to users. These systems use filtering techniques to provide recommendations. The Purpose of this recommendation system was to provide services to small or part-time workers. It has been observed by the team that recommendation systems that are studied have not focused on small workers like electricians and carpenters but the corporate people. Recent trends in technology have made us dependent on technology too much itself. To cope up with the problems of urbanization and employment trends in this ever-changing world, a well-suited

system for corporate workers as well as skilled laborers should coexist. This model is designed to help recruiters to hire employees based solely on work type and rating. A Recruiter can hire a person for a specific task or time frame dependent on what type of employee he/she is expecting. It is designed in such a way that it will help to reduce the gap between both of them leading to a hassle-free experience for an employer as well as an employee. The content-based technique is adopted as it is used to know the content of both user and item. A Manually generated dataset is used by taking the reference of the standard dataset of the formal employees present on the Kaggle website. This system is based on the Vector Space Model and TF-IDF vectorizer. A literature survey of several research papers in the same domain was conducted. The recommendation system has been implemented in the python programming language. The results obtained were quite accurate which helps to recommend jobs to workers and workers to customers in the required work field.

[8]. JOB RECOMMENDATION SYSTEM USING MACHINE LEARNING AND NATURAL LANGUAGE PROCESSING

Jeevan Krishna, Data Analytics, Dublin Business School, 2020

The rise of digital communication and the spread of the internet has made an enormous impact in every industry. One such domain is the Hiring process, where a job seeker applies to a job by creating a profile on a job portal by providing all his/her work preferences. These work preferences of each user can be collected from each user and provide job recommendations based on their preference. There had been work done in this field, where researchers have implemented RecSys using the Hybrid filtering method as user data had previous interaction with item (Rafter et al., 2000). In this dissertation, we have approached the problem with the three-tier approach design. Data acquired for our study has no previous interaction between the user data and Job listing data. With such a dataset, we have addressed the issue of cold start from both User and Job perspective. Also, recommend the top-n job to the user by analysing and measuring similarity between the user preference and explicit features of job listing using Content-based filtering, which is devised in support of natural language processing and cosine similarity. The Recommender System is then evaluated using precision, recall, and F1 score (Barrón-Cedeno et al., 2009). The top-n recommendation made to the user is presented in the third tier of the design, a web app deployed in the local server. The presentation layer web-app is developed using Plotly's dash web framework.

[9]. IMPLEMENTATION OF AN AUTOMATED JOB RECOMMENDATION SYSTEM BASED ON CANDIDATE PROFILES.

V Desai, D Bahl, S Vibhandik, Fatma Desai, V., Bahl, D., Vibhandik, S. and Fatma, I., 2017. Int. Res. J. Eng. Technol, 4(5), pp.1018-1021.

This work is an attempt to collate the data and discover the foremost relevant candidate-job association mapping concurring to the skills, interests, and preferences of a user and to provide a possible job opportunity as an efficient solution. Recommender framework aims to assist in searching for jobs that coordinate user preferences and it has a successful usage in a wide range of applications to deal with problems related to information overload efficiently. This work will analyze issues for building personalized recommender frameworks for candidates and work matching. An attempt has been made to formulate this study of recommendation as a supervised machine learning problem.

[10]. JOB RECOMMENDATION SYSTEM USING PROFILE MATCHING AND WEB-CRAWLING.

Deepali V Musale , Mamta K Nagpure, Kaumudini S Patil, Rukhsar F Sayyed. Computer Science & Engineering, K K Wagh College of Engineering, Nashik, India, 2017.

The developed system is job recommendation system for campus recruitment which helps college placement office to match company's profiles and student's profiles with higher precision and lower cost. For profile matching, two matching methods are used: semantic matching, tree-based knowledge matching and query matching. These methods are integrated according to representations of attributes of students and companies, and then the profile similarity degree is acquired. Based on profile similarity degree, preference lists of companies and students are generated. Also students can perform keyword based search for job profiles from various job recruitment sites (e.g. Naukari.com, indeed.com). For obtaining data from online recruitment sites system uses web crawling. With loop matching, matching results would be further optimized and provide more effective guidance for recommendation.