LITERATURE SURVEY

IBM TEAM 5
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DOMAIN NAME: EDUCATION
USE CASE NAME: SKILL AND JOB RECOMMENDER SYSTEM

PAPER I

Authors: Aritra Ghosh, Beverly Woolf, Shlomo Zilberstein, Andrew Lan

Year: 2021

Title: Skill-based Career Path Modeling and Recommendation

Methodology: Details the MNSS model for user career path modelling. Black-box neural network-based models are generally not interpretable, which means that they can excel at prediction while being unable to provide actionable feedback to users.

Advantage: This model achieves excellent predictive performance on the tasks of the company, job title, and skill prediction. Moreover, a series of case studies were used to show that the model is interpretable and can be used to provide actionable feedback to users on the skills they need to acquire and recommendations on feasible career paths they can take to achieve their desired career goal.

Disadvantage: Since real-life constraints including geographical, transportation, and family constraints are significant factors in a user's career decision, they should be taken into account by the career path planning algorithm.

PAPER II

Authors: Joseane Pontesy, Carla A. S. Geraldes_, Florbela P. Fernandes_, Lucas Sakurada_, Ann Lilith Rasmussenz, Lasse Christiansenz, Sabine Hafner-Zimmermannx, Kieran Delaney{, Paulo Leitão

Year: 2021

Title: Relationship between Trends, Job Profiles, Skills and Training Programs in the Factory of the Future

Methodology: This paper reports our recent work on comprehensive information access in a different domain – job search. Job search is a relatively new domain for information access, yet a challenging and important one. Since companies mainly rely on the Internet to search for the right human resources, they post their job openings on Web sites and job search systems.

Advantage: This paper proposes a model that contributes to understand how technological trends may impact new job profiles and relevant new skills, as well as how these skills may be upskilled by the workforce through available training programs according to their gaps and impact. This will stimulate the creation of a skilled workforce and a lifelong learning system focused on a sustainable employability model, by qualifying professionals through the continuous training to face the digital opportunities for the factory of the future.

Disadvantage: Candidates' personal interests are not taken into account. The jobs are matched solely based on what the recruiter needs, with not much attention given to the interests specified in the candidates' resume.

PAPER III

Authors: Danielle H. Lee & Peter Brusilovsky

Year: 2007

Title: Fighting Information Overflow with Personalized Comprehensive Information Access: A Proactive Job Recommender

Methodology: The job recommendation system Proactive, presented in this paper, attempts to bring together a range of technologies. The focus and innovation of our work is twofold. First, we attempted to provide a true integration of these approaches whereby one approach can capitalize on the others and where weaknesses of one approach are balanced by the strengths in others. Second, we attempted to integrate several personalization approaches into one system, using the theories behind recommender systems and adaptive hypermedia.

Advantage: This system was developed to accomplish two different user requirements: concentrate on a certain kind of information and navigate through a wide range of information. Based on the recommendation taxonomy, multiple ways to access information were provided, from a non-personalized page to a highly user-adaptive page.

Disadvantage: User satisfaction and efficiency of information delivery between two systems were not explored. It is expected that these features can be applied to build an open user model of job seekers.

PAPER IV

Authors: Peng Yi, Cheng Yang , Chen Li, Yingya Zhang

Year: 2016

Title: A Job Recommendation Method Optimized by Position Descriptions and Resume Information

Methodology: In this paper, historical delivery weight calculated by position descriptions and similar user weight calculated by resume information were added as two influencing factors in the preference prediction formula.

Advantage: The optimization method has largely improved the precision and recall rate when 1-7 positions have been recommended. Real world job recommendation systems recommend 3-6 positions each time that meet the need of job hunters. That means our optimization method might be a promising candidate algorithm for job recommendations.

Disadvantage: Accuracy falls for large data sets of job hunter information.

PAPER V

Authors: Yingya Zhang, Cheng Yang, Zhixiang Niu

Year: 2014

Title: A Research of Job Recommendation System Based on Collaborative Filtering

Methodology: In this paper, a contrast between user-based and item-based collaborative filtering algorithm is done to choose a better performed one.

Advantage: The test results indicate the improved recommender with a rescorer is better than a traditional item-based one. Our student job hunting recommender achieved higher precision, recall and F1 score. Furthermore, the recommended jobs are more relevant with students' preferences.

Disadvantage: To further optimize the recommendation system and ameliorate the scarcity of user profile, some methods of filling users' preference matrix can be utilized, for example, take advantage of students' implicit behaviours in process of job hunting, which need further research.

PAPER VI

Authors: Amber Nigam, Aakash Roy, Hartaran Singh, Harsimran Waila

Year: 2019

Title: Job Recommendation through Progression of Job Selection

Methodology: The framework created for the recommender system includes a Website for showing Jobs, a Brain module and a Worker module. The role of the Brain is to create a relaxed job funnel criterion and send it to the Worker, receive the results, compose the recommendations and send it back to the user.

Advantage: Overcomes the problem of candidate and job cold-start in the absence of interaction history. It is also shown that the use of latent competency groups helps in capturing the hidden skill domains for the candidates and the jobs.

Disadvantage: Requires high-end computer machinery to run the website. Application-based implementation is also not available for the recommender system.