2.2. Use. of machine learning in recommender systems

Sidahmed Benabderrahmane et al. [[4]](https://www.sciencedirect.com/science/article/pii/S2666412721000489#bib0004) proposed a [decision making tool](https://www.sciencedirect.com/topics/computer-science/decision-making-tool) to provide a path to recruiters which help them to get the efficient job seekers. It represented a Doc2Vec [embedded system](https://www.sciencedirect.com/topics/engineering/embedded-system) which stores the information of clickstream history of job seekers in the database. It also uses [deep neural networks](https://www.sciencedirect.com/topics/computer-science/deep-neural-network) to get the future prediction of clicks using various job boards database. It overcomes the problem of over fitting using dropout layers. Nedra Mellouli et al*.* [[5]](https://www.sciencedirect.com/science/article/pii/S2666412721000489#bib0005) in similar context represented a smart4job recommender system that connects the job aspirants with job offers that matches their profiles the most. The model works on temporal prediction and domain knowledge analysis. Miao Jiang et al. [[6]](https://www.sciencedirect.com/science/article/pii/S2666412721000489#bib0006) further improved the model by introducing email mode. In this system, the candidates provide their resumes to get email alerts about the new job offers. But these above models partially explain the context. To resolve this issue, Priscila Valdiviezo Diaz et al. [[7]](https://www.sciencedirect.com/science/article/pii/S2666412721000489#bib0007) uses [Bayesian model](https://www.sciencedirect.com/topics/computer-science/bayesian-model) for the recommendation process. This model based on collaborative filtering method which uses user-item correlation. The collaborative filtering technique builds a database of users’ interests. It then matches those relevant interests with other similar users to make accurate recommendation. This kind of users basically makes a group consisting of more number of users. Shibbir Ahmed et al. [[8]](https://www.sciencedirect.com/science/article/pii/S2666412721000489#bib0008) introduce an online recruitment system that will use by recruiters to get the efficient candidates. It uses hybrid filtering technique between training and [testing dataset](https://www.sciencedirect.com/topics/engineering/testing-dataset). It selects top job offers as the recommended list and makes selection based on that. Shiqiang Guo et al. [[9]](https://www.sciencedirect.com/science/article/pii/S2666412721000489#bib0009). proposed a system named as ResuMatcher. It basically matches the resumes with the corresponding job offers. It uses [machine learning](https://www.sciencedirect.com/topics/computer-science/machine-learning) techniques to get the effective results. This paper also deals with [natural language processing](https://www.sciencedirect.com/topics/computer-science/natural-language-processing) (NLP) for the recommendation process.

2.3. Social. network based job recommender systems

Although the above models have achieved significant improvements as compared to traditional models using various filtering techniques. But there is a need to recommend socially which includes friends of similar interest. Mamadou Diaby et al. [[10]](https://www.sciencedirect.com/science/article/pii/S2666412721000489#bib0010) use Facebook and LinkedIn dataset for the implementation of their work. The system collects the information about the users from social networks for recommending suitable jobs to them. It represents architecture for taxonomy based job recommender system. But the limitations are that some information is in private mode which leads to wrong assumptions. Linear SVM needs to be trained for accurate predictions. Fan et al. [[11]](https://www.sciencedirect.com/science/article/pii/S2666412721000489#bib0011) introduced a graphical network named as GraphRec for recommendation using social networks. It uses interactions and opinions of users for the recommendation process by modeling the graph data. Ma et al. [[12]](https://www.sciencedirect.com/science/article/pii/S2666412721000489#bib0012) also discussed about social networks including [latent factors](https://www.sciencedirect.com/topics/engineering/latent-factor). It focuses on [matrix factorization](https://www.sciencedirect.com/topics/computer-science/matrix-factorization) to improve the recommendation results. But there is still needs to explore the various tools and techniques for better social recommendation.