Inspiring Excellence

CSE424

Assignment 01

Section - S02

Submitted by

Ahsan Habib

ahsan.habib1@g.bracu.ac.bd

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Paper Review: Application of LLM Agents in Recruitment: A Novel Framework for Resume Screening

Url: https://arxiv.org/abs/2401.08315

1. Summary of the paper : [1.1 Motivation] : One important yet time-consuming stage in the hiring process is screening resumes. The goal of this project is to automate the process in order to decrease human labour, minimise biases, and increase the precision and speed of choosing qualified applicants. The goal of this project is not to build a system that can intelligently and human-likely compare resumes to the job criteria by utilising Machine Learning (ML) and Natural Language Processing (NLP). **[1.2 Contribution] :** A multi-agent framework is introduced by the system, in which several LLM-based agents extract, access, summarise and score resumes in relation to the job description. The authors built a pipeline that uses spaCy for preprocessing, BERT for semantic similarity and Flask for the web interface. BERT achieved 92% accuracy in resume-job matchmaking, outperforming traditional TF-IDF models. **[1.3 Methodology] :** The researchers collected 2000 resumes from LinkedIn and Kaggle, removed demographic information, and applied pre-processing with spaCy. The researchers fine-tuned language models to process resumes and job descriptions, evaluated resume relevance, and validated the system's scoring by comparing it to expert HR ratings. Experiments demonstrated improved efficiency, achieving up to an 11 times increased speed and an 87.73% F1 score in classification tasks. **[1.4 Conclusion] :** Overall, the results suggest that LLM-based systems are able to replicate human judgment with a good degree of accuracy and consistency while reducing hiring times, though not necessarily compromising hiring quality.

2. Limitations : [2.1 First limitation] : The dataset predominantly comprises publicly available resumes, leading to underrepresentation of non-english speakers and non-technical applicants, which limits generalizability. **[2.2 Second limitation] :** The pipeline encounters challenges with unstructured resume formats, such as PDFs with tables or columns. Hindering scalability.

3. Synthesis : Integrating graph neural networks could enhance resume-job matching by modeling relationships between skills, roles and industries. Unsupervised techniques like clustering might reveal hidden candidate competencies. Expanding input parameters (e.g: Candidate diversity scores, market demand for skill) and incorporating unstructured data (e.g: PDF parsing) would improve real-world applicability. Collaborating with HR platforms could enable large-scale deployment.

Reference:

Gan, C., Zhang, Q., & Mori, T. (2024). Application of LLM Agents in Recruitment: A Novel Framework for Resume Screening. *ArXiv (Cornell University)*. https://doi.org/10.48550/arxiv.2401.08315