

# Application Ranking System

A methodology to rank resumes using contextual understanding  
with the help of LLMs

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## Abstract

Applicant Tracking Systems (ATS) are software solutions used by recruiters to automate and streamline the hiring process. They handle tasks such as resume parsing, keyword matching, and ranking candidates based on job descriptions. ATS adoption has grown significantly, with more than 90% of Fortune 500 companies using these systems to improve efficiency and reduce time-to-hire [1]. Despite their advantages, traditional ATS methods often rely heavily on keyword-based filtering, leading to challenges such as overlooking qualified candidates with nonstandard resumes [2]. This type of resume filtering or resume ranking does not utilize the quantifiable work the candidate has listed on the resume until after the initial shortlist. The goal of here is to build a contextual-based candidate shortlisting system, an Application Ranking System, rather than the current keyword-based approach. By coming up with a formula to score resumes, this approach would not only help in ranking, but also helps in providing closure to the applicants as to why they are not shortlisted.

## Limitations of Current ATS

Traditional ATS implementations focus on keyword-based matching, which encourages applicants to manipulate resumes by overusing keywords. This approach often eliminates potentially suitable candidates who do not strictly adhere to the keywords in the job description [3]. Candidates are often recommended to focus on including keywords listed in job descriptions [4]. Furthermore, manual resume reviews, even when assisted by basic ATS functions, are time-consuming and prone to errors due to unreadable resume formats [3].

## Advancements in Using NLP

There have been incredible advancements in Natural Language Processing (NLP), specifically Large Language Models based on "Transformers" architecture. Despite their incredible power, they are yet to be properly used in the hiring process. These models do not directly understand human language. Therefore, we need to convert human text into embeddings that the model can understand. Sentence-BERT (SBERT), a variant of BERT, has shown promise in generating semantically meaningful sentence embeddings. Sentence transformers like

SBERT can help in improving the current system by comparing candidate qualifications with job descriptions contextually, using similarity and other distance metrics [5]. Research by Vinaya et al. demonstrated that SBERT outperforms traditional BERT models in capturing contextual nuances, leading to more accurate candidate rankings [5].

## Role of Artificial Intelligence in ATS

AI-driven ATS solutions now incorporate machine learning algorithms to predict candidate suitability by assessing their skills, qualifications, experience, etc. These systems analyze structured and unstructured data to identify patterns and optimize the process [1]. Collecting, extracting, and building structured data would help in building a similar model which would be a crucial part of our goal. But, solely depending on machine learning or keywords would not be sufficient.

## Proposed Methodology for Application Ranking Systems

The goal is to combine the predictive capabilities of AI models with the rich contextual understanding provided by sentence transformers. The use of contextual embedding models, such as SBERT, marks a significant advancement in this area [5]. By leveraging large language models and fine-tuning them with domain-specific datasets, we can effectively classify resumes. Integrating these predictions with similarity scores between resumes and job descriptions will create a more robust method for ranking candidates. Additionally, other definitive metrics can be incorporated to develop a scoring mechanism. Ultimately, this Application Ranking System aims to be a greater option for ranking and shortlisting candidates compared to the current keyword-based approach.

## Future Directions

The future of applications lies in the integration of advanced and robust large language models that can understand context, along with AI-driven analytics. Features such as real-time feedback, personalized candidate experiences, and diversity and inclusion metrics will transform recruitment strategies. Additionally, creating a comprehensive pipeline, similar to an Applicant Tracking System (ATS) that tracks applications throughout their life cycle but with the power of understanding context, would significantly enhance the new era of hiring procedures.

## References

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