A Responsible AI Framework for Bias-Free Resume Screening in Human Resource Management.

Sharon Melhi1, Aditya Banerjee1

1 Amity University Bengaluru

Abstract

The integration of artificial intelligence (AI) in human resource management has transformed recruitment, yet risks perpetuating biases embedded in training data or algorithmic design. This paper presents FairHire, an AI-driven framework combining Hugging Face’s dslim/bert-base-NER for named entity recognition and distilgpt2 for report generation to process resumes in Word format. FairHire extracts critical attributes—name, qualifications, experience, and skills—while systematically removing discriminatory factors such as ethnicity, gender, or age, achieving a 98.7% success rate in filtering sensitive information across diverse resume datasets. The extracted data is summarized into a concise, bias-free report for HR evaluation, ensuring merit-based decision-making. Implemented in Python, the model leverages regex-based filtering and natural language processing to align with responsible AI principle Performance tests reveal a 2.1-second processing time per resume and 93.8% entity extraction accuracy, surpassing traditional systems by 35% in fairness metrics. This work advances responsible AI by integrating transparency, privacy, and fairness, offering a scalable solution for global organizations committed to ethical recruitment.

**Keywords: Responsible AI, Bias Mitigation, Resume Screening, Natural Language Processing, Ethical Hiring, Hugging Face, Human Resource Management**