

# ChatGPT with the ScholarAI plugin

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Are there research papers on the subject of using AI to support the work of a recruitment business?

ChatGPT

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Certainly, there are research papers that delve into the subject of using Artificial Intelligence (AI) to support various aspects of business, including recruitment. However, it appears that the focus is often on broader topics such as fairness, clinical decision support, and employer branding. Here are some papers that might be of interest:

## 1. [Assessing the Fairness of AI Systems: AI Practitioners' Processes, Challenges, and Needs for Support](#)

- **Authors:** Michael A. Madaio, Lisa Egede, Hariharan Subramonyam, Jennifer Wortman Vaughan, Hanna M. Wallach
- **Publication Date:** 2021-12-10
- **Cited By:** 55
- **Abstract:** This paper investigates the fairness-related challenges faced by AI practitioners in technology companies. While not directly focused on recruitment, the paper does discuss the role of organizational factors in shaping fairness work, which could be relevant to recruitment businesses.
- [PDF](#)

## 2. [Reporting guideline for the early stage clinical evaluation of decision support systems driven by artificial intelligence: DECIDE-AI](#)

- **Authors:** B. Vasey, M. Nagendran, Bruce Campbell, D. Clifton, and others
- **Publication Date:** 2022-05-18
- **Cited By:** 54
- **Abstract:** This paper provides guidelines for the early-stage clinical evaluation of AI-based decision support systems. While focused on healthcare, the methodology could be adapted for evaluating AI in recruitment.
- [PDF](#)

## 3. [Employer Branding Applied to SMEs: A Pioneering Model Proposal for Attracting and Retaining Talent](#)

- **Authors:** Beatriz Monteiro, V. Santos, Isabel Reis, M. Sampaio, and others
- **Publication Date:** 2020-12-01
- **Cited By:** 17

- **Abstract:** This paper proposes an employer branding model for Small and Medium-sized Enterprises (SMEs) to attract and retain talent. While not directly focused on AI, the model could potentially be enhanced with AI techniques.
- [PDF](#)

Would you like to delve deeper into any of these papers, or would you like me to search for more specific papers related to AI in recruitment?

AL

Please search for papers specific to recruitment

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Certainly, there are research papers that specifically focus on the use of Artificial Intelligence (AI) in the recruitment process. Here are some that may be of interest:

1. [Bias in Multimodal AI: Testbed for Fair Automatic Recruitment](#)

- **Authors:** Alejandro Pena, Ignacio Serna, A. Morales, Julian Fierrez
- **Publication Date:** 2020-04-15
- **Cited By:** 31
- **Abstract:** This paper explores the biases in multimodal AI systems used for recruitment. It proposes a testbed called FairCVtest to study how these algorithms can be affected by sensitive elements like gender and racial biases.
- [PDF](#)

2. [Symbolic AI for XAI: Evaluating LFIT Inductive Programming for Fair and Explainable Automatic Recruitment](#)

- **Authors:** A. Ortega, Julian Fierrez, A. Morales, Zilong Wang, Tony Ribeiro
- **Publication Date:** 2020-12-01
- **Cited By:** 11
- **Abstract:** The paper discusses the use of Inductive Logic Programming (ILP) to provide human-readable explanations for machine learning methods used in fair recruitment.
- [PDF](#)

3. [Does AI Debias Recruitment? Race, Gender, and AI's "Eradication of Difference"](#)

- **Authors:** Eleanor Drage, K. Mackereth
- **Publication Date:** 2022-10-10
- **Cited By:** 10

- **Abstract:** This paper critically examines the claims made by recruitment AI companies about the objectivity and fairness of their systems, especially in relation to gender and race.
- [PDF](#)

#### [4. Mitigating Cognitive Biases in Developing AI-Assisted Recruitment Systems: A Knowledge-Sharing Approach](#)

- **Authors:** M. Soleimani, A. Intezari, D. Pauleen
- **Cited By:** 9
- **Abstract:** The paper discusses the role of knowledge sharing between HR managers and AI developers in mitigating biases in AI-assisted recruitment systems.
- [PDF](#)

Would you like to delve deeper into any of these papers, or perhaps save them for future reference?

AL

Please summarise 2.

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Certainly, the paper titled "Symbolic AI for XAI: Evaluating LFIT Inductive Programming for Fair and Explainable Automatic Recruitment" focuses on the integration of symbolic AI and machine learning to create fair and explainable AI systems for recruitment.

#### **Key Points:**

1. **Importance of White-Box Explanations:** The paper emphasizes the growing need for "white-box" (human-readable) explanations in machine learning systems, especially in sensitive domains like recruitment.
2. **Inductive Logic Programming (ILP):** ILP is a subfield of symbolic AI that learns declarative theories from data. The paper uses Learning from Interpretation Transition (LFIT), an ILP technique, to generate propositional logic theories that are equivalent to a given "black-box" system.
3. **Fair Recruitment:** The authors apply LFIT to create a fair recruitment tool that ranks Curricula Vitae (CVs) and incorporates "soft biometric information" like gender and ethnicity.
4. **Ethical Concerns:** The paper acknowledges that machine learning algorithms can reflect biases present in the data they are trained on. This is particularly problematic in domains like recruitment where ethical behaviour is mandatory.
5. **Logic Programming:** The paper discusses how logic programming, particularly ILP, can offer a high level of abstraction and a formal model to represent human knowledge, making it suitable for generating explanations.

6. **Methodology:** The authors propose a general methodology that uses LFIT to provide accurate, declarative explanations for classic machine learning algorithms. This methodology is tested in a recruitment scenario that includes biases related to gender and ethnicity.
7. **Contributions:** The paper's main contributions are a method for providing declarative explanations using PRIDE (an approximation to GULA, a general LFIT algorithm) and an evaluation of the expressive power of these explanations in a recruitment context.

The paper suggests that LFIT and similar ILP techniques can be effectively used to create more transparent and fair AI systems, particularly in the field of recruitment.

Would you like to know more details or have specific questions about this paper?

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What does the paper say about the 'fair recruitment tool' in particular?

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The paper discusses the development and evaluation of a 'fair recruitment tool' in the context of automatic recruitment algorithms. Here are the key points:

#### **FairCVdb Dataset**

The paper uses a synthetic dataset called FairCVdb, which comprises 24,000 synthetic resume profiles. Each resume includes 12 features related to the candidate's merits, 2 demographic attributes (gender and ethnicity), and a face photograph. The face images were discarded for simplicity in the experiments.

#### **Ethical Considerations**

The domain of automatic recruitment algorithms is highlighted as one requiring ethical behaviour, where no spurious biases are allowed. The synthetic datasets contain resumes used for testing the ability of deep learning approaches to reproduce and remove biases present in the training datasets.

#### **Experiment Scenarios**

The paper outlines various scenarios for the experiments, aiming to reveal biases related to gender and ethnicity. The scenarios range from simple to complex, considering different input attributes like merits, gender, and ethnicity to score each CV automatically using a neural network.

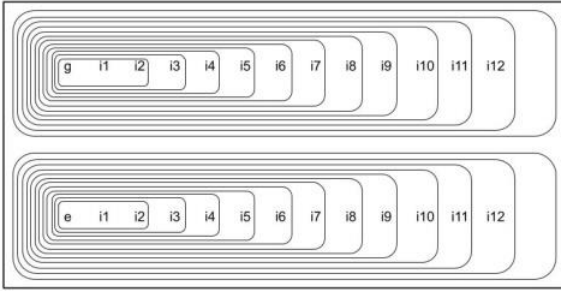


Figure 3: Structure of the experimental tests. There are 4 datasets for analysing gender (named  $g$ ) and ethnicity ( $e$ ) bias separately. Apart from gender and ethnicity there are 12 other input attributes (named from  $i1$  to  $i12$ ). There is a couple of (biased and unbiased) datasets for each one: gender and ethnicity. We have studied the input attributes by increasing complexity starting with  $i1$  and  $i2$  and adding one at each time. So, for each couple we have considered 11 different scenarios (named from  $s1$  to  $s11$ ). This figure shows their structure ( $s_i$  is included in all  $s_j$  for which  $i < j$ ).

in the deep-learning processes. The paper gives a positive answer to both questions.

Would you like to delve deeper into any specific aspect of the fair recruitment tool discussed in the paper?

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Can you give an example of the tools analysis of one scenario?

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Certainly, the paper provides an example of how the tool analyses a specific scenario, referred to as "Scenario 1," which focuses on gender-biased scores.

### Scenario 1: Gender-Biased Scores

In this scenario, the tool takes into account three input attributes for each CV:

- Gender
- Education
- Experience

Declarative Explanation

The tool provides a rule-based, declarative explanation for how a CV is scored in this scenario. For instance, one of the rules states:

- If the value of a CV for the attribute "gender" is 1 (indicating female),
- And the value for "education" is 5 (the highest level),
- And the value for "experience" is 3,

Then this CV receives the highest score of 3.

### Declarative Explanations

The paper aims to provide declarative explanations capable of revealing biases. For example, one of the scenarios (Scenario 1) takes into account the input attributes of gender, education, and experience. The paper shows how a CV is scored based on these attributes, providing a rule-based explanation.

### Main Goals

The main goals of the paper are to evaluate whether PRIDE (an approximation to GULA, a general LFIT algorithm) is expressive enough to explain how the program learnt by deep-learning approaches works and whether it can catch biases

## Purpose

The purpose of this scenario is to evaluate whether the tool can provide a transparent, rule-based explanation for how CVs are scored, particularly in the context of gender biases. The tool aims to reveal any biases in the scoring algorithm and provide a logical explanation for the scores assigned to each CV.

This example demonstrates the tool's ability to provide clear, understandable rules for how CVs are evaluated, making it easier to identify and address any potential biases in the recruitment process.

Would you like to explore further details or have additional questions about this example?

AL

To confirm: the declarative explanation sets out the rules that the tool has concluded, after CVs have been assessed, are being used by the AI?

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Precisely, the declarative explanation serves as a transparent representation of the rules that the AI system has effectively "learned" during its training process. These rules are inferred from the data and are used to score or evaluate CVs. The idea is to make the decision-making process of the AI system understandable and transparent by converting the "black-box" machine learning model into a set of human-readable rules.

In the example from Scenario 1, the rule-based declarative explanation indicates that if a CV has specific attributes—such as being female, having the highest level of education, and a certain level of experience—the CV would receive the highest score of 3. This allows for a clearer understanding of how the AI system is making its decisions and provides an opportunity to scrutinize it for any biases or ethical concerns.

Would you like to delve deeper into any other aspects of this topic?