

Introduction

Job recommendation is a challenging problem:

- **sparse** interactions
- involving vulnerable human beings
- **congestion** avoidance, **fairness** and **privacy** requirements

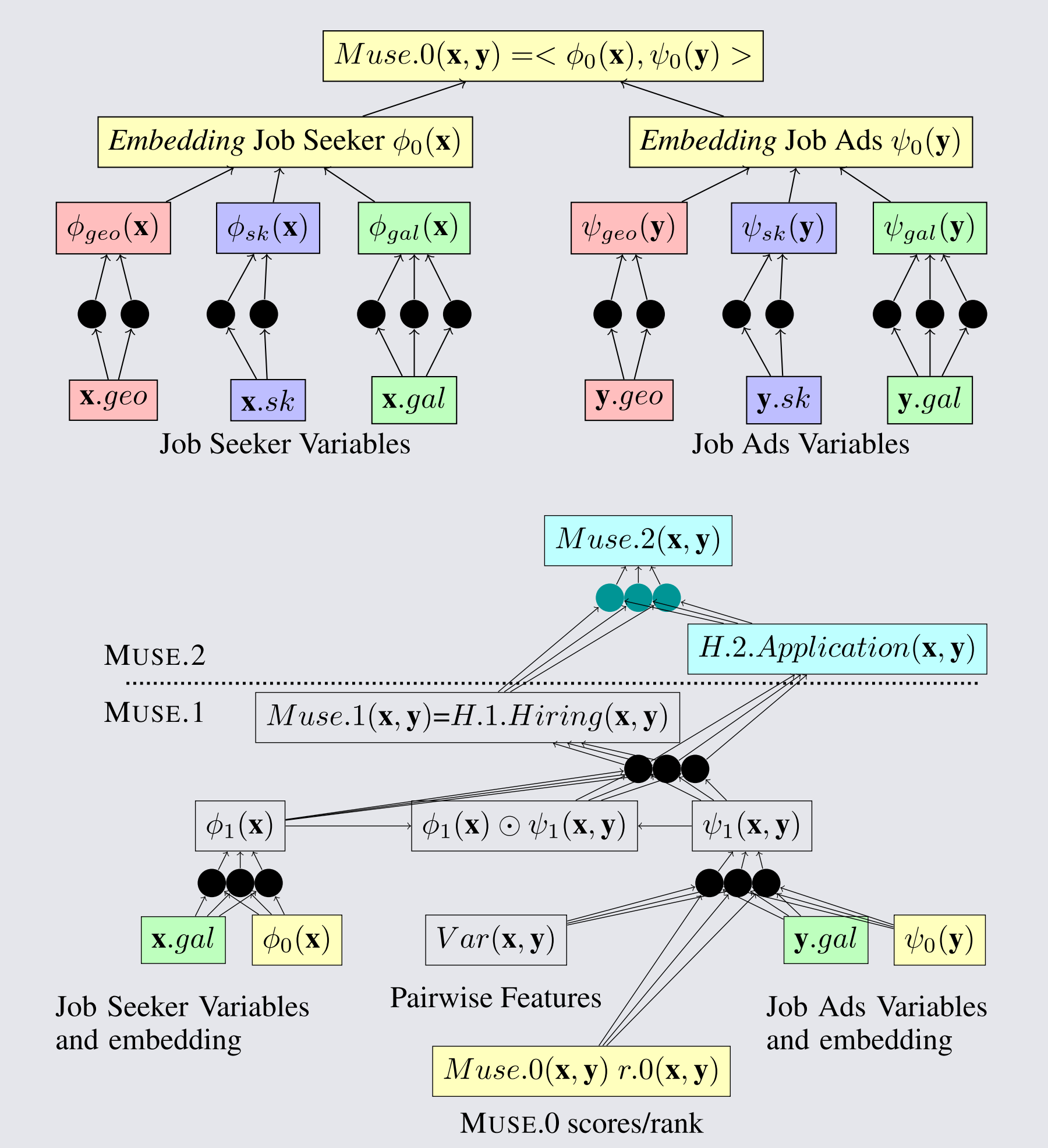
Data

- Data from the Frech **Public Employment Service** (PES)
- 1.2M jobseekers, 2.2M job ads, 242k matches
- Mostly **tabular data** (and text) for job seekers and job ads
- Dimension 500 after preprocessing for both

Proposed approach

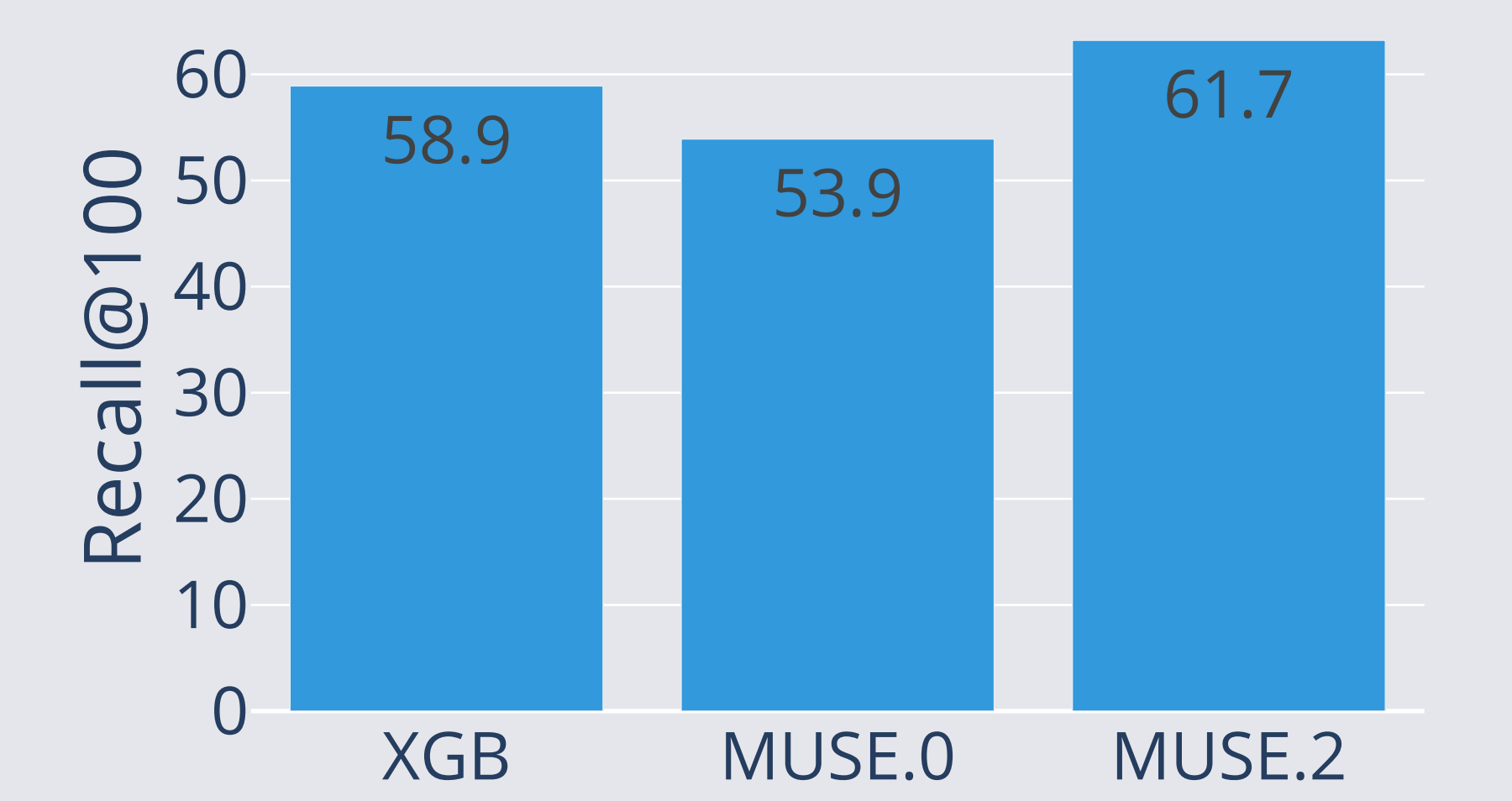
MUSE (MUlti-head Sparse E-recrutement) is a 2-tier neural architecture:

- **MUSE.0** efficiently selects 1000 job ads using the dot product of two learned embeddings
- **MUSE.2** reranks those using more elaborate features and a more expressive model, leveraging both hiring and application data



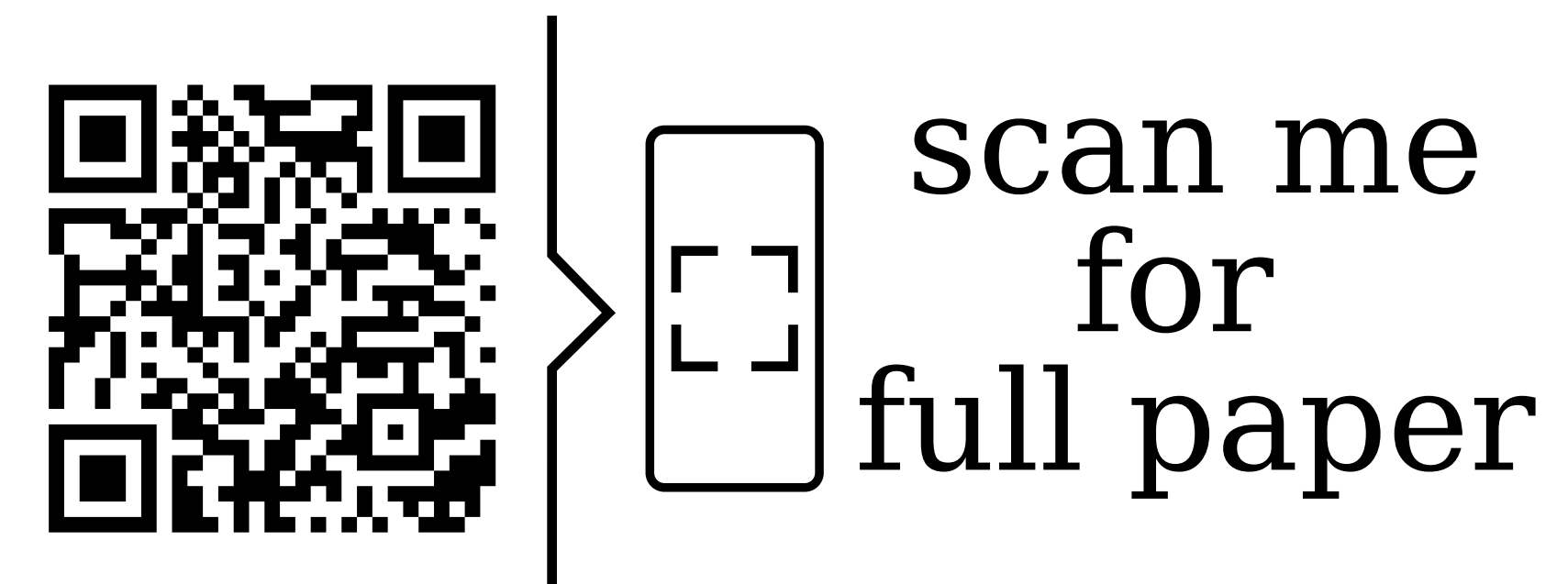
Better

We match or improve Recall@100 compared to XGBoost.



FAST & FAIR

Job Recommendation at 100 Times the Speed. With Feedback From Real Jobseekers!

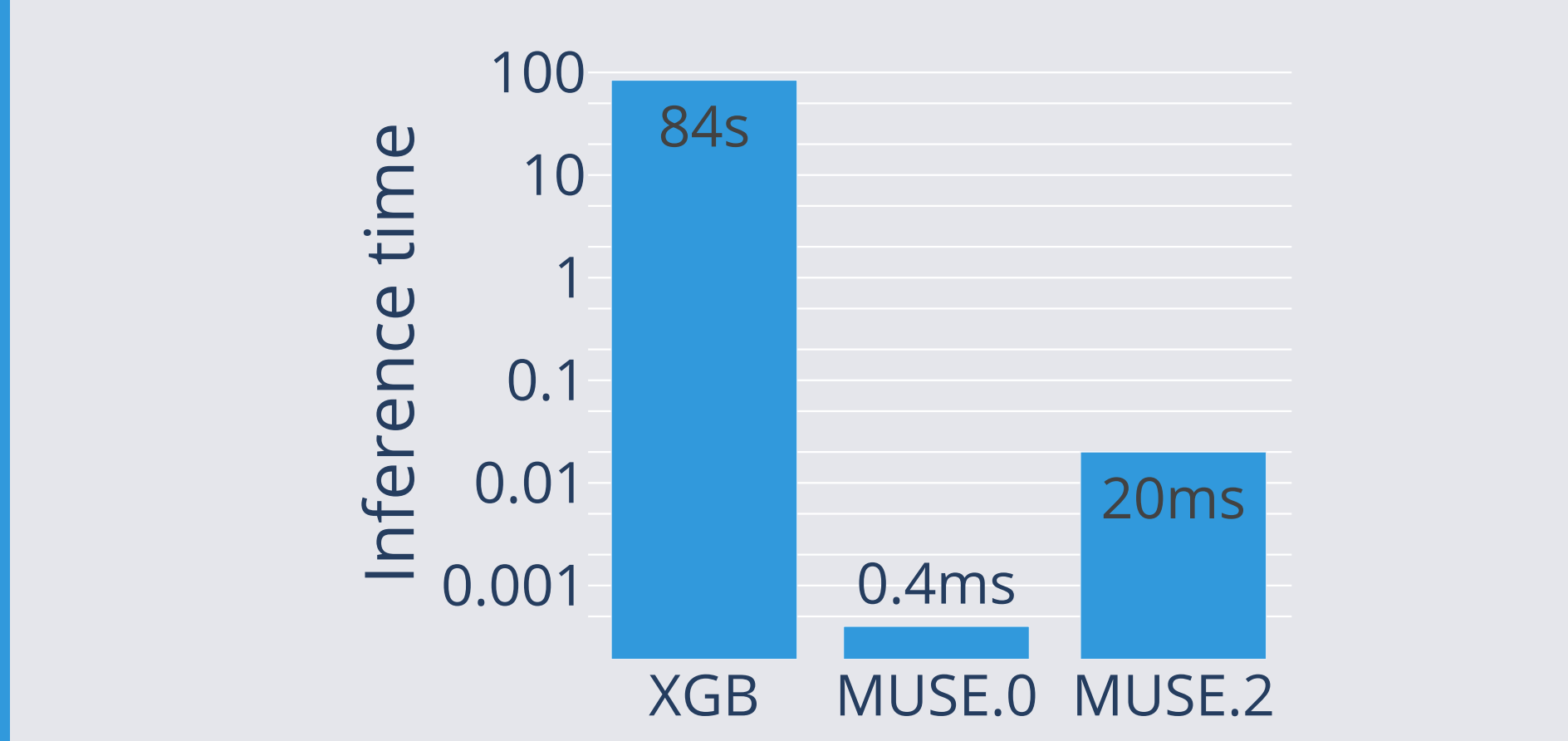


Toward Job Recommendation for All.
Guillaume Bied, Solal Nathan, Elia Perennes, Morgane Hoffmann, Philippe Caillou, Bruno Crépon, Christophe Gaillac, Michèle Sebag.



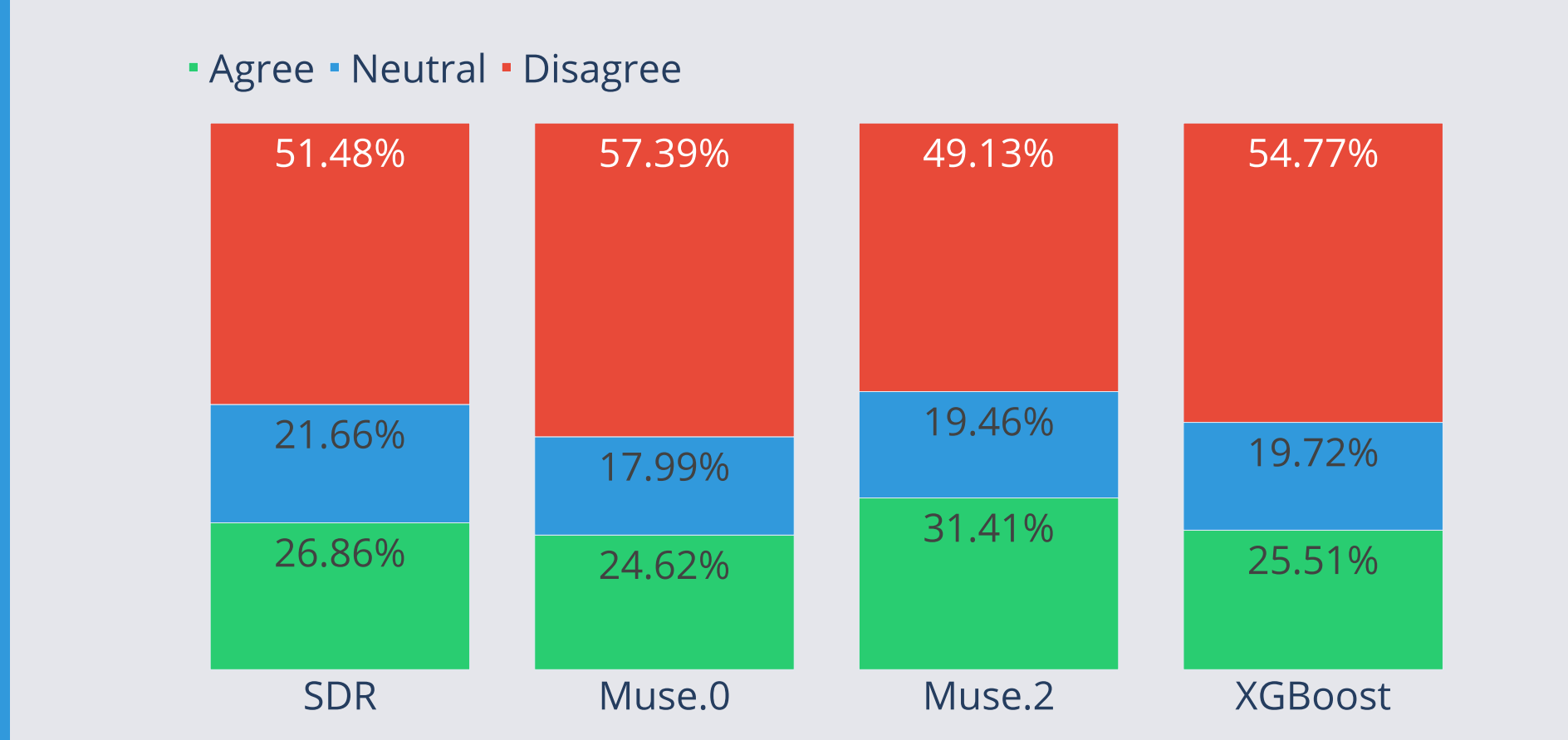
Faster

MUSE.2 is **two orders of magnitude** faster at inference compared to XGBoost.



Stronger

We assessed the **acceptability** and **performance** of our algorithms in large scale **randomized control trials**.



SDR = French PES's current proprietary system

Fairer

We evaluate the **gendered biases** (conditional on jobseekers' search parameters) using **double machine learning**. Our model **reduces or at least does not amplify biases** compared to actual hiring and application data.



Perspectives

- Enhance system **perception of the job market**
- Explore **fairness trade-offs**
- Leverage **large language models** for better text analysis in job ads and resumes