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Connecting Underrepresented Minorities and Qualified Job Positions Using Online Data

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Abstract

Several studies previously demonstrated that underrepresented minority (URM) groups often struggle to access high-qualified jobs. At the same time, a wide range of researches also indicates that diversifying the work environment can bring a very positive impact for the company, in terms of productivity and revenue. However, many companies still fail in filing their positions with diverse candidates. In this research, we aim to investigate the gap between companies offering qualified job opportunities and underrepresented minority groups and attempt to increase the digital connection between them by making the job posting process more attractive and reachable for URMs.

Introduction

Twenty years ago, an analysis by (Richard 2000) concluded that racial diversity affected business strategy by means of increasing productivity, return on equity, and market performance. Since then, several articles and reports have pointed to the social and financial benefits of a more diverse work environment. To name a few, the study by (Boston Consulting Group 2018) found that diverse companies generate 19% more revenue and the report by (McKinsey 2018) concluded that gender diversity in management positions actually increases profitability more than previously thought. Based on these findings, companies started creating efforts to hire in more inclusive ways.

In parallel, access to quality work opportunity becomes a life-changing opportunity for underrepresented minority (URM) groups (be they, Blacks, Latinxs, Native-Americans, LGBTQIA+, low-income individuals, or others). Several are the barriers and hurdles that hinder or even prevent them from accessing as well as reaching higher quality work opportunities. They face hiring biases inherent in the hiring selection processes and data as documented by the HR community elsewhere.

In this context, emerging technologies, in particular AI, can help address hiring URMs (*e.g.,* via algorithms for people-opportunity matching), but they may also exacerbate the existing gap by carrying over historical and social biases inherent in the training data. For instance, referral and selection practices tend to reinforce existing stereotypical gender and race aptitudes, which are learnt by algorithms that ingest hiring historical data and determines who should see hiring openings. In this context, (Hardt, Price, and Srebro 2016) and (Peña et al. 2020) proposed solutions to miti-gate bias for a supervised learning. However, without any correction, job postings, for example, may not be reaching certain groups of people, in particular the underrepresented ones.

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Our Proposal

In this research, we postulate that while the challenge of hiring underrepresented candidates for qualified jobs is manyfold, two aspects are particularly critical and have been greatly affected by emerging AI and social-media technologies in the past years: namely, AI for candidate-job matching and the use of social media for reaching out to target candidates. On the one hand, discriminatory hiring practices as well as implicit biases negatively affect the ability of underrepresented candidate applications to be identified and thus vetted. On the other hand, companies might not even be able to reach out to the most qualified underrepresented candidates or might not be perceived as creating equal and just opportunities for all, thus reducing their attractiveness to URM candidates with the required skill.

Our research goals are to address these two complementary challenges that together undermine the hiring opportunities for underrepresented candidates as well as a company's ability to reach out to them. We aim at taking the first concrete steps toward this vision by exploring both (i) attractiveness and (ii) reach of job postings for URM groups. To this end, this work proposes to investigate and devise an AI-based approach for identifying biased and inhibiting language in job postings and investigating the extent to which such job-postings reach out and eventually influence those URM groups. More specifically, we will investigate and address two main research questions described as follows.

How can technology help bridge the social distance between underrepresented candidates and job-offering companies?

Are URMs being reached by job postings? A certain social group may be involved in local social networks, as described by (Hofstra et al. 2017), that may be cut off from major job advertisement clusters, making some job opportunities unreachable. By analyzing the job posting (social) graph in a social network, we will be able to devise ways to reach different social groups. We will also make use of the social-graph as means to identify and determine specific social group languages and determine the semantic social distance between the social groups of which underrepresented candidates are members and the companies offering qualified jobs. Figure 1 depicts all these aspects of the investigation.

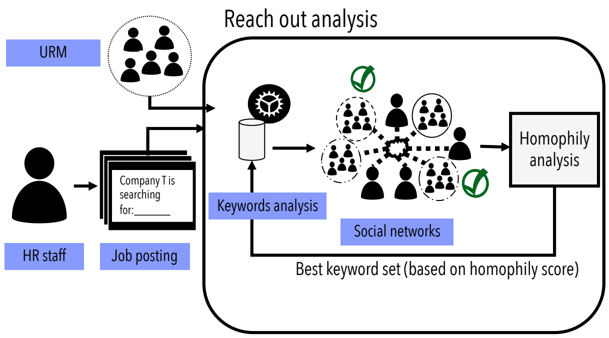

Figure 1: Scheme for reach out URM candidates. The input for this solution would be job posting texts along with the information of the URM group being sought on a social network. The methodology comprises the choice of keywords that assists to define the target audience for the job post, and this audience should be as diverse as possible. This choice will be based on the calculation of the homophily score, which is described in (Karimi et al. 2018).

How do job descriptions drive away underrepresented candidates?

It is well-recognized that particular languages convey specific sets of social values that directly affect how a message might be differently interpreted by distinct social groups. For example, in seeking for a "ninja programmer", which is widely perceived as a male-oriented attribute, a job posting conveys the idea of a male-oriented or male-preferred work environment, thus reducing the likelihood of female programmers to apply for that particular job offering. To what extent does a job posting carry, at times inconspicuously, implicit bias, or structural forms of discriminatory practices? We aim to evaluate AI-based technologies of NLP for automatically flagging biased or discriminatory language in job postings. In creating AI tools that can detect language biases and prejudices, we will be able to devise an overarching solution for supporting more equitable and just hiring practices by recommending more appropriated languages as well as identifying 'hot-spots' of inappropriate job postings. Figure 2 shows in details our proposal for bias detection.

Conclusion

We believe that we have still a lot to advance in science and technology to achieve equitable and just hiring practices. In particular, we think that an approach that assesses and improves the reaching out to underrepresented candidates has potential to improve hiring processes and therefore increase the diversity of the companies' workforce.

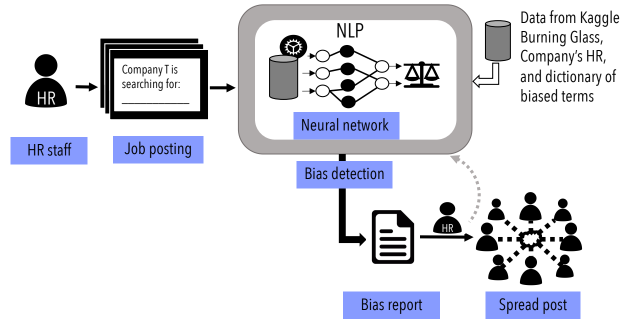

Figure 2: Scheme for bias mitigation in job postings. It starts with an HR member preparing a job post description which will be the input data. The raw text is analyzed by an NLP algorithm that identifies potentially problematic terms or expressions. As training data, a dictionary created from the URM groups reach phase can be used, as well as data from Burning Glass, Kaggle, and the company's HR. The analysis outputs a report of such expressions so that the job posting may be revised by an HR member. The revised job posting may undergo the bias detection until the bias report outputs that the text is OK. Finally, the revised job posting may be spread on social media and other webpages.

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