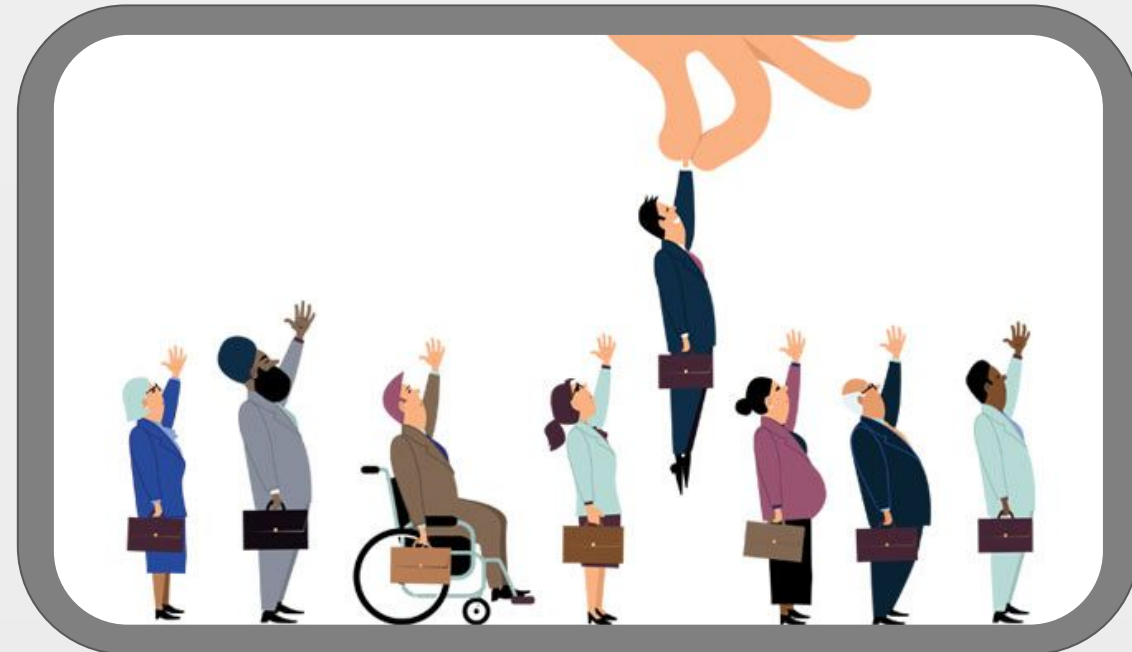


The Problem



Did you know that bias plagues the job recruitment process?

- Current algorithms meant to function without bias commonly inherit the biases of their programmers (Bogen 2019). This results from various issues such as the inclusion of traits like race, gender, nationality, etc. (Das 2018)
- Not all biases are created equal. Area codes and height can lead to unintentional internal bias which causes discrimination. This isn't surprising considering a recruiter looks at a resume for

7 Seconds on Average!

Our Solution

To build our own algorithm!

As five computer science majors, we decided to develop our own application while eliminating as many biased components as possible. While this is a simplified version compared to other algorithms currently in use, our application can be built upon for further improvement.



The program consists of three major components:

- uploading resumes as PDFs
- manually entering resumes
- Entering ideal qualities (as the recruiter)

Bias in Hiring

By Hayden Fargo, Natalie Huante, Chris Isidro, Emma Harper, Diego Lopez Ramos

SCI Project 2022
2020-2022
Bias in AI Group
bit.ly/SCI_Bias_Hiring
Group: Bias in AI

Front Page

A simple, easy to understand layout with easily digestible explanations for even the most tech insecure job recruiters. Only four options are given on the main screen: Upload PDF, New PDF, Add Terms, Quit

Upload PDF

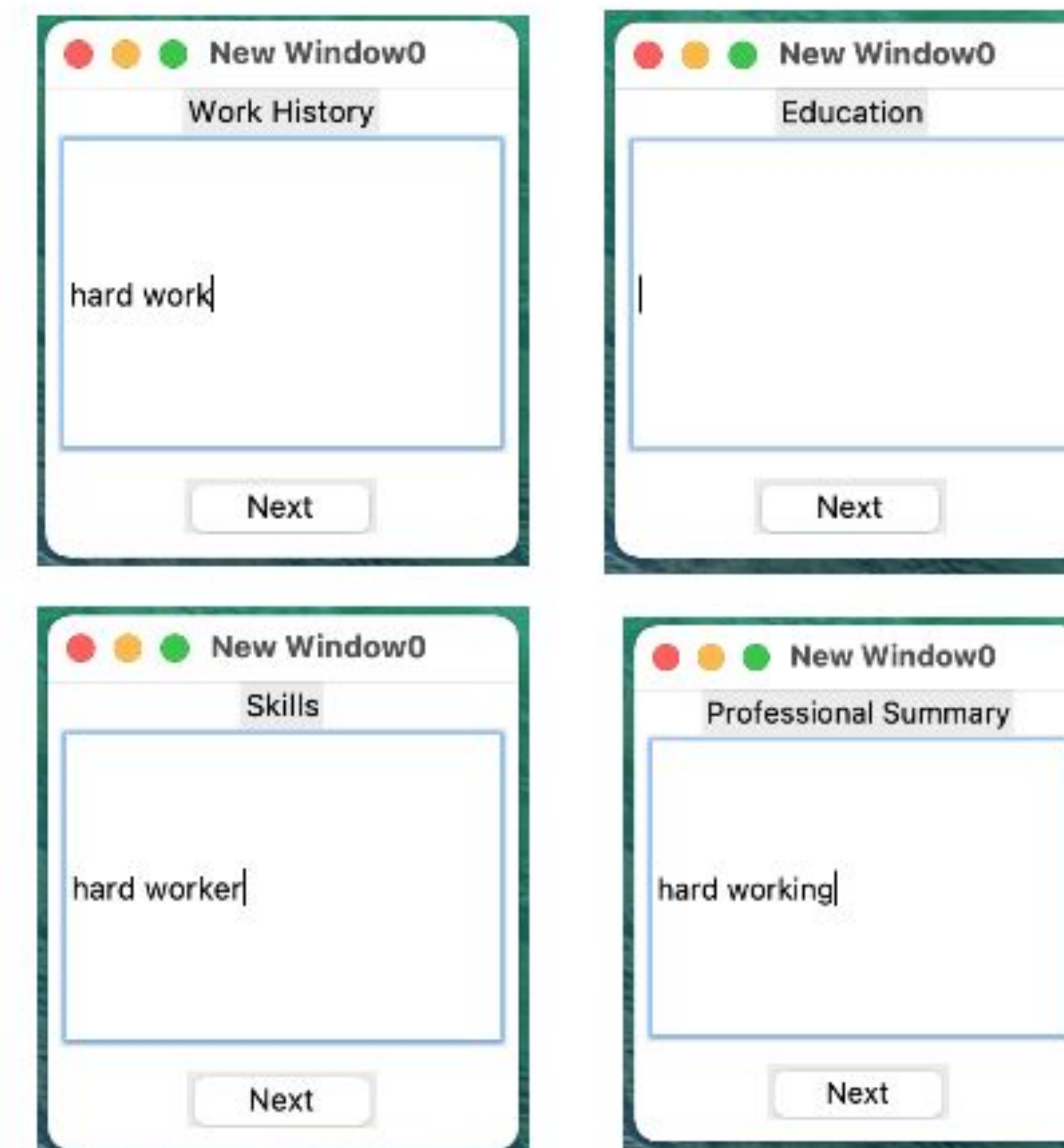
Recruiters can upload resumes of their job applicants in the Upload PDF window by inputting the file path.

Add Terms

Recruiters can add terms or traits that they find desirable in their field along with a sentiment score for each term. For example, a recruiter may believe a program manager is twice as important a skill as a hard worker, so they may give that a score of 2 instead of 1.

New PDF

Some resumes aren't designed well for computer analysis. Recruiters can also input information manually using the New PDF window if necessary.



Results

Our algorithm will then use a combination of word sentiment analysis along with information given such as education, work experience and certifications to sort applications in a non-bias way.

Author Contributions

As a team, we created a breakdown of tasks as follows:

- Hayden: Explore and Research AI models to integrate (Lead Programmer)
- Natalie: QoL Changes / Presentations
- Emma: Research the feasibility / process of integration LinkedIn data into the program
- Chris: Layout / UI Elements
- Diego: Focus on debugging / stepping in wherever needed to take on issues that arise

However, in most cases, we researched and handled progress collaboratively. This often meant that we all were involved in most aspects of the project. This held true more prominently in the research stage, as all of our information gathered tended to overlap and contribute to other's questions and areas of concern.

Development Process

Research Phase

Our team looked at 5 common areas of bias in AI (job applications, facial recognition, medical diagnosis, automated language, and criminal justice. After evaluating the feasibility, difficulty, and our interest in each area we chose bias in hiring. Our focus then shifted to researching in the realm of hiring algorithms.



Github

- Creation of our repository
- Relearning Github management tools and learning new things like Git Issues
- Github is used for the remainder of the process

Integration of Tools

Our main two tools are Tkinter and the PDF reader. Tkinter's is a graphical user interface the visual part of our project. Finding and implementing a PDF reader was tedious but incredibly helpful in making our application feel applicable.



Main Implementation

- Word Processing AI
- Managing UI Layout and Creation
- Creating an Executable for User-Friendly Process
- Addressing Issues / Debugging



LinkedIn

A feature we were looking to add was LinkedIn resume creation for our project. However, due to the LinkedIn vs. hiQ Labs lawsuit, it was impossible to find implementable scraping methods until late April of 2022.

Teamwork

- Created timelines and deadlines
- Constant communication was vital for effective collaboration
- Tasks often overlapped or were shared by members
- Issues in Github used to document areas with need of work



Works Cited

- Bogen, Miranda. "All the Ways Hiring Algorithms Can Introduce Bias." Harvard Business Review, May 30, 2019. <https://hbr.org/2019/05/all-the-ways-hiring-algorithms-can-introduce-bias>.
- Das A, Dantcheva A, Bremond F. Mitigating bias in gender, age and ethnicity classification: A multi-task convolution neural network approach. In: Lecture Notes in Computer Science. <https://towardsdatascience.com/mining-data-on-linkedin-9b70681b1467>
- Document request. AEA Web - American Economic Review - 94(4):991 - Abstract. [accessed 2022 May 9]. <https://pubs.aeaweb.org/doi/pdfplus/10.1257/0002828042002561>
- Ladders I. Ladders updates popular recruiter eye-tracking study with new key insights on how job seekers can improve their resumes. Ladders Updates Popular Recruiter Eye-Tracking Study With New Key Insights on How Job Seekers Can Improve Their Resumes. 2018 Nov 6 [accessed 2022 May 9]. <https://www.prnewswire.com/news-releases/ladders-updates-popular-recruiter-eye-tracking-study-with-new-key-insights-on-how-job-seekers-can-improve-their-resumes-300744217.html>
- Vodinsky S. The courts make it clear: Scraping websites is still legal. Gizmodo. 2022 Apr 19 [accessed 2022 May 9]. <https://gizmodo.com/linkedin-scraping-data-legal-court-case-1848811335>