Gender Bias in AI

By Emmy Keogh

The rapid growth of Artificial Intelligence, commonly referred to as AI, in society in the last few years has propelled humans into a new era– a new age of technology. The last major shift in the technological world was the introduction of iPhones/personal computers, but that was almost fifteen years ago. As a result of the Covid-19 lockdown in 2020, AI was one of the only industries that had increased investment and hirings *(How Has COVID Affected the AI Economy?, n.d.)*. This additional time on our hands allowed tremendous growth in the field, fundamentally changing the way we interact with the world around us. As AI becomes more integrated with our daily lives, from music recommendations to smart cars, it has also raised concerns about gender biases within AI and its effect on the functionality of women's daily life.

AI as an industry is notorious for male-dominated culture that perpetuates gender imbalances leading to skewed representation in almost any product it pushes out. Similar to most other industries, there is an under-representation of women in critical roles. A study by UNESCO found that out of all AI researchers, only 12% are women. Going further, that 12% represents only 6% of software researchers collectively *(Manasi et al., 2023)*. An important question is why there is such a disparity, when reports repetitively highlight girls have equal, if not higher, academic achievement from K-12 *(This Is the Exact Age When Girls Lose Interest in Math and Science - Tinybeans, n.d.)*. One survey taken by young and teen girls in Europe found that the average age of losing interest in STEM is 15 years old. The girls noted that this is because of a lack of STEM-oriented role models, not enough hands-on experience, and the expectation of lower pay compared to men *(Why Don't European Girls like Science or Technology? - Microsoft News Centre Europe, n.d.)*. Consequently, the tech-bro culture was adopted and nourished.

This gap in the work field manifests itself into major biases regarding AI. To clarify, gender bias is when generalizations are made to reinforce the attributes and roles performed and possessed by men and women *(Gender Stereotyping, n.d.)*. Some are less threatening, like assuming women are more nurturing. Other times though, the assumption can cause real life damage. A tangible example is how crash dummies are stylized after men, so more women had injuries in car crashes because the seat belt was designed with the masculine dummy in mind *(AI Bias Could Put Women's Lives At Risk - A Challenge For Regulators, n.d.)*. This source highlights examples of risk using male dominated data to supply the

patterns of code for AI. Pregnant women dummies are rarely used which creates a safety bias. Applying this thinking for AI, if the majority of our data sources are supplied and interpreted by men, then there is an innate bias that will be hard to overcome. This leads to major risks for women, especially in the health data world.

Health monitoring apps are interesting as they are heavily influenced by the skewed health data above. Not only are people allowing companies to track, sell, and analyze “normal” data, but they are allowing these companies to own their private, bodily data. Apps and google searches are already showing bias even when men and women input similar symptoms. Men will be more likely to be shown they are having a heart attack, while a woman's results will say it's depression when citing the same symptoms *(AI Bias Could Put Women’s Lives At Risk - A Challenge For Regulators, n.d.)*.

The physical risks due to gender bias in AI for women should be enough to halt the usage until safer, more equal solutions are discovered. Unfortunately, it does not stop there. Women are affected in their careers, too. An example one study dives into is about Amazon's hiring algorithm. It had AI take applications from the last 10 years and analyze the top qualifications from the applications accepted to decide the best candidates from a recent batch. The algorithm was skewed though as the sample from which the AI was collecting from was male dominated and did not reflect the accurate number of women in the workplace *(Manasi et al., 2023)*. The risk extends to hiring markets and the influence of women in higher paying positions. If AI is in charge, there will be no innovation taking place as a computer cannot judge a candidate like a human can— a computer does not have life experience.

In the same sense, AI can only predict how males and females would react based on biased data. One journal article discusses how AI perceives male and female interactions. For example, one chatbot was more warm when a female AI agent was involved compared to the male AI agent. It goes on to discuss the persuasion techniques that gender influenced AI can use. For example, selling utilitarian products is more successful by a male AI agent, but more hedonic products are sold more successfully through female AI agents *(Ahn et al., 2022)*. This research can be used on how gender stereotyped AI can influence human decisions. And while it is important to understand the nuances involved with why females usually sell hedonic products better than males, it shouldn’t be officially coded into our lives.

One creative take is from an author who states, "Ai is a mirror of ourselves." Which is to say, at the end of the day, the problem is humanity– us. The computers don’t have this innate bias, the humans (mostly men who created the

machines) instilled it in them. An example pulled from Harvard Business Review states that Siri, Alexa, and other AI machines play word associations to stay quick and relevant with the algorithms. Words like doctor are associated with men and nurse with women. This outdated data is only holding us back. This is all a form of repressed representation. For women to google jobs and have the results show lower paying careers just because of the logged data showing results similar to female tendencies is unacceptable *(The Dangers of Tech-Bro AI, n.d.)*. Civilization, especially if we continue down the path of technology that we are on, will not progress.

Almost universally agreed upon is the fact that the majority of all the problems regarding social and gender biases in AI stem from the lack of diverse data in the datasets that the AI pulls from *(Castaneda et al., 2022)*. A key solution to allow diverse data to be accounted for is to let and encourage more women in the programming workplace. More women involved with the development and management of AI will help decrease bias and increase correct data being imported. One journal, deep diving into the development, design, and critique of AI instead of the foundational technology, argues that gender is non-binary and leading with too simple of an algorithm will lead to inconsistencies *(Hall & Ellis, 2023)*. This nuanced take demonstrates the complexity of the situation. It is not black and white, male and female, nor 0s and 1s; it's ever changing opinions, outlooks, and cultural standpoints.

In conclusion, the rapid expansion of AI has thrown us into a new technological era, but it has also exposed the long-standing gender disparities within the AI industry. The underrepresentation of women in AI-related professions, shaped by a tech-bro culture, perpetuates a biased environment that affects both the technology and its impact on society. An insightful hope for the future comes from a blog post suggesting a hippocratic oath for AI, meaning that there should be a legal and ethical document promising to do no hard with the technology surrounding this programming *(aiforgoodstg2, 2020)*. Without women involved in every step of AI development or an oath to keep the people safe, "decades of fights for civil rights and equality [will be] unwritten in a few lines of code" *(Day, n.d.)*. Alas, it's important to remember: AI biases are not at fault from the technology, but rather the humans that built it.

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