



# Gender bias in AI

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## Is the machine about to reverse decades-long gains in gender equality?



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**T**he promise of artificial intelligence as a driver of gender equality is not only difficult to meet but is threatening decades-long gains in gender equality. And while the international development community has only recently stepped up efforts to address bias, the responsibility should trickle down to all stakeholders. The unthinking use of AI in digital health, content creation, conflict analysis, and other areas can no longer be entertained. The human fascination with the machine should be revisited, and there is an urgent need to practice critical vigilance when approaching AI-tagged content and systems.

History has, by and large, been written by men, and the academic curricula of many fields are also put together predominantly by men. Simply put, it is men who, to a large extent, shape the minds of each new generation.

A study published in 2016 found that around 76 percent of 614 books of American popular history reviewed by the researchers had been



written by men<sup>1</sup>. This imbalance is even more pronounced in the Arab region, where history can justifiably be described as womanless – written by men, about men, and in which women, if they feature at all, are portrayed as having played only marginal roles.<sup>2</sup>

This male-dominant history has been challenged recently with attempts by academics at gendering the practice of writing histories. The adoption of a bottom-up reading of history, which focuses on the

**OpenAI CEO Sam Altman speaks during a keynote address announcing ChatGPT integration for Bing. Microsoft's CEO Satya Nadella said the integration will represent what he called a new era for online search. AFP**



perspectives of underrepresented groups, and the emergence of women's memoirs and biographies emphasizing the pivotal role of women as community leaders and even warriors, are examples in that direction.<sup>3</sup>

In 2015, the UN pushed for improved gender equality and diversity across all levels in academia through its HeForShe scheme.<sup>4</sup> In response, the University of Oxford, and nine other leading universities, pledged to achieve gender equality in senior academic and leadership roles by 2030.<sup>5</sup>

Gendering historiography is part of a larger movement mainstreaming gender in many other fields and in society at large. Ultimately, qualitatively, and quantitatively. It also comes at a time when many women are succeeding in breaking through the gender glass ceiling that once served as a barrier to women's advancement in the labor force in many fields.

Digital technology, AI, and machine learning remain fields that are largely dominated by men. In 2019, a UNESCO report found that only 12 percent of AI researchers and 6 percent of software developers were women<sup>6</sup>. Women in digital technologies have started speaking up about the lack of diversity in the

**The inaugural GCC Summit in 1981 was hosted by Shaikh Zayed Bin Sultan Al Nahyan in Abu Dhabi. Experts noted that Arab history has often marginalized women, with their roles being described as peripheral.**

Image Credit: Gulf News Archive

Big Five (Google, Amazon, Apple, Meta, and Microsoft).

In 2020, Timnit Gebru, a top Google scientist working on ethical AI, claimed she was fired after she sent an email to her colleagues to express frustration over gender diversity within Google's AI unit (a claim Google denied.)<sup>7</sup> Meta's 2022 Diversity Report showed that even though women represented 37.1 percent of its global workforce, the percentage dropped to a quarter in tech-specific roles.<sup>8</sup>

Such data shows that women are largely underrepresented in computing, digital information technology, engineering, mathematics, and physics. This was underscored by UNESCO's 2019 report, titled "I'd blush if I could," a reference to how Apple's female-gendered voice assistant Siri was programmed to respond to sexist abuse by male users.

The publication shed light on the danger of having new technologies conceptualized and implemented by all-male teams and served as a challenging reality check that was difficult for the leading actors in the global development community to dismiss. At a time when digitalization as an engine for human development was being emphasized

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and the role of the machine in accelerating innovative and green growth was being celebrated, the advocates of this technology found themselves in a difficult situation. The promise of technology as a driver of gender equality – a promise made often back then – proved difficult to meet, and it was time to act.

In March 2023, as part of its annual review of gender equality, the UN Commission on the Status of Women addressed innovation and technological change and warned of inherent gender inequities in the technology landscape. It “noted with concern the underrepresentation of women and girls, and the lack of or limited participation of women and, as appropriate, girls in the conceptualization, development, implementation and use of digital technologies, as well as the use and production of imbalanced and non-representative data, which can lead to inaccuracies and biases in algorithms.”<sup>9</sup>

One may ask why the underrepresentation of women in technology need matter. Can men be gender-sensitive and mindful of what women need? Apparently not.

The underrepresentation of women in technology is causing gender bias in AI at many stages, such as in the algorithm

development process, in datasets training and, consequently, in development and business outcomes. The bias is alarming in natural-language processing models, where computer programs are trained using datasets and online content that is produced largely by men, reflecting a male perspective on gender-sensitive issues such as digital health (both physical and mental), violence and security, poverty, employment conditions, and consumption patterns.

A basic but flagrant case is the the doctor is a man and the nurse a woman cliché, which generative AI-powered tools are reinforcing, as shown by recurrent experimentation.<sup>10</sup> Until recently, Google image searches of certain professions and positions, such as CEO, yielded photos of men. Titled “Humans are biased. Generative AI is even worse,” research conducted by Bloomberg Technology showed that even though 39 percent of doctors in the US were women, only 7 percent of the images generated were of women. A similar gender imbalance applies to images generated for the word judge, which results in only a 3 percent share for women, even though they account for 34 percent of this category.<sup>11</sup>

The danger of this bias is that it does not

**King Abdullah University of Science and Technology’s “Dear AI” campaign was launched in March 2023 to tackle gender bias and under-representation of women in AI software. KUST**

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at first. Rather, and part of doing process mistakes that will better. But at what is paying?

It is a cost that women are paying, and it is a cost that will reverse development gains in gender equality. And the cost is not only high but can also be fatal.

A study in 2022 by researchers at University College London found that AI models developed to predict liver disease from blood tests were twice as likely to miss disease in women than in men, and that the two algorithms judged to be best at screening for disease overall had the biggest gender gaps. The researchers also looked at 30 studies that had presented algorithms for screening liver disease, and not one had even discussed gender differences. Such AI algorithms, the authors cautioned, should be investigated for bias, otherwise they may leave women with worse care than men.<sup>12</sup>

Another area that should be approached with caution is the use of AI in mental health and psychological diagnosis, using AI-powered sentiment analysis tools that are combined with natural-language processing

**Nassr's forward Cristiano Ronaldo and former Portland Thorns' Christine Sinclair. The Canadian forward, despite biased internet claims, has outscored Ronaldo, securing the top spot for the most goals in international football. AFP**

models. Scientists have built models that analyze human emotions based on written text, but the results have not been very promising. A study that looked at the use of AI in mental health diagnoses called on health professionals and data scientists to “ensure that historic health disparities are not encoded into the future.” Research has shown that when women present with the same symptoms as men, their condition is more likely to be dismissed as psychosocial, placing women at greater risk of adverse outcomes from conditions including cardiac events.<sup>13</sup>

A third area that is using AI-powered content extensively is consumer behavior analysis, marketing, and advertising, and as a result there is a risk of gender bias. Gender stereotypes in communications, advertising, and product design is the result of training the machine on content, usually online, that is more likely to be generated by men, given that internet access is generally greater among the male population<sup>14</sup>. Gender disparity on the internet was much higher in 2018, when 327 million fewer women than men owned a smartphone.<sup>15</sup> What this means is that AI-powered applications such as ChatGPT were trained on online content accessed during a period of higher gender disparity. In other

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words, the internet itself discriminates against women and cannot be regarded as a neutral resource for training AI. In January 2023, the Correct the Internet campaign was launched to show not only that the internet does not give visibility to sportswomen, but that it gives wrong answers when it comes to their achievements. In the campaign's promotional video, a young girl asks the internet about which football player has scored the most goals in international football. The incorrect response is Cristiano Ronaldo, overlooking Christine Sinclair who outscored Ronaldo with her 190 goals.<sup>16</sup>

A fourth area is AI-powered disinformation that stimulates verbal and physical violence and threatens peacebuilding and conflict mitigation efforts. According to Freedom House's report Freedom of the Net 2023, data from 70 countries showed that malicious actors used AI to distort information in 16 countries, and that gendered disinformation "framing women as trustworthy, unintelligent, unlikable, or uncontrollable" was widespread.<sup>17</sup> UN Women refers to these tactics as technology facilitated gender-based

**Iraqi women rally in Baghdad, protesting the tragic killing of YouTuber Tiba al-Ali by her father. Her death highlighted ongoing concerns about 'honour killings' in the country, sparking widespread outrage. AFP**

violence.<sup>18</sup> A quantitative survey covering eight Arab countries found that nearly half of female internet users reported feeling unsafe because of online harassment.<sup>19</sup>

What is worrying is that gender bias has been under-detected and under-reported for so long, regarded as a topic that concerns only scientists and the intelligentsia. There is little public awareness about its multi-level implications and how it affects the lives of women, even among those who present themselves as tech-savvy and ahead of the curve. This applies also to media outlets and content creators using generative AI, and big companies that are designing products using AI-driven insights.

This lack of awareness is of course not intentional. It is a byproduct of the human-machine relationship, in which humans are fascinated by the machine and perceive it as flawless. This was apparent in the first wave of reactions to the emergence of ChatGPT. Typing ChatGPT and flawless into a search engine produces an endless list of articles discussing how good the AI is at writing funding proposals, pharmaceutical

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Timnit Gebru attends "The Bloomberg 50" celebration in New York City. The computer scientist and activist claimed she was fired from Google after expressing frustration over gender diversity within its AI unit. AFP

prescriptions, academic dissertations, and so on. To most university students and many professors, who know little about AI's inherent flaws, ChatGPT appears to be better than them.

This uncritical fascination with the machine will end up with the machine achieving the opposite of what it is supposed to do – i.e., steer the world toward a brighter future. Perhaps what is needed at this stage is more emphasis on the flaws of the machine, including its gender bias, and less mythologizing of the technology.<sup>20</sup>

This is not to call for a tech pause. Correcting the flaws of the internet and machine learning can happen only by extensively using all the tools at hand and engaging in an iterative process of learning, relearning, and passing on what has been (re)learned. Knowledge production itself is becoming an iterative process, and online communities are no longer mere passive recipients of information. It is initiatives such as Dear AI of King Abdullah University of Science and Technology, that was launched in March 2023 to address gender bias and under-

representation of women in AI software, that ultimately will make a difference.<sup>21</sup>

Policymakers and tech companies need to develop binding strategies to enhance representation of women in digital technology and AI. For example, in 2020 the European Commission issued a white paper on AI, proposing a policy framework to increase the number of women trained and employed in this area and to actively address discrimination against women by AI systems.<sup>22</sup> Content creators should also stop perceiving AI-powered outputs with blind admiration, marveling at how speedy content creation is becoming, while dismissing its less impressive downsides. And this responsibility should be shared equally with those seeking to invest in content creation.

Practicing mindfulness and critical vigilance at the sight of AI-tagged content is a duty for all. None of us should be too intimidated to ask, "what did the internet/tech/AI fail to capture?"

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