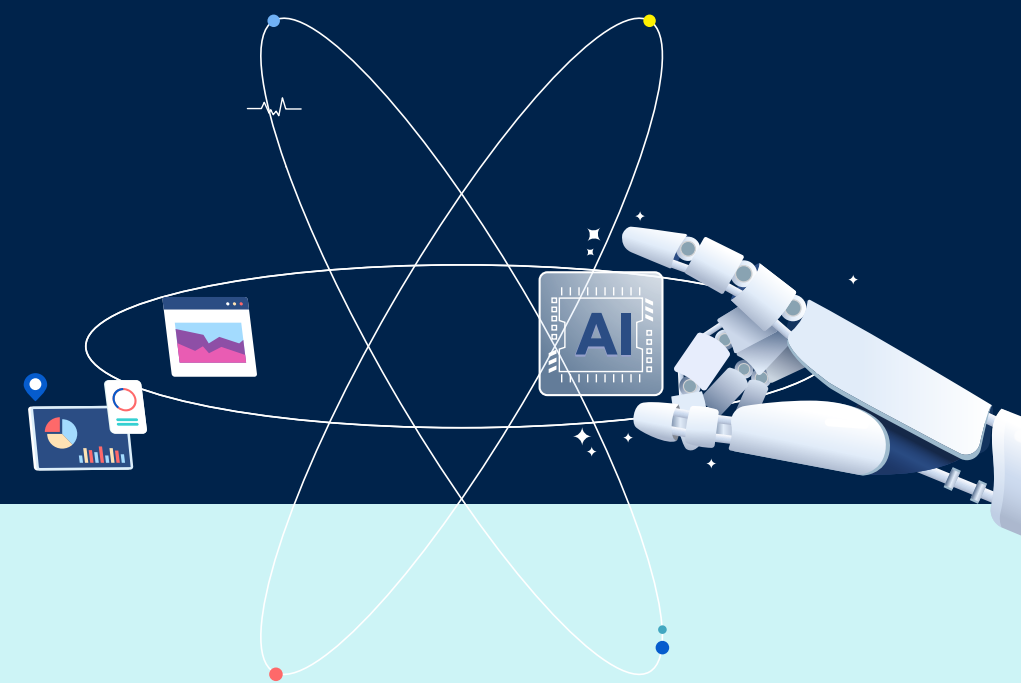It Is Never Safe to Ignore

the Gender Bias in
Artificial Intelligence!

Gender Bias in Artificial Intelligence

There are growing concerns over the recent issues and problems related to artificial intelligence(AI) which reflects and deepens the existing social discrimination.

The gender bias of artificial intelligence originates from our ungrounded belief that machines will not be as biased as human beings.
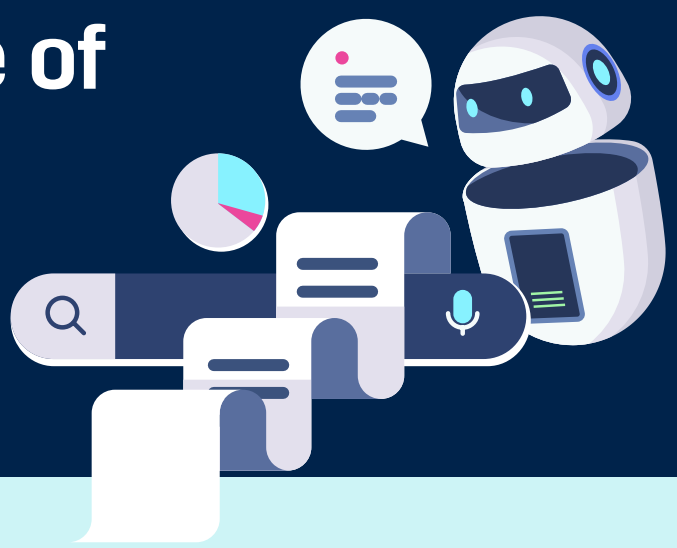
● Gender Bias in Artificial Intelligence ●

Artificial intelligence utilizes a massive volume of data for learning, and creates results based on its learning in a much shorter time than humans.

However, it is difficult for humans to accurately understand how the AI delivers such results based on which evidence. It is not easy for the general public to access such information either.

Cases of Gender Bias

According to our research, gender bias takes place in the entire AI architecture. The research results confirmed that it is necessary to develop useful tools to consider and reduce gender bias at each stage of AI-driven technology development.

Case 1 Gender bias in artificial intelligence by type of technology development

AI planning and designing	
Gendered AI	AI assistants and social robots with female voice and female image show an attitude that is accommodative of sexual harassment.
Intention to commit and monetize sexual exploitation combined with AI technology	Develop an AI algorithm to track the identity of a woman in pornography, by using deep fake technology.
Gender target research	Research a face recognition algorithm to identify sexual orientation of a person simply based on his/her face image.
Data processing	
Bias in the data itself	If gender-neutral or feminine words are automatically set or embedded to be translated to masculine words in the language processing domain including machine translation, then the automatic data-labeling or automatic image-generating algorithm delivers results biased in gender.
Gender bias in setting up the data collection samples	There is a gap in the face recognition rate between white males and black women in the face recognition program. Healthcare data is biased towards male group.

Cases of Gender Bias

According to our research results, the accumulated historical/ structural gender bias and its impact as well as the overall tech industries and society, which do not perceive gender bias as an important challenge, make it fundamentally difficult to improve the current situation.

Case 2 Gender bias in artificial intelligence by type of technology development

Modelling including algorithm generation and learning	
Algorithm designed in a way that does not consider the negative gender bias issues and their improvement	There is a gender gap in the exposure to 'STEM'(Science, Technology, Engineering, Math) career development advertising. Train the computer vision model in a way to strengthen the traditional gender stereotypes.
Algorithm machine learning based on the data with gender bias	There is a gender gap in the exposure to the advertising of high−wage job posting, which was concentrated to men.
Algorithm machine learning	Unconditionally deduct the points for the keywords related to women in the AI hiring process.
Challenges in ensuring transparency or explainability of the algorithm	Assign a lower credit limit to the woman who jointly holds the property with her husband. When searching for keywords related to women of color, the search results show overly large amount of suggestive content (appearing on the top of the page).

Korea

AI-related laws, regulations and policies suggest that there should be no discrimination or bias in every stage of artificial intelligence technology development. However, most of the legislations do not have an explicit provision about gender bias in AI.
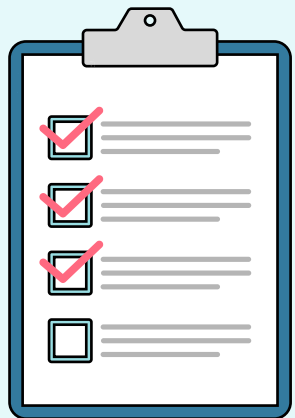
International community 🌐

Meanwhile, international organizations including the OECD, EU, and UNESCO emphasize that each country should prepare a recommendation on the ethics of artificial intelligence so that they could ensure reliability in the development/utilization of AI technologies by considering AI ethics. Some of the major countries overseas have established a legislation that gender bias should be considered in the transparent assessment and disclosure of AI's impact on sexual discrimination.
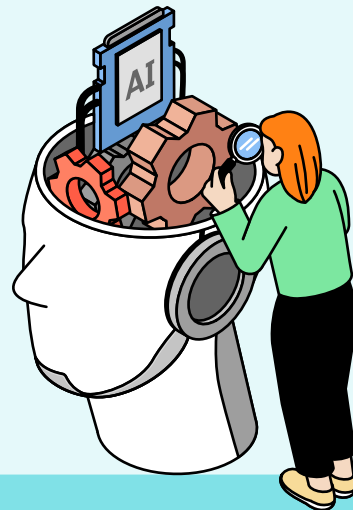
Improvement in the Technology Development Process

Since gender bias could happen at each stage of AI technology development, a technical guideline should be prepared to consider the issues of gender bias in the entire technology development process.

1

Develop and disseminate a gender bias checklist from AI ethics perspective.

2

Develop and disseminate a guideline for engineers to reduce gender bias in the process of AI technology development.

3

Develop and disseminate a guideline for developers and technicians to alleviate gender bias in all AI technologies.

Improvement in Non-Technology Development Process

Gender bias in AI has its fundamental origin in the gender stereotypes and sexual discrimination in our society. Therefore, efforts are needed to perceive AI's gender bias as a challenge faced by the entire society, create a social environment to reduce gender bias, and to improve the relevant laws and regulations.

Artificial intelligence planning and designing stages

(1) Specify the consideration of gender in the basic principles of the Framework Act on Intelligent Informatization (Article 3).
(2) Specify gender impact assessment in the Framework Act on Intelligent Informatization (Article 56).
(3) Include a provision that prohibits gender bias in the AI Ethical Impact Assessment.
(4) Create and operate an AI ethics review board from gender perspectives.
(5) Operate an AI gender bias monitoring group at government level.
(6) Legislate the criteria for verification of gender bias in data and algorithm.

Creation of social environment

(1) Implement education on AI ethics and gender bias.
(2) Nurture women talents and support their career development in the areas of AI technologies and basic science.

For more details, please refer
to the Korean Women's Development Institute
Website – Publications & Issues – KWDI Brief.

KWDI