



European
Commission

GENDER & INTERSECTIONAL BIAS IN ARTIFICIAL INTELLIGENCE

EUROPE FIT FOR THE
DIGITAL AGE



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Digital transformation and artificial intelligence (AI) are an integral part of the 4th Industrial Revolution, transforming our jobs and lives. But, while AI could well be a key driver for innovation, there are challenges and risks that cannot be ignored. This is why the Commission's White Paper on AI stresses the importance of building an AI 'ecosystem of trust' with 'rules that put people at the centre', as President von der Leyen stated in her 2020 State of the Union address.

DID YOU KNOW THAT:

- ◆ **Facial recognition systems perform better on men's faces than on women's, and on lighter skin than darker skin?** Error rates vary from 35% for darker-skinned women, to 12% for darker-skinned men, 7% for lighter-skinned women, and less than 1% for lighter-skinned men. So, these systems need to be checked for bias and the people operating them trained accordingly¹.
- ◆ **Virtual assistants (e.g. chatbots) are often subjected to sexual harassment?** Virtual assistants, e.g. Siri and Alexa, are usually programmed to respond to harassment with flirty, apologetic or deflecting responses. Research suggests that such responses perpetuate the stereotype of subservient women in service roles and may promote a culture of violence against women by presenting indirect ambiguity as a valid response to harassment. To address this issue, some companies have started developing software that is less tolerant of abuse².
- ◆ **Women are more likely to feel unwell when using virtual reality (VR), a technique which can be enhanced by AI?** The symptoms experienced include i) pallor, ii) sweating, iii) increased heart rate, iv) drowsiness, v) disorientation and vi) general discomfort. So, it is important to test VR technologies on women, as well as men, and to promote gender balance in teams developing and designing VR and AI applications³.

¹ <http://gendershades.org> ; <http://proceedings.mlr.press/v81/buolamwini18a/buolamwini18a.pdf>

² <https://qz.com/911681/we-tested-apples-siri-amazon-echos-alexa-microsofts-cortana-and-googles-google-home-to-see-which-personal-assistant-bots-stand-up-for-themselves-in-the-face-of-sexual-harassment> ; <http://dx.doi.org/10.2139/ssrn.3281807>

³ <https://www.eelke.com/pubs/FemaleVR.pdf>

WHY IMPROVING DIVERSITY AND DECREASING BIAS MATTER IN AI

Case studies documented by the EU funded [H2020 expert group 'Gendered Innovations'](#) show that if AI is not developed in a bias-sensitive way, it could exacerbate existing stereotypes and biases, and increase their negative economic and social consequences.

Stronger inclusion of **sex, gender** and **intersecting factors** (see below) in research and innovation leads to:

- added value of research in terms of excellence, creativity and business opportunities;
- an in-depth understanding of people's needs, behaviours and attitudes;
- more societal relevance for AI;
- goods and services being better suited to everyone's needs.

Such an inclusive approach is crucial to secure Europe's leadership in science & technology and support social fairness and prosperity.

INTERSECTIONAL FACTORS

As well as gender and sex, there are other, interconnected factors affecting bias, such as ethnicity, age, socioeconomic status, sexual orientation, geographic location and disability. These all shape a person's or a group's experience and social opportunities, thereby influencing the form of discrimination and inequality they encounter.

POLICY RECOMMENDATIONS



AI systems

1. Embed a bias recognition and 'ethics by design' approach for AI systems.
2. Ensure researchers and auditors can access AI systems to understand the design choices that informed their development, thus helping them to engage the public and affected communities during the AI process.
3. Ensure the highest standards of inclusiveness and equality when procuring AI systems for the public sector.
4. Promote diversity among AI development teams and companies, via specific calls, mentorship programmes and communities of best practice.



Research & Innovation

1. Promote multi-disciplinary research, pilot projects, experiments, and training to identify gender and intersectional biases in AI, as well as awareness-raising campaigns for the general public.
2. Invest more in research on how the intersections of gender, ethnicity and racial origin, and other identities and attributes shape people's experiences with AI.
3. Increase the pool of cross-discipline expertise on gender equality, ethics and discrimination.
4. Provide training in sex, gender, and intersectional analysis to strengthen researchers' and innovators' skills.



Education & Skills

1. Develop an interdisciplinary curriculum for computer scientists and computer engineers that embeds ethics and social issues in core technical courses.
2. Promote a more rounded, inclusive and engaging aspect to STEM by introducing arts and humanities (STEAM).
3. Equip school teachers with a basic understanding of AI and its ethical implications and continue to do so throughout their careers.
4. Ensure right resources, including devices, connectivity and software for digital and distance learning. Pay particular attention to vulnerable and marginalised groups.

WANT TO LEARN MORE...

[Horizon 2020 Expert Group Gendered Innovations Gender equality in research and innovation policy Impact of sex and gender in the COVID-19 pandemic](#)

OTHER LINKS:

[AI Research and Innovation webpage](#)
[Priorities 2019-2024: A Europe fit for the digital age](#)
[The European Commission's approach on AI](#)
[EU Anti-racism Action Plan 2020-2025](#)