



Our voices ■ Our choices

Inclusion Scotland Solutions Series -

Disabled people's rights in an Artificial Intelligence world -

An Overview

This document gives an overview of disabled people's rights in an Artificial Intelligence (AI) world, the barriers AI creates and its potential to support disabled people.

The content of this overview was researched and produced by Inclusion Scotland to support a Solutions Series think tank event in September 2023 and other discussions. We have published this overview to share more of our learning with disabled people, policy and decision makers, regulators, and services who use AI to inform and to advance action. You can read the report of Inclusion Scotland's Solutions Series on our website [here](#). This overview

Disabled people have rights. Where AI is used, it should serve to protect and progress these rights and not infringe them.

Inclusion Scotland acknowledges that it does not have expert knowledge of AI, its application, the regulatory framework, and the outcomes of its use.

1. AI, a brief overview

AI began developing in the 1960s but the so-called ‘AI revolution’ took off in the 2000’s with the combination of increased computing capability, a faster internet, and access to larger data sets. AI is now seen as a major part of our future economies and the provision of public services. Therefore, governments, as well as technology companies, have invested heavily in this area of computer science.

There is no single universal definition of artificial intelligence¹ but it can be summarised as “the science of making machines smart.” The Scottish AI strategy defines AI as:

‘Technologies used to allow computers to perform tasks that would otherwise require human intelligence, such as visual perception, speech recognition, and language translation.’²

The core idea is that machines might be made to work in the same or a similar way to humans, only faster, better, and more reliably and, theoretically, without human bias.

In many cases, this involves an initial assessment of a so-called training set of data to create instructions known as algorithms. Subsequently, the machine analyses data obtained from different sources, such as sensors, records, or scanners, by reference to its own “learning” about the patterns in the original training set.

The decisions the machine reaches may be self-activating as “automated decision-making” or may yield information for a human actor to make a decision and act on themselves.

AI, automated decision-making, and machine-learning technologies are rapidly changing the world. As with previous technological revolutions, these technologies are resetting the terms of human coexistence.

Some see AI as the end of human control over machines. Others view it as the technology that will help humanity address some of its most pressing problems.

¹ See Council of Europe, “What’s AI? A definition uneasy to build and share”.

²Scotland’s Artificial Intelligence Strategy Trustworthy, Ethical and Inclusive March 2021

https://static1.squarespace.com/static/62cd519a0b49ae6dcee5dc8c/t/62d80552ad77dc084206e679/1658324316824/Scotlands_AI_Strategy_Web_updated_single_page_aps.pdf

Whilst neither of these descriptions may be entirely accurate the use of AI-driven technologies being deployed by both public and private actors in numerous ways and across many domains are reaching all spheres of life. As such, artificial intelligence has been described as humanity's biggest challenge³.

Automated decision-making processes are now being deployed in selection procedures for recruitment and higher education; they are used to evaluate our creditworthiness; determine our entitlement to social security benefits; indicate where a burglary is likely to take place; or whether someone is at risk of cancer. AI now determines the information that is made available on social media in our personalised newsfeeds or on the internet in our search engine results; they define who is targeted by political and other advertising and by what online messages.

Regulation and governance of AI, and public and organisational awareness of this, have not fully kept pace with development and rollout. In March 2023, the UK Government launched a consultation on its White Paper⁴, offering what is termed a 'pro-innovation' approach. The Equality and Human Rights Commission (EHRC) has commented, saying that the proposals are 'inadequate.'

Guidance does exist. The EHRC produced guidance for public bodies around the procurement and use of AI by public bodies and their Public Sector Equality Duties⁵. Likewise, the Information Commissioner's Office and the Alan Turing Institute have produced guidance on the requirements of the General Data Protection Regulation and the Data Protection Act⁶.

2. AI and disabled people's rights

How different technologies can affect fundamental rights, particularly for disabled people has not received the attention it needs, and what there is does not universally take account of the legacy of discrimination and

³ See Henry A. Kissinger, Eric Schmidt and Daniel Huttenlocher, *The Age of AI and our Human Future* (London, John Murray Press, 2021); and Sue Halpern, "The human costs of AI", *New York Review of Books*, 21 October 2021.

⁴ UK Government - <https://www.gov.uk/government/publications/ai-regulation-a-pro-innovation-approach>

⁵ Equality Human Rights Commission - <https://www.equalityhumanrights.com/en/advice-and-guidance/artificial-intelligence-public-services>.

⁶ ICO and Alan Turing Institute. <https://ico.org.uk/media/for-organisations/uk-gdpr-guidance-and-resources/artificial-intelligence/explaining-decisions-made-with-artificial-intelligence-1-0.pdf>

unequal outcomes disabled people carry. To date, we do not yet have a suitable body of empirical evidence about the wide range of AI rights implications for disabled people, or about the effectiveness of the safeguards in place (and still needed) to ensure that the use of AI complies with fundamental rights in practice⁷.

As with all society, there are and will be benefits and risks for disabled people. This section examines both.

a. The benefits of AI for disabled people

The upheaval caused by the Coronavirus pandemic, alongside relevant wider societal and technological changes, has seen an increase in the time many of us are spending online, and consequently in our engagement with AI-enabled digital devices.

The benefits of better and faster health diagnosis, plus opportunities for study, qualifications, and employment for disabled people (in the AI and wider Science, Technology, Engineering, and Mathematics (STEM) sectors) go alongside the practical opportunities.

As reported by The Royal Society, the declaration of disability by students studying STEM subjects is rising, and an increase of students diagnosed and identifying as neurodiverse and with mental ill-health. However, the same paper reported that this is not the case for those teaching STEM subjects in Higher Education establishments (3.8% in 2018/19)⁸. The accessible nature of the work may also be a factor.

In terms of employment opportunities, the pandemic and subsequent moves to remote working and remote participation have brought real benefits. However, it is an uncomfortable irony that changes disabled people and their organisations have long called suddenly came to the fore as part of our national response to a global health pandemic. Specific examples of some of the benefits for disabled people and independent living are listed in **Annex 1**.

It is important, when looking at these examples, to remember that the Disabled People's Movement adheres to the social rather than the

⁷ UN Convention on the Rights of Persons with Disabilities (disabled people)

<https://www.ohchr.org/en/instruments-mechanisms/instruments/convention-rights-persons-disabilities>

⁸ See Lori Frecker, Royal Society, "Addressing Barriers for STEM students and staff with disabilities" 2021.

medical model of disability⁹. Inclusion Scotland believes that people are not disabled because of a medical condition, but by barriers like:

- Other people's negative attitudes and lack of awareness;
- Inaccessible buildings, transport and communication methods;
- Poverty arising from cuts to benefits, social care charges, extra costs, and discrimination by employers;
- Services that should support us to live as full and equal citizens instead of taking away our freedom, choice and control; and
- Lack of information and power to make our voices heard.

None of these barriers are inevitable – so neither are disabled people's inequality and exclusion.

b. The risks of AI and digital exclusion for disabled people

As the economy and public sector budgets falter it is difficult to see when the scientific breakthroughs, heralded in the development laboratory and the media, will benefit disabled people by addressing the barriers and historic discrimination, poverty, and exclusion that are the everyday and lifetime reality for disabled people. This is coupled with the risks to rights posed by AI as it currently works.

The nature of AI

AI 'machine learning' often includes data shaped by prior human decisions and value judgments. This means that the same human biases, prejudices, and stereotypes that lead to discrimination can become embedded in AI-driven technologies thus prolonging and entrenching the discrimination that disabled people face¹⁰. Algorithms may end up systematising bias and they cannot simply unlearn a bias, and biased algorithms can be rolled out large scale at the risk of propagating discrimination.

Taking recruitment as an example the scenarios outlined in **Annex 2** highlight some of the ways disabled people can be excluded from employment opportunities by AI.

⁹ <https://inclusionScotland.org/get-informed/social-model>.

¹⁰ See Frederik Zuiderveen Borgesius, *Discrimination, Artificial Intelligence, and Algorithmic Decision-making* (Strasbourg, Council of Europe, 2018).

In employment, artificial intelligence is increasingly being deployed to allow continuous surveillance of workers and the automation of their supervision, with emerging evidence suggesting that disabled workers are being red-flagged at greater levels than their non-disabled colleagues.¹¹

Elsewhere, AI is transforming the relationship of the State with disabled people when it is used to restrict eligibility for social security benefits using biased data sets and discriminatory algorithms.

AI has also started to impact disabled people as consumers when faulty risk assessments (based on training data about certain impairments) can lead to improper increases in health and life insurance premiums.

A lack of transparency as to the underlying logic used by machine learning and automated decision-making also poses significant issues for disabled people. AI is often hidden from plain sight, either because the system's inner workings are concealed, or because the system is only understandable to those who can read and write computer code. This opacity is sometimes referred to as the 'black box' effect and it makes it unlikely that discrimination can be proven or challenged.

This is exacerbated by automation bias. Many people associate computers and algorithms with rational decision-making and faultlessness and this leads to unjustifiably high level of confidence in algorithms and a lack of attention to the risk of or evidence of discrimination. For example, sometimes the data for decision-making is deleted or not even collated, because of concerns over data protection. This can have the perverse consequence that it is nearly impossible to determine, retrospectively, whether discrimination against a disabled person has occurred.

Accessibility and usability

Another issue impacting disability inclusion through AI is that emerging technology products and services are not always accessible or user-friendly for disabled people.

For example, equipment may have small buttons or require a particular grip. Equally, if gesture recognition is employed, users may need to

¹¹ The European Parliament The ethics of artificial intelligence: Issues and initiatives [https://www.europarl.europa.eu/RegData/etudes/STUD/2020/634452/EPRS_STU\(2020\)634452_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2020/634452/EPRS_STU(2020)634452_EN.pdf)

move their body and / or their head, unless eye-tracking technology provides an alternative. Consequently, this can make experiencing reality technology inaccessible for some disabled people.

Smart technology may be inaccessible to disabled people if the apps that go with it include access barriers.

Elsewhere, concerns have been raised in relation to interference the Internet of Things may cause for hearing aids and cochlear implants as the spectrum they all share is becoming very congested, so the functioning of these hearing devices could be disrupted.¹²

Getting adequate support from manufacturers and operators about accessibility and usability features can be difficult for disabled people whereas it should be easy to contact technical support services and get advice where needed. Google has an accessibility support team¹³ available via phone, email, chat, and via Be My Eyes. Likewise, Apple provides phone and online accessibility support.¹⁴ However, few may be aware of these support services and some other technical teams can only be contacted by phone which is a barrier for people with hearing and speech impairments, deafblind people, and or those who may struggle to access a particular shop where a device is sold.

The European Accessibility Directive¹⁵ which aims to ensure access for disabled people to public sector websites and mobile apps applies to public bodies in the UK as it was implemented before the UK's EU Exit. However, the UK is not covered by the subsequent European Accessibility Act 2025, which aims to improve access to new products.

Digital exclusion

There is growing awareness of digital exclusion. Put simply, this prevents disabled people from benefitting from AI-driven technologies in the first place.

Access to the internet and the ability to access and use digital technology is increasingly how public, economic, and social life functions. It has transformed how most people work, communicate,

¹² <https://efhoh.org/wp-content/uploads/2017/04/EFHOH-Feedback-on-the-European-Commissions-Smart-Wearables.pdf>

¹³ <https://support.google.com/accessibility/answer/7641084?hl=en>

¹⁴ <https://support.apple.com/en-gb/contact>

¹⁵ <https://digital-strategy.ec.europa.eu/en/policies/web-accessibility>

consume, manage their finances and debts, learn, socially interact, access information, and benefit from vital public services.

While digital use has become integral to all aspects of life, the spread of access and use is uneven and some people, including many disabled people in Scotland, remain digitally excluded.

A useful way of thinking about digital exclusion and disabled people is a focus on kit, connectivity, and confidence and a lack of accessible alternatives to digital.

The failure of public bodies including the Department of Works and Pensions to provide suitable alternatives to digital communication and services excludes disabled people. Disabled people in receipt of Universal Credit have reported being sanctioned for struggling to complete their online journal. In April 2019, as many as one in three people seeking Citizen's Advice Bureau help with Universal Credit did so because they could not access the internet.

The same year, the UK Consumer Digital Index from Lloyds Bank showed that disabled people were 35% less likely to have essential digital skills.

The Scottish Household Survey shows that 29% of Scottish disabled people do not use the internet and in practical terms, others, who may technically have access via smartphones can have huge difficulties in using a mobile phone to complete forms or access services such as online banking, social security or council services – both in terms of affording the data to download information and in the accessibility of websites and online information. This is worse for those living in areas of deprivation and in socially rented housing as opposed to owning their own home.

Digital exclusion is both a cause and an effect of poverty, social isolation, barriers to information and services, and barriers to accessing opportunities.

The ongoing cost of living crisis, which means disabled people are having to make stark choices between eating and heating, and even whether to use energy for essential health and independent living equipment at home, means broadband costs or kit is unlikely to be a priority.

In seeking to address the digital poverty gap, it is important to bear in mind that devices and internet access are dependent on electricity and so for many living in the poorest households, lack of access to the internet intersects with fuel poverty. This compounds disabled people's financial exclusion, widens inequality, and makes accessing education, employment, social security, and public services difficult. The fallout of this exclusion will be long-term, with many effects emerging downstream, such as mental health implications and loss of income or ability to manage finances and debt. Disabled people on low incomes without access to online services are affected by the 'poverty premium' and end up paying more for basic goods and services, and those who most need health and care services are those least likely to be able to use digital health services.

Meanwhile, access to public connectivity (e.g. in libraries) has been significantly reduced in some areas of Scotland with austerity-related closures and may already be exclusive of disabled people because of transport barriers or the social care support to reach them.

Inclusion Scotland surveyed disabled people throughout April 2020 to find out what impact the Covid-19 pandemic was having on them. Over 800 disabled people and their carers responded, and it was clear from an analysis of the responses that risk from Covid-19 for disabled children and young people was about much more than simply risk to health.

The increased risk of poor outcomes for disabled people who could not access digital technology was magnified with the reduced access to face to face health care and rehabilitation service.

When thinking about confidence with digital technology many disabled people lack digital skills which are correlated to low educational attainment possibly as a result of earlier discrimination within education, a lack of accessible digital training or coaching, peer support with digital technology.

A suitable replacement for the human touch?

A further risk to disabled people is the replacement of humans and the presumption by others that this replacement is a good thing. Specific tasks traditionally provided by human social care support workers may increasingly be undertaken by robots. Whilst there are some tasks like

regulating heating and lighting that support greater autonomy, there are personal care tasks that are only suitable for humans to undertake.

Striking the right balance depends not only on; cost (which can work in favour of disabled people, but also for those who control social care budgets); security if something goes wrong, and; crucially, disabled people's informed consent. Decisions in this sphere must also take into account how reducing the presence of human carers will take away the 'human touch' and increase isolation.

Robots may be perceived as being cost-efficient and more productive but discussions on the ethics of replacing humans with robots continue. For disabled people, robots lack the ability to react to human emotional needs with a human emotional response.

Conclusion

There is much more that could be added to this briefing and more work to be done to fully explore the implications of AI with and for disabled people to remove the risks and disadvantages whilst growing the reach and benefits of the advantages.

But this must be done with disabled people ourselves. The General Comment document by the Committee on Economic, Social and Cultural Rights highlights the risks of discrimination to disabled people and emphasises the need for participation in decision making¹⁶.

Disabled people must be part of these discussions and any decisions that affect our lives. As the motto of the Disabled People's Movement says – **Nothing About Us Without Us.**

¹⁶ <https://documents-dds-ny.un.org/doc/UNDOC/GEN/G21/397/00/PDF/G2139700.pdf?OpenElement>

Annex 1 Examples of existing AI-driven benefits for disabled people (Section 4.a.)

- AI-voice-assisted smart speakers like Echo, Google Home, or Alexa, now enable many disabled people with mobility, dexterity and/or visual impairments to access information and control settings in their home including lights, heating, alarms, audio-visual equipment just by speaking to their devices. This does however exclude disabled people with speech impairments from benefiting equally.
- The Internet of Things smart devices are everything from thermostats to coffeemakers, televisions, or toothbrushes. Working together, connected devices can improve access and autonomy for disabled people, including products such as self-driving wheelchairs, smart canes, or wayfinding systems.
- Wearables such as smartwatches can also significantly increase independence for disabled people. Phones or smartwatches can work with other connected products, bringing even more benefits. Deafblind blogger Molly Watt explained how she is now able to answer phone calls or join conference calls using her smartwatch with sound streamed to her smart hearing aids¹⁷.
- Artificial intelligence-enabled systems can also contribute to better health outcomes for disabled people when used to diagnose illnesses, and recommend treatments, and are also beginning to be used to provide accessible peer support for those with mental health issues.
- If a disabled person falls at home, AI-driven systems can alert the emergency services, thus providing support for disabled people to live independently.
- Signing avatars (with limited vocabulary) assist Deaf people with short instructions or public information (in the context of a chronic shortage of human BSL interpreters, and the time and finance resources required to produce BSL videos).

¹⁷ <https://www.mollywatt.com/blog/entry/my-applewatch-after-365-days>

- AI-driven ‘text summarisation’ apps can support people with learning disabilities by converting complex information into easy-to-read texts.
- Advances in speech-to-text and text-to-speech technologies, lip reading recognition, and real-time captioning can be a critical aid to those with communication and sensory impairments.
- Image and facial recognition technology can now narrate the world around visually impaired people, by conveying visual information instantly with voice commands.
- Exoskeletons (wearable devices placed on the user’s body that act as amplifiers that augment, reinforce or restore human performance) have made an appearance in rehabilitation settings, supporting people with spinal cord injuries or other trauma affecting limbs and the nervous system.
- Large and medium size cities are increasingly adopting ‘smart’ city features, using digital technologies to make traditional networks and services more efficient for the benefit of inhabitants and businesses. According to European Parliament research, there are 240 European cities with populations over 100,000 that have some ‘smart city’ features. Amsterdam, Barcelona, Copenhagen, Dublin, Helsinki and Manchester ranked highest in the list of Europe’s “smartest” cities.¹⁸

This offers opportunities for ‘smarter’ urban transport networks, as well as water supply or environment services, or more efficient ways to light and heat buildings.

Smart cities can also mean more interactive and responsive public services, safer public spaces, and provide a unique opportunity to meet the accessibility needs of disabled people.

- Smart systems on a variety of public transport, such as buses and trains, can use technology to provide real-time updates to disabled passengers about access features like whether a wheelchair space is free. Smart environments can connect disabled people

¹⁸ [https://www.europarl.europa.eu/RegData/etudes/etudes/join/2014/507480/IPOL-ITRE_ET\(2014\)507480_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/etudes/join/2014/507480/IPOL-ITRE_ET(2014)507480_EN.pdf)

and their environments more closely, enabling greater independence through timely information.

Examples of beacon systems designed to enable safer and more accurate navigation of space can be of particular use for disabled people and were tested to help visually impaired people navigate their way around Euston Tube station in London¹⁹.

- Over time, the opportunity to use or drive an autonomous – or driverless – vehicle could also provide greater independence for many disabled people, reducing reliance on others and difficult journeys navigating inaccessible transport systems. Google tested its self-driving car technology with Steve Mahan, a blind user.²⁰

Annex 2 Examples of potential AI-driven discrimination in recruitment (Section 4.b.)

- Algorithmic decision-making for interview assessments that consist of interviews conducted solely through a technology platform will, of course, be seeking the ‘best person for the job’ and will potentially be supplied with data about employees deemed successful in the past to make this selection.
- Such data, in reflecting history, will consequently privilege those historically recruited candidates and will embed ableist assumptions. Disabled people have historically been excluded from the job market. It is unlikely to account for the benefits of recruiting disabled candidates and to rule them out of consideration before consideration of merit or whether and how a “reasonable adjustment” could assist them in meeting the essential functions of a job.
- CV-screening tools may prove an obstacle to disabled candidates who have not been able to secure an internship or voluntary work and those on a low income who cannot afford to take up these opportunities.
- Artificial intelligence-enabled interview video screening tools are typically developed without using disabled people as test subjects.

¹⁹ <https://www.wired.co.uk/article/wayfindr-navigation-visually-impaired-euston>

²⁰ <https://www.siliconrepublic.com/innovation/blind-man-tests-out-googles-self-driving-car#:~:text=Google%20has%20let%20Steve%20Mahan,of%20this%20new%20driving%20technology.>

That creates the possibility of exclusion based on ‘atypical attributes’ prior to a human interviewer meeting a candidate for a job.

- Disabled job seekers can be given a negative weighting in employment agency AI-driven scoring processes to determine employability, resulting in them allocating fewer resources and less support to disabled candidates in their job search.
- Increasingly popular, interviews powered by artificial intelligence subject candidates to assessments ranging from personality tests to gamified testing²¹. The algorithm searches for characteristics such as emotional stability, extroversion, impulsivity, or attention span in the data collected and may also measure facial expressions for the levels of eye contact and vocal enthusiasm of the interviewee which can all discriminate against disabled candidates. Added to this AI tools are often unable to, or improperly, read the facial expressions of some disabled people which can again lead to their exclusion.
- Bias in the algorithm may be introduced when choosing variables for the algorithm or while designing the algorithm. Variables that on the face of it seem entirely non-discriminatory may still lead to discrimination.
- A variable like ‘years of uninterrupted employment’, for example, can be an indication of good performance, but also an indication of gender, because women are more likely to have interruptions in their careers due to pregnancy and care duties or disability when someone may have had to take time out of work for impairment related reasons. Even without explicitly providing information about someone’s disability status (or gender or other protected characteristics) an algorithm can discriminate against certain groups of people.

²¹ Disability rights advocates are worried about discrimination in AI hiring tools
<https://www.technologyreview.com/2021/07/21/1029860/disability-rights-employment-discrimination-ai-hiring/>

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