FACIAL RECOGNITION AND THE FACIAL DIFFERENCE COMMUNITY:

2024 SURVEY RESULTS

FACE EQUALITY
INTERNATIONAL

Key stats:

Social media

32% of participants who had tried to upload one or more photos or videos of their face to social media had experienced difficulties.

This happened on platforms including Facebook, Instagram, Tiktok, Youtube, Tumblr and Snapchat. While the reason for the problem was not always specified or clear, some attempted uploads had been given content warnings by the platform. For example:

- 'I got a prompt that face wasnt a match'
- 'I have had various photos rejected from upload to social media or given a "content warning"'
- 'Mentioned the skin condition is not for kids under 18'
- 'Says no face is recognized or that no expression is recognized (for social media filters activated by facial emotion)'
- 'The platform doesn't recognise my face on my own device'

E-gates for passport checking at customs

The majority of people who had used e-gates at customs had experienced difficulties, making e-gates **one of the least inclusive technologies** measured in this survey. Among those who had tried, e-gates had **never worked for 12%, only worked occasionally for 23% and worked 'sometimes' for another 23%.** Only 27% said that they always worked for them. Some participants also expressed the **acute anxiety and embarrassment which these failures can cause in such a public place:**

- 'I always get nervous going though customs or border control because I know more than likely the egate is not going to work for me. In turn I then know that this means I have to speak to a border control officer who again will more than likely make a comment about my face or ask me what has happened to my face. These interactions have never been pleasant and often make me feel like they are judging or assessing me as to whether I am a threat. I particularly get anxious when this takes place when visiting countries where English is not spoken as it can be difficult to communicate. When travelling with friends or family I ask them to go after me so they can help support if necessary rather than being on the other side of the gate.'
- 'Can be very frustrating and embarrassing, and causes great delays especially in off peak times where officers rely on the technology to get travellers through. The

technology doesn't give any reason as to why it doesn't work but I can only assume it's because of my significant facial difference.'

- 'I had facial recognition fail twice, once at [US airport]. A border control agent had to get a coworker to come over and share her opinion on whether my face matched my ID.'
- 'Fortunately I can't afford to holiday much and so do so when my passport is relatively new and less so near it's expiry as otherwise my face may have aged and deteriorated significantly for facial recognition since the passport photo was taken and I'd struggle with it identifying me as me.'
- 'One eye is more "closed" than the other due to permanent swelling, so issues have occurred with face detection technology in the past such as e-gates and passport photo booths where I am instructed to open my eyes (and not wink!)'

Accessing secure bank account apps

When trying to use bank account apps (or similar secure mobile apps), 14% said the technology never worked for them, 4% said it works 'occasionally' and 29% said it only worked 'sometimes'. **Only 21% told us that the technology worked every time.** This poor performance caused very significant inconvenience and stress for some participants:

- 'Locked out of bank account. Bank re set it for me but had to contact their head office to disable the face recognition function.'
- 'As long as the app is connected to Face ID, it generally works smoothly. However, there was one bank app that required setting up biometric authentication. The bank's facial recognition system couldn't successfully recognize my face, which prevented me from completing the Face ID setup and therefore from making transfers'
- 'Had one app (unable to remember name) that required a photo to set up a bank account that I was unable to use as it would not approve that I was human.'
- 'I've given up trying and dread the day when that's the only way I can bank independently and other verification means cease. I can't use fingerprint recognition either.'

Photo apps (such as Google photos or Apple photos)

After e-gates at passport control, **photo apps were another poor performer in our survey** for consistent inclusion of the facial difference community. Those who had used an app such as Google photos or Apple photos to organise photographs into categories often had significant problems with the technology. **Just 25% indicated**

that these apps worked every time for their face. While only 4% said that it never worked for photos of their face and 11% said that it worked occasionally, **a huge 43% indicated that it only worked 'sometimes':**

- 'My Photos app thinks I am about five different people. Granted- I am also trans and so differences such as my haircut are part of it.'
- 'Harder to compile more pics of me when I'm smiling or showing expression rather than neutral'
- 'I use the Photos app on my iPhone, which can categorize images by people. The accuracy of categorizing my own photos is even higher than for recognizing others— probably because my birthmark makes me stand out. I can't decide if I should be flattered or amused by this!'
- 'I tried Google photos but had to give up. I feel excluded by my visible difference and asymmetry worsening over time.'

Face ID / Unlock to access mobile phone

Those who had tried using facial recognition to unlock their mobile phones had mixed results.

8% found that it never worked for them, and 14% told us that it only worked occasionally. In contrast, 43% said that it 'usually' works for them and 19% had experienced no problems with it. Examples:

- 'I recently got google pixel 9 and I was setting it up and tried to set up face ID to access my phone. I couldn't complete that setting. It kept asking me to tilt my head up/chin up. I couldn't succeed. The face id doesn't recognize my small and receding jaw. So, I just use my thumb id and/or code.'
- 'I use camouflage makeup up to cover my birthmarks but if I was to have no make up on my phone doesn't recognise me/face'
- 'iPhone 12 mini - usually works but had problems at different stages of my Healing'
- 'My facial difference is episodic, sometimes the technology works for me and sometimes it doesn't. iPhone'
- 'I have to wear sunglasses due to my eyes and sometimes it does not work with them on.'

Remote conferencing software such as Microsoft Teams, Google Meet and Zoom

This technology uses facial recognition for features such as background blurring and

applying filters. Very few of our participants had used filters, so the data on this was inconclusive. However, **the accuracy of background blurring performed relatively well,** with 25% of participants who had used it 'extremely satisfied' with the way it worked for them, and 42% fairly satisfied. Some still encountered problems sometimes:

- 'Due to the affected area on my face, I need to regularly apply gauze. I use flesh-colored tape, but during meetings, my image sometimes shows facial indentations (the area with the gauze tape can't be recognized as part of my face). software used:Teams & Zoom & Google Meet'
- 'Zoom, because the brightness hurts and burns skin'

Participant breakdown

There are 60 responses within the data set. We received 54 complete responses which met our inclusion criteria (over 18, lived experience of facial difference, and agreed to the survey terms and conditions). Responses which declared that they did not meet these criteria were unable to progress through the survey questions. We also received 23 partial responses. These were included within our analysis only where the participant disclosed their experiences of using at least one of the technologies listed. 6 partial responses were therefore included within the analysis in total, making a total of 60 responses.

Participants came from a number of countries, including Australia, Germany, India, Taiwan, US, UK, Netherlands. Most responses were from the UK and US. No demographic details (such as gender, age and race) were collected.

The participants listed a wide range of facial differences. These included skin conditions, scarring (including burns), hair loss, birthmarks, cranio-facial conditions, Grave's disease, Neurofibromatosis type 1, Parry-Romberg syndrome, Moebius syndrome, Treacher-Collins syndrome, Vascular Lymphatic Malformation, BPES, and facial reconstruction due to cancer. Some participants listed more than one type of difference. The participants were asked to categorise their facial difference against a number of criteria. 77% indicated that their facial difference made their face look asymmetric and 58% felt that it affects the way their face moves or expresses emotion. The participants offered a variety of reasons for these features, e.g.:

- 'Asymmetry and stiffness from (internal) scarring affects the shape and movement in my face, especially but not exclusively on [one] side'
- 'When the skin is too dry , it becomes difficult even to smile or open mouth'
- 'Top lip doesn't move'
- 'Half my face is paralyzed'

- 'The tissue and muscle wasting causes muscle spasms which makes me bite my inner cheek and tongue hard and suddenly. My […] Consultant Neurologist uses botox on that side of my face in the masseter and temporalis muscles to paralyse the spasms temporarily. It causes a lop-sided smile and botox restricts facial expressions on one side.'
- 'My jaw and surrounding area is under developed on the right side from radiotherapy [during childhood].'
- 'Eyes. Nose. Mouth & Ears are different.'
- 'One side of my face can be a lot more red and swollen.'
- 'One eye; skin flap where […] eye was.'
- Due to the nature of my procedure with the removal of the mandible using a doner bone from my leg has caused a change in shape for the tissue/bone structure.'

When asked how visible their facial difference is to others, the majority (55%) believed it was extremely visible to others by rating it as '5' on a scale of 1-5. (15% chose '4' for visibility, 18% chose '3', 8% rated the visibility of their facial difference as a '2' and 3% felt it was barely visible to others ('1')).

Patterns in the data

Given the number of conditions represented in the survey relative to the overall response rate, the numbers of participants with each condition was small. The presentation of particular conditions can also vary from person to person. These factors make it impossible, without more research, to determine whether certain conditions or features are being excluded to a greater degree by particular types of facial recognition technology.

However, with this important caveat in mind, two possible patterns for further investigation are worth noting. The first is that the survey data hinted that people with skin conditions might be having more unsatisfactory experiences with many different facial recognition uses. The second is a possibility that negative experiences of using facial recognition across several contexts are more common among those with conditions/injuries which alter the way someone's face moves or expresses emotion. This latter suggestion could indicate an interaction with 'liveness detection' features which can be employed as part of facial recognition technology (such as those which require someone to 'blink' on command). Or it may indicate that the technology struggles to connect different images of people whose faces move in different ways. The data is insufficient to reach conclusions on these possible patterns, and further exploration is needed.

Interestingly, the survey data does not support an assumption that only those people

who rated their facial difference as objectively more severe (awarding visibility scores of 3-5 on a scale of 1-5) are experiencing difficulties using facial recognition technology. People who rated their facial difference as objectively less noticeable are sometimes experiencing problems too. It is worth noting, though, that self-ratings of severity may not be reflective of objective severity ratings.

Other uses of facial recognition

The survey (Q17) asked participants about their experiences of using any other kind of facial recognition not mentioned above. The responses to this question revealed several contexts which have yet to be explored. These include passport photo booths, gaming software linked to facial expressions, ID checks for jobs, official documents and other purposes and self-checkouts in shops with video cameras. Comments include:

- 'I've recently had the pleasure of testing playAbility, software that can translate facial gestures to game controls. In it's default detection with my neutral expression the detection thinks that I have several slight gestures, such as a mouth moved to the right, a slightly closed eye, etc. The software allows for adjustments to its sensitivity but is still less comfortable to use as the expressions need to be more exaggerated for accurate detection.'
- 'Passport photo booths never work. The reason being for having one eye "closed"/ blinking. [One] side of my face is not symmetrical; it's 'swollen' and my eye is smaller and appears more closed. Can't help that!'
- 'I hate self check outs which have the image of you, again, it's like a constant mirror. Before this I avoided mirrors. If self check outs with that facial camera we're the only way to shop I would order online only.'
- 'I also had difficulty with the passport Photo Booth being able to verify my passport photo. It is very frustrating that this technology is being rolled out with most day to day activities without any thought or regard being given to those of us with a facial difference'
- 'I was unable to register for telehealth with Lemonaid - a 23 and me company - because of the facial recognition software not being able to match me to my [ID photo]. But there was no human being to help me. I put in a support ticket but just gave up. You're hurting That was only a few weeks ago'
- 'It is also hard to take ID pictures, they often get refused'
- '[…an employer] offered me a […] job [anonymised]. They needed a DBS check before I started (which is understandable). Still, I could not upload my identification to apps like YOTI or POST OFFICE ID APP because they didn't recognize my face as being real or authentic. This frustrated and saddened me as I am just a normal person who wants to work and use what I have learned to teach others, but it seems that with the obstacle of being discriminated by how I look each day, I am also

discriminated by my ID and it's affecting my income for jobs.'

The practical and emotional impact of facial recognition on the facial difference community

While technical functionality was the main focus of the survey, many participants told us about the practical and emotional impact which this and related technologies have more generally on their lives.

- '[…] some technology, like zoom meetings, now requires me to see my face a lot more. Even WhatsApp, Facebook, LinkedIn, they all have my photo. Part of me doesn't mind that as I want to be known in my professional arena. But equally I feel exposed sometimes, because I feel like my face needs to come with an explanation. I can't use filters because a filters automatic response is to blur my burns out so much you can't see them, which isn't what I want. Plus it is too big a jump from non burned me to the real me, so I can't attempt to hide behind filters, as I wouldn't just be slightly airbrushed, I'd be unrecognisable. I use an online platform for work meetings where I won't automatically know the other professionals in the room and it really impacts my ability to do my job when I'm looking at my own image in that meeting, but I know that particular meeting wouldn't function with me off camera due to the nature of my role and the forum it is. But I deeply struggle with it. I sometimes get distracted thinking, how do I look and what must they think of me. I always think that, but seeing myself magnifies it enormously.'
- 'Facial recognition can cause feelings of anxiety, embarassment and the all too common feeling of being bothered'
- 'Efforts should be made to ensure that facial recognition technology does not contribute to increased anxiety over physical appearance.'
- 'I find the filters on platforms such as instagram make fun of my facial difference […], ie their bulging eye filter is what I live with every day.'
- 'I hate seeing my face on teams or zoom. It's unnatural, we don't normally look in a mirror when we talk.'
- 'I mirror my image on Zoom and Teams so people see me in reverse to how I appear in person. Most people read from left to right and scan faces the same way with the lasting impression from what's visible on the left of a person's face which they see first. So by flipping myself online they see my bigger unaffected side first. I also tilt my screen to minimise the smaller side on screen and show more of my face side which is unaffected by [my condition]. I do this less with groups I'm familiar with who have an understanding of different disabilities and visible differences and don't stare or treat me differently and are inclusive. I feel more comfortable with like-minded people and able to relax and be myself in their company.'

It is perhaps not surprising, then, that a staggering **88% of participants would choose a phone or other technology which had been tested for full functionality with facial difference.**

Survey method

The survey was designed by an experienced researcher at FEI, and reviewed both internally and by an external UX professional before publication. It was published on our social media channels, and those of some of our members and ambassadors / face equality activists. The survey was open for a little over a month, after an extension to allow one of our organisational members to advertise it more widely to their members. A full list of the survey questions is available on request. No inducement was offered to participants – completion was entirely voluntary. Measures were put in place to protect the data produced.
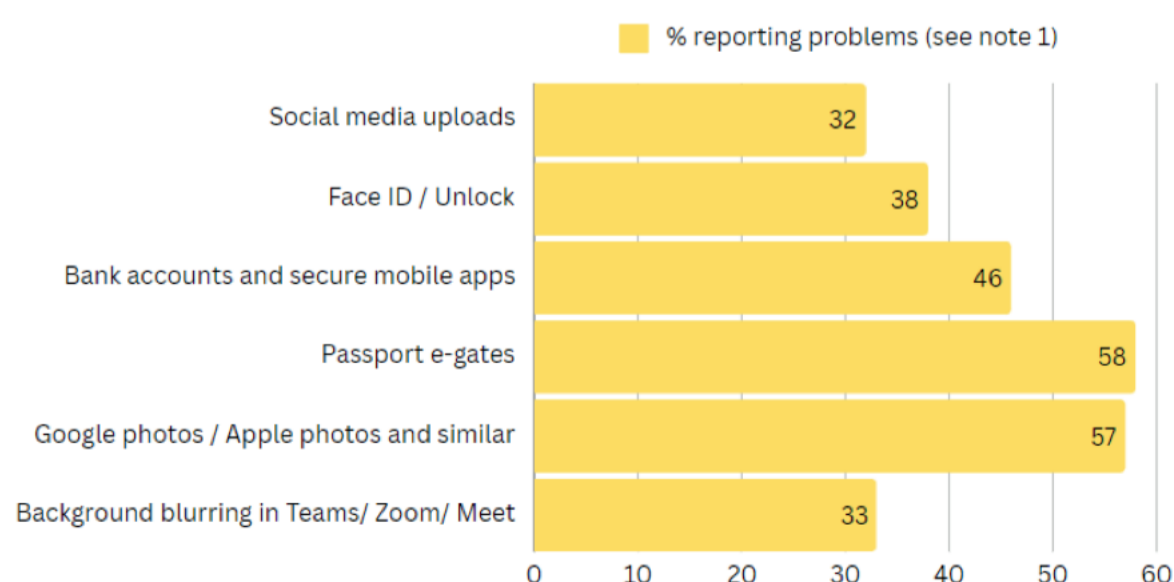
Limitations

1. The survey received responses from people within 8 different countries. This is likely to relate to the amount of publicity achieved in those countries, and unavoidably biases the sample towards experiences in those countries.
2. Relative to an estimated 72 million people globally with a facial difference, the number of responses achieved is small; while offering a good introductory insight, we make no claim as to representativeness or accuracy and further testing / research is needed.
3. Another limitation relates to the lack of transparency in facial recognition and AI. A number of participants highlighted uncertainty over whether tech failures were caused by the software's inability to read their face, or by other technical failures. Further testing would be advisable to ascertain how particular technologies respond to a variety of facial differences, so that unrelated technical glitches can be ruled out as contributing to particular patterns or failures.
4. Categorising facial difference is difficult. For example, some people might describe a post-surgery cleft lip scar as 'cranio-facial', while others would describe it as 'scarring'. Some people may have a combination of symptoms or conditions, and different conditions can present very differently in different people. The categories of facial difference therefore do not have clear boundaries, making it difficult to determine patterns in the data according to condition.
5. While both e-gates at passport control and photo apps performed worse in this survey relative to other technologies, further research would be beneficial to ascertain how far these results differ from the performance of the technology among people without facial differences.

6. Objective visibility of the condition was self-determined by the participants. These ratings are therefore subjective to some degree and unverified externally. Moreover, as responses were anonymous, no checks could be made to ensure that the people responding were accurately reporting their own appearances or experiences. Despite this, none of the responses gave reason to question their authenticity.
7. Although the survey questions were drafted neutrally to ensure the validity of responses, needing to rely on partner organisations and individuals to advertise the survey means that the messaging seen by participants before taking the survey may have varied. Given the difficulties of gathering responses, this was accepted as a limitation of the research design.

What now?

Our survey suggests that more needs to be done to make facial recognition technology inclusive of the facial difference community. We will be reaching out to selected organisations to highlight our findings and begin a conversation about how to improve this. We call on those developing and using this technology to:

- Partner with us on further testing to explore this issue in greater detail. The survey results should also be relevant to academics and we welcome further research and related collaborations in this area.
- Consult with the facial difference community to ensure their voices continue to be heard as the technology develops. Do get in touch to see how we can help.
- Be alive both to the need for better functionality, and to the emotional and practical impact of using facial features in so many important life contexts.

% reporting problems (see note 1)

Category	Value
Social media uploads	32
Face ID / Unlock	38
Bank accounts and secure mobile apps	46
Passport e-gates	58
Google photos / Apple photos and similar	57
Background blurring in Teams/ Zoom/ Meet	33