Facial age estimation

Fact sheet

We developed facial age estimation to give everyone a secure and private way to prove their age, without sharing their name or any identity documents. We also wanted to address the inclusion issue, given not everyone has a physical identity document - which can exclude them from accessing age-restricted goods, services and experiences.

The technology can determine a person's age from a live facial image. We believe this is a better way to check someone's age; people shouldn't have to share details like their address, full name, nationality and passport number, just to prove their age.

We understand there are concerns around data collection and people can be wary of new technology. There can be intrigue, mystery and questions about how new technology works. We work hard to clearly explain facial age estimation, but unfortunately, some people continue to call it facial recognition, believe that it's not private, and think it's a way to collect a database of faces. None of this is true. Other people misunderstand the accuracy rates, the age thresholds, and the true purpose of this technology.

We believe people should make up their own minds about whether they'd like to use this technology - based on the facts.

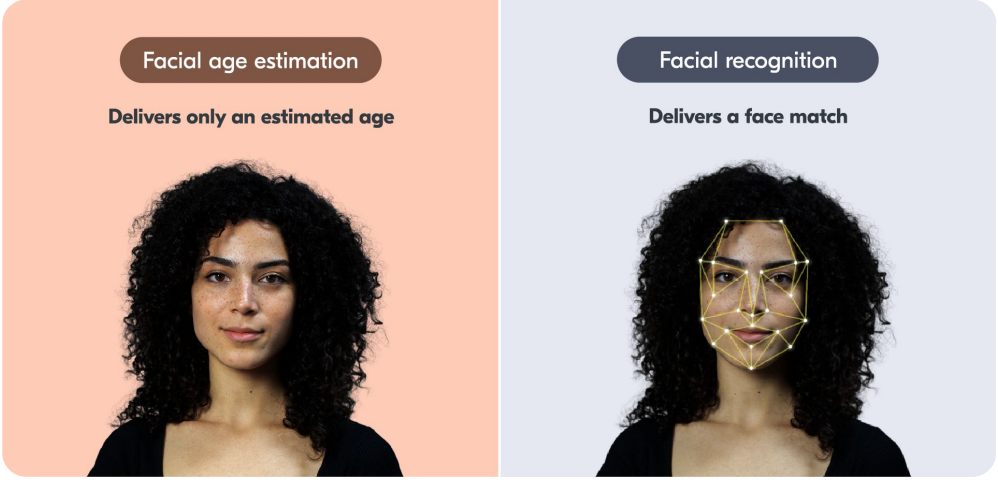
Fact 1

It is not facial recognition

The objective of facial age estimation technology is completely different and separate from the objective of facial recognition.

Facial age estimation delivers an estimated age result. Facial recognition delivers a match (or no match) between images of a person.

Facial age estimation technology is unable to recognise a face as it hasn't been trained to do that. It doesn't learn your name, identity or anything about you.

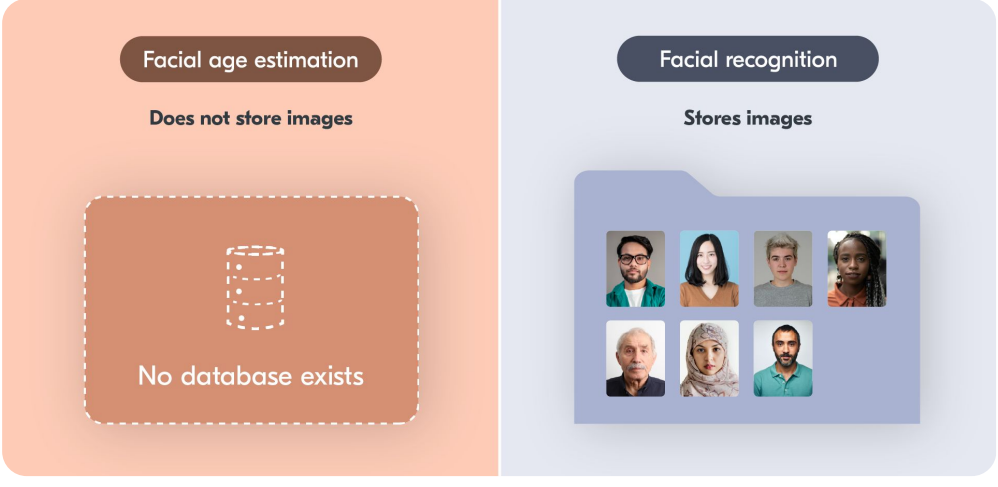


Fact 2

It is not collecting biometrics for a big database

We don't use facial age estimation to create a database of faces. As soon as an age estimate is delivered, we permanently delete the facial images in real time.

Because no images are saved, there is physically no way to create a database. We do not use them for our own learning or training purposes. This is externally reviewed as part of our SOC 2 and PAS1296 assessments.



Fact 3

Facial age estimation is private

Facial age estimation is a privacy-preserving way to prove your age.

When you show an identity document to prove your age, you reveal a lot of personal information about yourself – your date of birth, full name, passport number, photo and so on. You share all of this information every time you prove your age.

Facial age estimation is more private. You do not need to register to use it, provide any personal details or share any identity documents.

Your age is estimated from a facial image. Whilst at first, this might not sound that private, as soon as your age has been estimated the image is deleted. This means you can prove your age anonymously, without sharing any personal details.

Fact 4

Facial age estimation is accurate

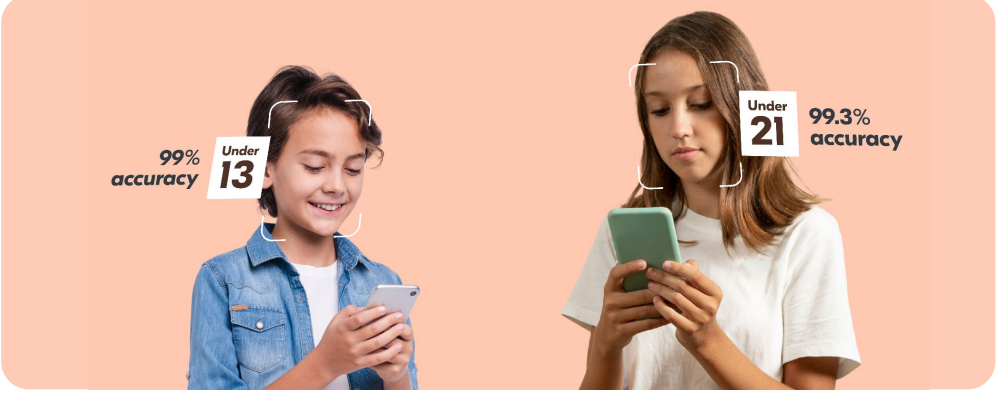
Our facial age estimation technology is highly accurate.

99.3% of 13-17 year olds are correctly estimated as under 21 and 99% of 6-12 year olds are correctly estimated as under 13.

We continue to improve the technology but a strive for perfection should not get in the way of progress - especially when the technology can be used to improve online safety, protect children and create age-appropriate experiences - all while protecting user privacy.

The technology is usually used with safety buffers, which can help mitigate any errors the technology can make. So in practical terms, if a business needs to check someone is over 18, they could set an age threshold of 25 - meaning everyone needs to be estimated as 25 or over. The technology will then estimate if someone is above or below the age of 25. This means that very few, if any, under 18s will get through the age check.

The technology is proven to be more accurate than humans at estimating age. Facial age estimation also has other clear benefits - it doesn't get tired on a long shift and can't show favour to friends or bias against people.

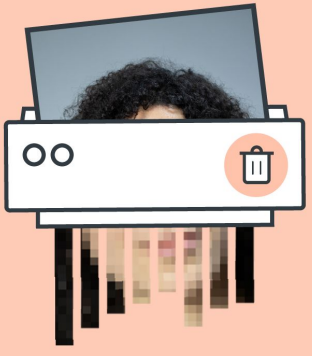


Fact 5

The facial image is always deleted

The technology can't estimate someone's age without an image. But as soon as the age is estimated, the image is permanently deleted.

We have no need to keep the image, so we don't. **No images are stored, shared or used for any other purpose than estimating age.**



Facial images are always and permanently deleted

Fact 6

It can’t link my buying or browsing habits to my face or identity

The technology simply estimates your age and that’s it. It hasn’t been trained to be able to do anything else.

It never knows your name, identity or your buying or browsing habits. It cannot record what you are buying or which website you are on - it just checks your age.

Yoti is built with a strong ethical framework and principles underpinning the system to protect people:

- Estimates age without identifying or recognising any individual person
- Supports people who do not own an ID document and so promotes social inclusion
- Privacy-preserving to help people’s identity remain anonymous
- No personal information is stored
- Promoting data minimisation in line with GDPR

Fact 7

The technology is being used by leading brands

So far, we have completed over 850 million facial age estimation checks.

Some of the largest businesses around the world have chosen this technology to create age-appropriate experiences - including Instagram, Facebook, OnlyFans, Yubo, John Lewis and Kids Web Services.

Supermarkets in the UK, including Asda, Morrisons, Tesco and Co-op, tested the technology as part of a Home Office regulatory sandbox. Retailers in the US and Europe have also trialled facial age estimation to strengthen age checks and improve the shopping experience.

Fact 8

It works fairly for all skin tones

Facial age estimation has been tested at scale on different skin tones. We transparently publish the accuracy rates for different ages and skin tones in our white papers.

For example, females aged 13-17 with a darker skin tone have a Mean Absolute Error (MAE) of 1.5. This means the age of someone with this skin tone in this age group will be estimated within 1.5 years of their age. In comparison, females aged 13-17 with lighter coloured skin have a MAE of 1.2 and those with the lightest skin tone have a MAE of 1.0.

We know we have more work to do in this area and are committed to reducing bias and improving accuracy levels even further.

The technology is scalable, it does not show discernible bias or personal favour, and it is accurate. All of these things can be measured, reported and improved on.

Yoti facial age estimation accuracy

Mean estimation error in years split by gender, skin tone and age band

Gender	Female				Male				All
Skintone	Tone 1	Tone 2	Tone 3	All	Tone 1	Tone 2	Tone 3	All	
6-12	1.1	1.3	1.5	1.3	1.1	1.2	1.3	1.2	**1.3**
13-17	1.0	1.2	1.5	1.2	0.8	1.0	1.3	1.0	**1.1**
18-24	2.3	2.2	2.5	2.3	2.0	1.8	1.8	1.9	**2.1**
25-70	2.4	2.7	3.2	2.8	2.3	2.6	3.1	2.7	**2.7**
6-70	2.2	2.4	2.8	2.5	2.0	2.3	2.6	2.3	**2.4**

Fact 9

Facial age estimation is effective, inclusive and private

Traditional age verification typically involves showing an identity document like a passport, driving licence or credit card. This can be an effective way to verify someone's age - but only if it is done to a high standard and checks are completed to ensure the ID is valid, genuine, and belongs to the right person.

It is very easy for someone to get hold of a fake, fraudulent or stolen ID - so it is not effective to simply read the date of birth on an identity document.

Checking an ID to determine its authenticity, and whether it's tampered with or a fake, can also be an intense process. Having employees do the process manually doesn't guarantee accuracy every time, especially with the accessibility and quality of fake IDs.

Facial age estimation is a proven age checking method. It offers many benefits where other age assurance methods fall down:

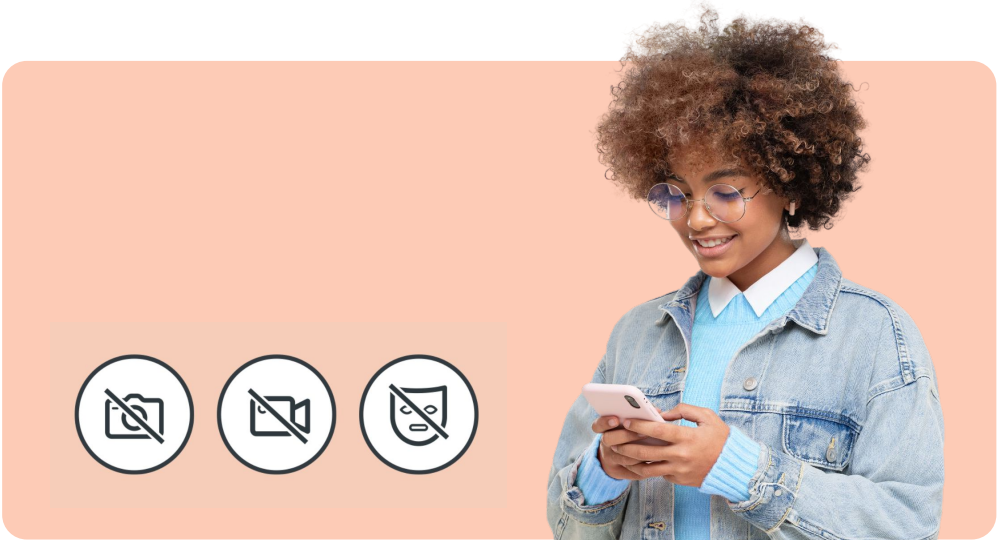
- **Free for users:** facial age estimation is free for individuals to use - they do not need to pay for expensive identity documents
- **Privacy-preserving:** people do not need to enter any personal information or share sensitive data displayed on their identity documents
- **Inclusive:** the technology estimates someone's age from a facial image without the need for a physical identity document or credit card

Fact 10

Liveness technology prevents people spoofing the technology

We've developed our own anti-spoofing liveness technology to prevent someone from using a photo, video, mask, bot, deepfake or injection attack to pass an age check. This ensures that a real person is completing the age estimation.

Our liveness technology has been independently tested to achieve iBeta NIST Level 2. This means it has been tested against more expensive, specialist spoofing attacks such as 3D printers, resin and latex face masks.



Fact 11

It has been independently tested

The ACCS independently evaluated our September 2024 model. They certified that we use appropriate methods to measure the performance and accuracy of our technology.

The US National Institute of Standards and Technology (NIST) concluded that Yoti facial age estimation is an effective way to check age and age ranges with an appropriate threshold. They also named us as the most accurate facial age estimation provider for 13-16 year olds.

Our liveness technology has been independently certified by NIST. A NIST certification means the product in question meets defined standards. NIST provides a framework for testing performance levels of liveness. NIST Level 2 involves testing the liveness technology against specialist attacks such as latex face masks or 3D printers. To pass NIST Level 2, companies must detect 99% of attacks. We achieved a 100% attack detection rate for facial age estimation.

German regulators KJM and FSM approved facial age estimation as an effective tool for protecting children online. It's an accepted and approved method for adult content sites in Germany.

Fact 12

It can protect children from accessing age-restricted content

The majority of children who have seen inappropriate content online have not gone looking for it - they have accidentally stumbled across it.

We are working with some of the largest platforms around the world to improve online safety and protect children from stumbling across content which is not appropriate for their age.

We have always been honest about the accuracy and limitations of this technology. Because it's an estimation method, there can be some errors. But companies can use a safety buffer to mitigate these potential errors and the **technology has been tested at scale.**

Facial age estimation is better than no age checking at all. It is more effective than asking someone to check a tick box or enter a date of birth online. And it's better than checking age against an identity document when this is poorly done.

This technology also strikes a better balance with privacy compared to other methods of checking age.

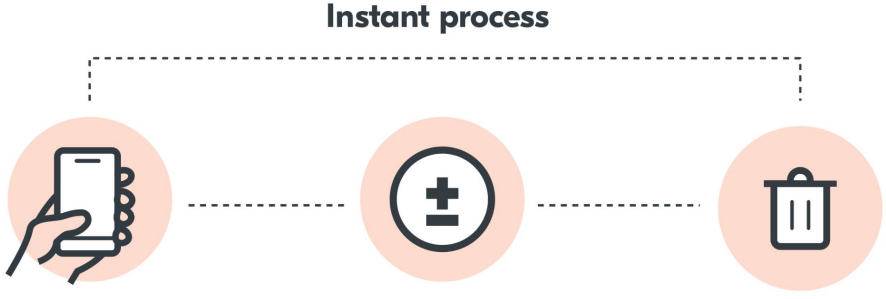
Fact 13

Facial age estimation is easy to use

We have designed our technology to be easy and quick to use.

You always need to provide consent before your age is estimated and then follow instructions on the screen explaining how to position your face for the age estimation check.

You simply look into the camera (on your laptop or phone) and take an image. Your age is then estimated from that image in around 1 second. As soon as your age has been estimated, the image is deleted.



Fact 14

It makes age checking more inclusive

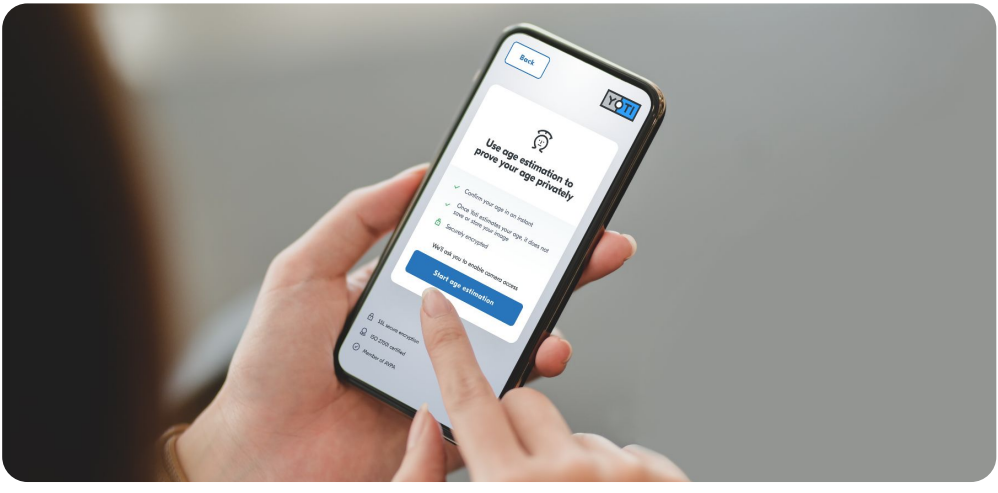
Not everyone owns or has access to identity documents which are typically used as proof of age.

Facial age estimation offers a more inclusive option. It can estimate someone's age from a facial image; it does not need any identity documents or personal information.

Not everyone will be able or want to use this technology though - and that's okay. Proving age should be a personal choice. We believe people should be able to select the method that works for them and the one they feel the most comfortable with.

Giving people choice also ensures age checking is accessible and inclusive to everyone.

For those who do wish to use facial age estimation, they will always consent to use it.



www.yoti.com/business/facial-age-estimation