

Rail Delivery Group



Biometrics is one of those sci-fi technologies which appears in movies from time to time – it’s usually Tom Cruise or Daniel Craig seen breaking in to a secure lab by faking a retina scan or palm print – clearly the biometrics in question being less robust than the intent. Increasingly, though, these technologies are becoming reality, creeping into our everyday lives, and appearing in the media – both positively and negatively. For example, many people are now completely comfortable to routinely use biometrics – in my case a fingerprint – to access their mobile device. However recent news articles highlighted privacy concerns around the Metropolitan Police using facial identification on CCTV imagery to identify suspects at London stations.

Biometrics describes methods of defining characteristics of people which can be used in identification and verification of identity. What does that mean? With all biometrics there are two main functions – both require pre-registration of individuals.

The first, which we will call verification, is about checking a person against a claimed identity. Is this person who they claim to be or who we suspect them to be (for example, is this person the same person as shown in this passport)? The details of the face presented for verification are checked against the biometric model stored in the passport – and a statistical score calculated. If that score meets the required threshold the person is “verified” and allowed into the country. If the score is not high enough, they are sent to a separate queue to be verified manually by the border guard.

The second type of biometric we will call identification. This is generally more controversial and is used to pick a person out of a list of pre-registered individuals. The list might include “none of these” or it might not. Identification can be used to search a database of faces for the most likely match, a database of voices to try to work out who is speaking or to scan a database to work out who left the finger print found at the scene of the crime.

Both types of biometric techniques are much more advanced than most people realise.

So why are RDG interested in biometrics and what are we doing? We identified some time ago that biometrics may become useful in the ticketing space. There are a few scenarios where we might use biometrics, for example:

Imagine... you buy your ticket and receive a discount because you are registered for biometric support. As you pass through the station the gateline opens automatically for you, because the system knows you are expected and identifies you from the relatively short list of ticket holders who could travel through this station today. Not only that, arrows light up to point you to the right platform, because the system knows where you are going. When you get on the train you fall asleep, as usual. Normally the ticket inspector would need to wake you to check your ticket, but this time, as she passes through the carriage she can leave you undisturbed as her body-worn camera identifies you and the system gives you a green light. Approaching your stop, your chair gently shakes you awake to warn you to get ready and, switching your hearing aid back on, you can now hear the announcement being made too. You retrieve your case and get ready to alight.

Rail Delivery Group



Imagine... you walk into the station and your train is already pulling in. You don't have a ticket but get on the train without bothering to buy one anyway. Your phone pings as you travel in relaxed comfort to your destination. You get off the train and simply walk out of the station towards the waiting taxi rank when your phone pings again – as you knew it would. The first message confirmed you were identified automatically from your pre-registered biometric. The second informs you of the charge for your journey and thanks you for travelling, wishing you a pleasant stay. The system works because you pre-registered. It knows which train you got on and maybe even where you sat on the train. It knows where you got off, and calculated the best fare for your journey, automatically, taking in to account all the other journeys you have made this month. It's even easier than using your contactless bankcard used to be.

Imagine... we've seen this person a few times before and he doesn't bother to pay. He thinks tickets are for suckers. But this time, the system, which is always watching as he boards, notes there are resources in the right position for a stop. We know where he is, which train he is on and where he sits. By the time the train reaches the next stop two BTP officers and a revenue inspector have been mobilised and are waiting. They have evidence of multiple offences by the same individual and they know exactly where he is on the train. They form a well-practiced pincer movement to avoid any trouble. A quiet word is all it takes, and another fare dodger is apprehended.

So, this technology is quite relevant to rail. However, some of those concepts make for slightly uncomfortable reading. Is society ready for this? Do customers want to be identified and tracked through the network for the sake of convenience? Are we ready for fare dodgers to be identified and their images stored so that offences can be prosecuted later, next time they travel? What are the implications for society?

In fact, much of what is described above is already technically possible. And in some areas is starting to happen. In Japan, automated gates are being tested to see if they can reliably identify and permit travel for registered users. In the UK, Eurostar have a project which will introduce biometrics to permit ticket and passport checks to be performed at the same time, automatically – allowing customers to breeze through check-in. And already there have been press concern about privacy and moves by some of the bigger tech players to control access to their algorithms.

What we have found is that the proverbial cat may already be out of the bag. In Russia users of the FindFace app can take a photo and retrieve matches from social media sites. There are YouTube demonstrations of clandestine photographs being taken and tied to social media identities. In Moscow, a huge facial identification project is underway. In China reports of improvements to their facial technology in the wake of the COVID pandemic seem to indicate improvements in this technology even for people who are wearing face masks. And operators like NTechLab and ClearView can scan a crowd and pick out a person – something which the Met Police were castigated for – but which would allow convenience if used for better purposes.

In the UK it seems likely that legislation will be needed to protect anonymity in public spaces and that the use of such technology will – and should – be restricted to purposes consistent with the principle of informed consent. Customers may be reluctant to register for these services unless we act responsibly and relatively quickly to control the narrative around facial recognition. The age of anonymity may be limited, whether we like it or not. The technology should be able to be used to improve the customer experience of rail ticketing.