

FACING THE FUTURE

Marie Clutterbuck reveals how our faces could hold the key to security in smart cities of the future

The *Cities in Motion Index*, prepared by the IESE Center for Globalization and Strategy, released its fourth edition in 2017. The index analyses 79 indicators across 10 dimensions of urban life to ascertain which are the 'smartest' cities in the world. European and North American cities lead in all dimensions (which include economy, social cohesion, environment and transportation) apart from the technology dimension, which is led by Taipei. However, it is interesting to note that the highest ranking smart cities – which are New York, London and Paris – also have very poor social cohesion scores suggesting that we still have a long way to go before we reach the truly smart and safe city.

So, what makes a truly smart city and what does the future hold for smart cities? A smart city utilises data collected from various kinds of devices to holistically optimise city operations. In recent research, Gartner has argued that more and more

FUTURE SMART CITIES WILL SEE FACIAL RECOGNITION AND BIOMETRICS UTILISED ON A LARGE SCALE

city governments are moving towards solutions that leverage internet of things (IoT) connected technologies. Cities are already switching from conventional street lamps to IoT LED lamps that allow city authorities to meter power and monitor the lamps for damage, and these are expected to form the backbone for 10 percent of smart city WANs (Wide Area Networks) by 2020.

'Holistically optimising city operations' in simple terms means that citizens' lives are made more efficient and more secure. The device that can be of most use in the security context (although it does also have its utilities when it comes to enabling a more efficient city) is the video camera. This can come in the form of CCTV, police dash cams, body-worn cameras and even mobile phone cameras. However, using a video camera simply to record video has limited use in the smart city of tomorrow. Such devices are useful as evidence for allocating liability after the fact. However, they don't provide the live

streaming element that is a prerequisite for all of the truly smart applications.

Live streaming video from the types of camera mentioned above has a variety of uses. For example, if an incident like a fire or terror attack occurs, having cameras on a rapid response vehicle – which are easy to access by the command team – will allow them to make additional operational decisions, such as what level of extra support is needed or what additional emergency services are required – such as police for crowd control or ambulances for casualties. As well as this, live streaming body-worn cameras on first responders' uniforms gives local and remote command teams the ability to view what is happening on the ground. They can also determine which additional actions need to be taken and can help teams decide if dangers start to exceed acceptable risk.

MAXIMISING EFFICIENCY

Live streaming video from CCTV cameras or even vehicles can also help heighten the efficiency and flow of a smart city. For example, if a traffic incident is identified, vehicles can be diverted in real time by electronic signage to reduce congestion at the scene of the accident.

However, streaming live video from a camera that isn't connected to an infrastructure via costly fibre optic cabling has proven challenging for security professionals, law enforcement and city planners alike. This is because it isn't viable to transmit video reliably over cellular networks, in contrast to simply receiving it. Transmitting video normally results in freezing and buffering issues, which can hinder efforts to fight crime and enable flow within a city as these services require real-time, zero latency video without delays. Therefore, special technology is required that copes with poor and varying bandwidths to allow a real-time view of any scene where cameras are present to support immediate decision making and smart city processes.

There are many approaches to transmitting video over cellular. For example, a specialist codec (encoding and decoding algorithm) that can provide secure and reliable video over ultra-low bandwidths has been developed that can cope when networks become constrained. Another technique, which is particularly useful if streaming video from police body-worn cameras or dash cams that move around,



Facial recognition can be used to keep the smart city of the future safe

is to create a local wireless 'bubble' at the scene, using wi-fi or mesh radio systems to provide local high-bandwidth communications that can communicate with a central location via cellular or even satellite communications.

FACING FACTS

The capabilities of live streaming video can be taken one step further with the deployment of live facial recognition technology. Facial recognition can be added on to any video surveillance camera that is recording at a high enough quality to identify faces. The technology works by capturing video, streaming the live feed back to a control centre and matching faces against any watch lists that the control centre owns. Importantly, the data of people who aren't on watch lists is not stored by the technology.

This technology can work to make the city safer in a number of ways. For example, facial recognition could spot a known drug dealer in a city centre where they

aren't supposed to be or it can identify if a group of known terror suspects are visiting the same location at the same time, and this will send an alert to the police. In an ideal world where the police have an automated, electronic workflow, the officer nearest to the location of the incident will be identified by GPS and told by the control room where to go and what to do. Most police forces aren't quite at this technological level yet, and will probably rely on communicating via radio in order to send the nearest response team to the scene.

As well as this, shopping centres will be able to create a database from analogue records of known shoplifters to identify criminals as soon as they enter the building. This will be even more effective if run cooperatively between all shopping centres and local businesses in an area, and will not only catch those acting suspiciously, but will act as a deterrent from shoplifting in the first place. Much of what has been discussed in this article may

appear futuristic, but it isn't far from becoming reality. Live streaming video and facial recognition are very much the art of the possible, with technology no longer being the inhibitor to progress in the form of smarter and safer cities. At this stage – which could be considered a transition period from a time of part-connectivity to full-connectivity – the main barrier to progress is public acceptance. Things are moving very fast, many of which require a different mindset to what exists today – starting with an acceptance of the numerous benefits of facial recognition.

SMART CITIES USE DATA COLLECTED FROM VARIOUS DEVICES TO OPTIMISE CITY OPERATIONS

The really futuristic smart city will see facial recognition and other biometrics utilised on a large scale; it will be hard to enjoy the enhanced speed and simplicity of travel and financial transactions of the future without relying on biometrics.

For example, when you travel to another country your face will become your ticket and passport. The ability to link ticketing systems with your facial identity might mean that the airport can identify you seamlessly. As well as this, when you want to complete a financial transaction a connected till might read that your mobile phone is in range and you will then be prompted to look at the terminal and smile to confirm the transaction. This two-part

authentication process could significantly reduce the likelihood of fraud.

It is going to be very hard to use services like public transport or banks if you are a wanted criminal. Getting into a country on a false passport will be nearly impossible. Security services will be able to watch for persons of interest on the streets, which will enable proactive policing. For example, if a group of known terror suspects visit a crowded place several times in one week, this will set off an alert to investigate.

FACE VALUE

On a consumer level, the technology will also enhance the personal driving experience alongside the development of autonomous cars. The modern connected car is already fitted with cameras to help with parking and to use for evidence in the event of an accident, but with the application of facial recognition they could be used for so much more. Imagine being able to unlock your car with a glance – keyless entry enabled by facial recognition is a more convenient option (you'll never have to worry about losing your keys) and a safer one, as it prevents car theft on a new level. Using facial recognition, cars will also be configured to turn on only if an authorised person is in the driving seat. As well as this, if several people are authorised to drive one car, it can adjust the seat, wing mirrors and radio station depending on the preference of the person whose face it captures in the driving seat.

The smart city of tomorrow is already technologically possible, and it's highly likely that our lives will become more connected and much safer as the years go by and these technologies are implemented throughout our smart and safe cities ●

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In the future the face will be used for ID and to pay for things

