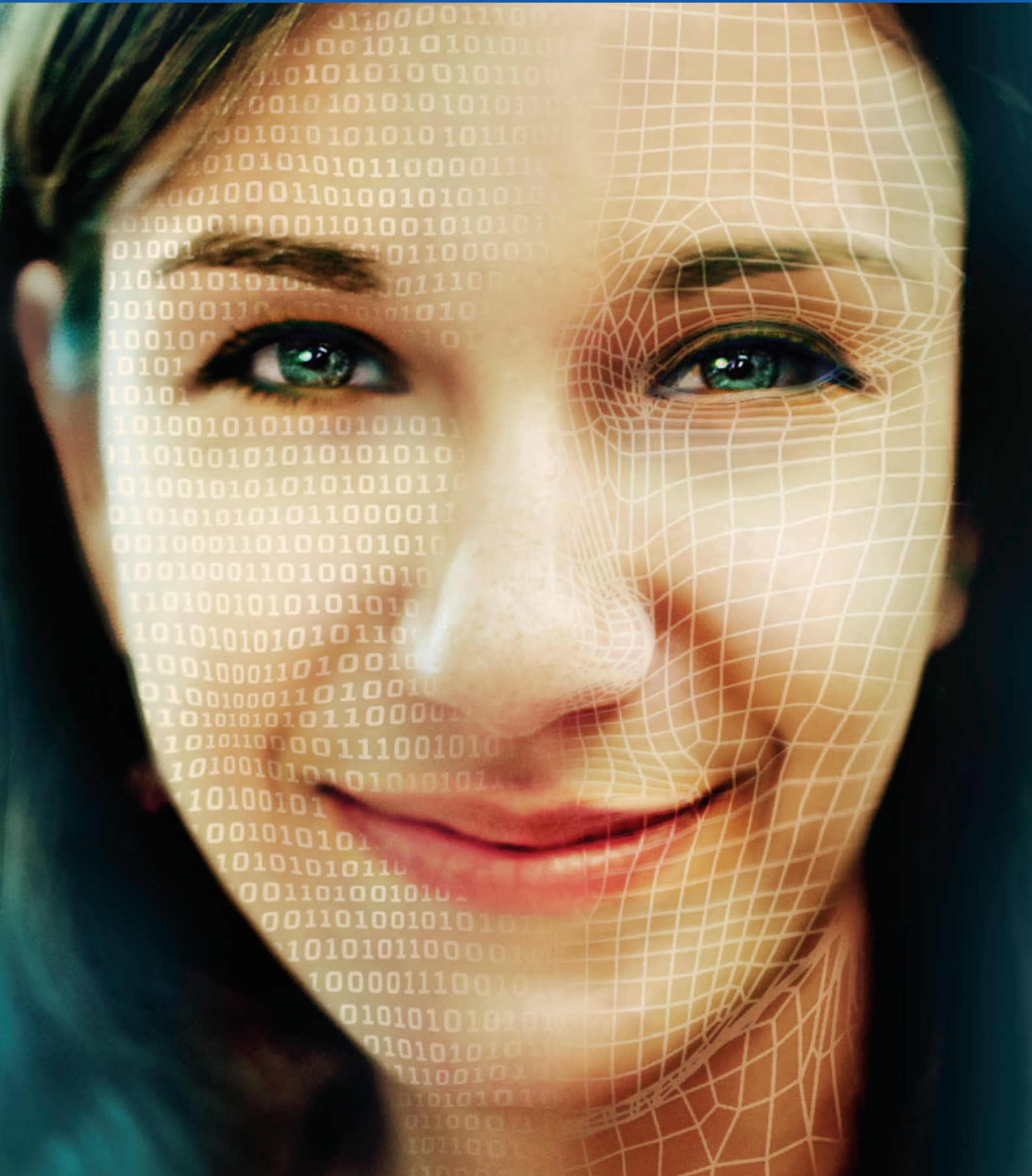BIOMETRICS

Face Recognition

Face
Recognition

Biometrics technology has matured rapidly over recent years, and the use of it for security and authentication purposes has become increasingly common. Biometrics technology uses biological data to identify an individual by analyzing and measuring characteristics such as fingerprints, DNA, iris and other unique attributes of a person.

Due to recent advances in the reliability, accuracy and performance, face recognition is the latest biometric technology to 'come of age'. Unlike other forms of biometric solutions, face recognition requires no physical or deliberate interaction by the subject, making it one of the more passive and less intrusive forms of biometrics.

Speed, accuracy and reliability are the main features required of a face recognition solution. Identifying people on a pre-defined watch list needs to happen without delay every time there is a near precise match. But a successful deployment of face recognition needs to consider a number of factors beyond the physical hardware and software. Lighting conditions, angles, aging, facial expressions and obstructions such as hats and facial hair, all need to be taken into account, along with calculating the required processing power and capture rates particularly if being used in a busy or crowded environment.

Like most biometrics technologies, security and public safety uses have been the driving factor behind the development and adoption of face recognition for verifying or identifying individuals. But the commercial sector is also beginning to see the potential gains to be had in recognizing an individual without the need for any interaction. Consequently, face recognition is being considered in a growing number of commercial applications which utilize the authentication and monitoring capabilities for less critical deployments.

NEC has years of experience in developing and deploying biometric technologies for security and commercial based applications across a variety of environments. This understanding of both the technology and the challenges has led to the creation of a series of face recognition applications that utilize NEC's market leading NeoFace® face recognition software.

NEC

Commercial Applications

Harnessing the benefits of face recognition for non-security based uses can provide organisations with a number of benefits in terms of improving customer service and enhanced business intelligence, as well as offering a real competitive advantage.

The opportunities to use facial recognition in the hospitality, leisure and retail markets are endless. Forward thinking organisations in these markets are deploying facial recognition to enable discrete handling of VIPs and the prevention of undesirable visitors.

Security Applications

NeoFace® face recognition can be used in a variety of security applications and environments for everyday tasks that can be automated, authenticated or enhanced, providing everyday people with a better quality of life and an improved level of security. Door access, retail, hospitality, border control, immigration, CCTV surveillance and law enforcement are just some of the areas NeoFace® is being used worldwide.

VIP IDENTIFICATION

In some businesses, identifying VIP's is important, whether it is to simply alert personnel to their presence or to automate access to a specific area for the VIP to improve the customer experience.

In other instances, the identification of a VIP in the database can trigger an alert or work process for personnel to perhaps provide some degree of special attention. The solution works by matching the captured image in the VIP database. Alerts can then be sent to key personnel, along with enhanced data on the individual.

QUEUE MONITORING

Queues are an annoyance to those in them, and a potential issue for responsible for the immediate environment around them.

The queue management solution measures the flow of individuals between multiple points, providing information on the number of individuals and the time between points. The system is configured with certain parameters, enabling it to monitor queuing times and estimate waiting times.

The solution can then trigger alerts to key personnel who can take remedial action such as opening new access or check points to help reduce queue lengths and times, improving the customer experience.

The solution can also help with monitoring public areas to alert when the area becomes too busy or overcrowded. Again alerts can be triggered to relevant personnel to take action to perhaps open more entry points or divert people to other areas, reducing the risk to public safety.

BUSINESS INTELLIGENCE

Face recognition can also be used to monitor, measure and collect data about people in a specific area to gather priceless intelligence to improve business activities and operations. For example, this can include counting people, age, gender, facial expressions and time in the area. This data can be collated and analyzed retrospectively or can even be used dynamically to trigger a real time event such as changing a message or content on digital signage.

Understanding more about the people in a specific area can help organisations to tailor activities to gain both commercial and customer experience benefits.

DETECTION OF UNWANTED INDIVIDUALS

One of the most common applications is identifying individuals in an open environment who provide a risk to public safety or a security risk or possibly are known trouble makers or offenders.

Using a watch-list database, face recognition can be used to identify these individuals quickly from the live CCTV footage or security surveillance cameras.

The face recognition software does a quick look up in the black list database and where a match is found, alerts can be made to security personnel or staff both on screen in the control room as well as sending the information to the most appropriate personnel best placed to react, enabling a quick response to the threat.

ACCESS CONTROL

Face recognition can also be used for access control solutions. This can include physical building entry where face recognition is used as a pass or a part of the entry process and linked directly with a door or turnstile. A positive match in the database triggers the opening of the door or turnstile, allowing the individual entry. It can also be integrated into an automated registration kiosk for visitors.

In addition, access control can be applied to other items which require restricted access, including for example drugs cupboards.

In some instances, access control solutions can be combined with a second monitoring system to identify any other people trying to enter on the back of an approved individual.

SECURE AREA MONITORING

Secure area monitoring works in identifying individuals within a specific area. The solution monitors faces and positively matches them against a database which can include staff, contractors and visitors.

In this application, if an individual is not matched in the database, then they are instantly identified as a risk or threat. Alerts can then be made to security personnel or other staff either on a central control room screen or in the form a message sent to the most appropriate personnel best placed to react, enabling a quick response to the threat.

NEC

Face
Recognition

NEC's Face recognition is independently recognized as among the fastest and most accurate Face recognition software on the market place according the latest tests done by the National Institute of Standards and Technology (NIST). The tests positioned NEC's face recognition software as the most accurate facial recognition software. These tests also demonstrated that NEC provides the fastest matching capability that is the most resistant to variants in angle, age and race.

Through the utilization of a unique matching face detection method, we are able to provide high speed and high accuracy for facial detection and facial features extraction. NEC's facial recognition relies on a modified Generalized Learning Vector Quantization (GLVQ) algorithm. GLVQ is not easily fooled by attempts to conceal identity through the usage of caps, hats or sunglasses.
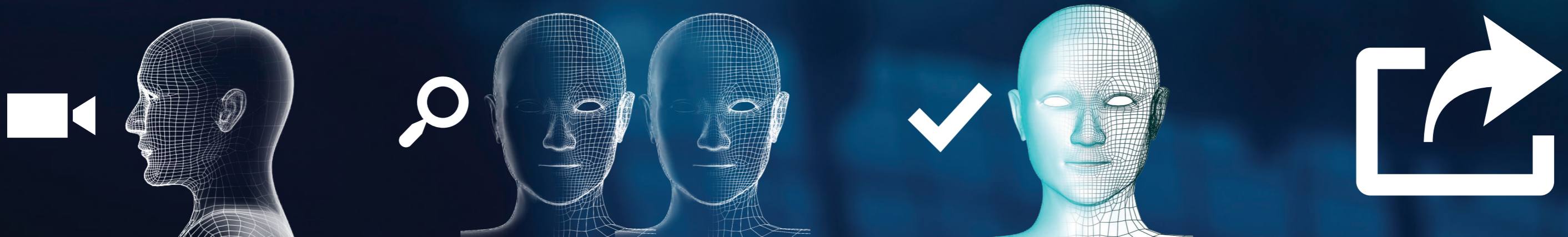
THE SOFTWARE WORKS TO A 4 PART PROCESS:

1. CAPTURE
The application takes in real time video from surveillance cameras, CCTV or archived video footage at a rate of up to 30 frames per second.

2. ASSESS
The individual frames of video are each assessed, faces are detected and then each one analysed to determine its unique facial signature.

3. MATCH
The software then undertakes a matching exercise against a watchlist database which includes enrolled images of individuals.
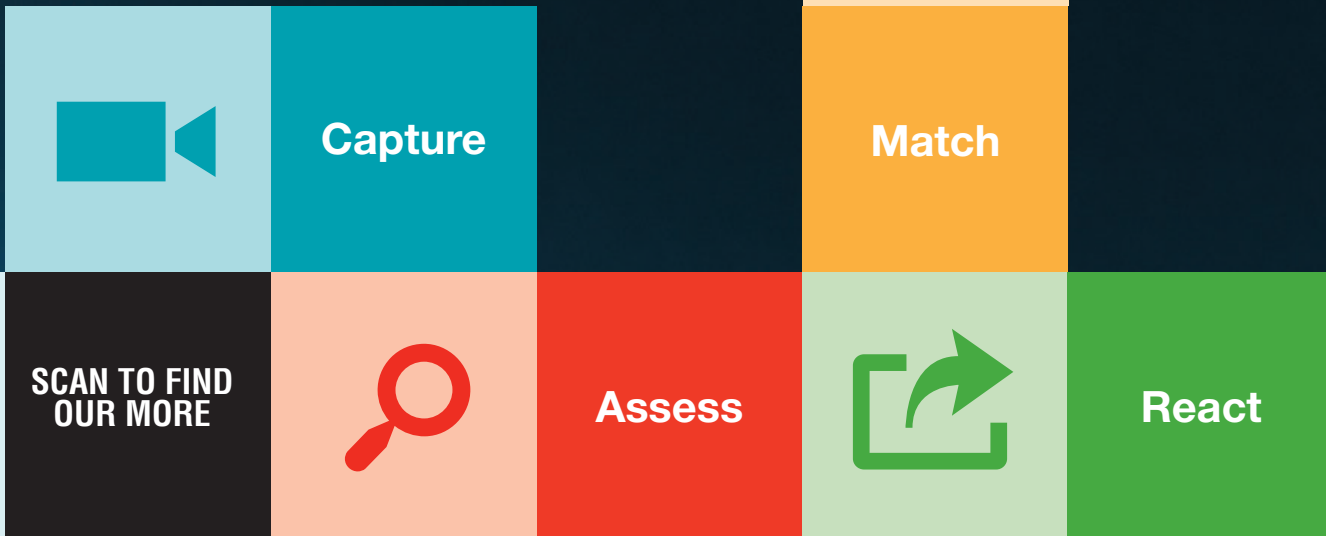
4. REACT
A series of outcomes can be configured from a successful match. These outcomes or actions can be configured to happen if there is a positive match against one of the images in the database or on a negative match where someone is spotted who is not in the database.

NEC

BIOMETRICS

Face
Recognition

Capture

Match

SCAN TO FIND OUR MORE

Assess

React

ABOUT NEC
IN SECURITY

NEC offers a comprehensive set of integrated security solutions including multi-biometric identification, access gates, video surveillance and behavior pattern analysis. NEC's fingerprint and facial recognition solutions are recognized as the world's fastest and most accurate biometric technologies for identification.

NEC has developed biometric technologies for more than 30 years and has solutions used by more than 1000 customers in over 30 countries worldwide. NEC's biometric solutions consistently perform to a high standard both in real-life and test environments, meaning technology that was once only considered as science fiction is now a realistic alternative for meeting today's challenges.

NEC's commitment to R&D has resulted in state of the art technologies such as behaviour recognition, age and gender recognition and NeoFace® - Facial Recognition. Compared with other biometrics like using fingerprint, palm print and iris, facial recognition has distinct advantages because of its unique characteristic of being a very fast non-contact process.

ABOUT NEC
CORPORATION

NEC supplies government agencies and private-sector companies with a range of IT services covering system building, maintenance and support, operation and outsourcing, as well as cloud services. NEC also supplies the platforms essential to the building of IT systems and enterprise network systems, such as servers, storage, software and IP telephony systems. Using its extensive experience in building highly reliable systems backed by state-of-the-art IT and network technologies, NEC aims to realize an information society friendly to humans and the earth. state-of-the-art IT and network technologies, NEC aims to realize an information society friendly to humans and the earth.

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