



NEC

Orchestrating a brighter world

John Smith

Missing Person

Eva Christina

Person of Interest

NeoFace® Watch

High Performance Facial Recognition

nec.co.nz

NeoFace® Watch: Proven to work in the real world, not just the laboratory

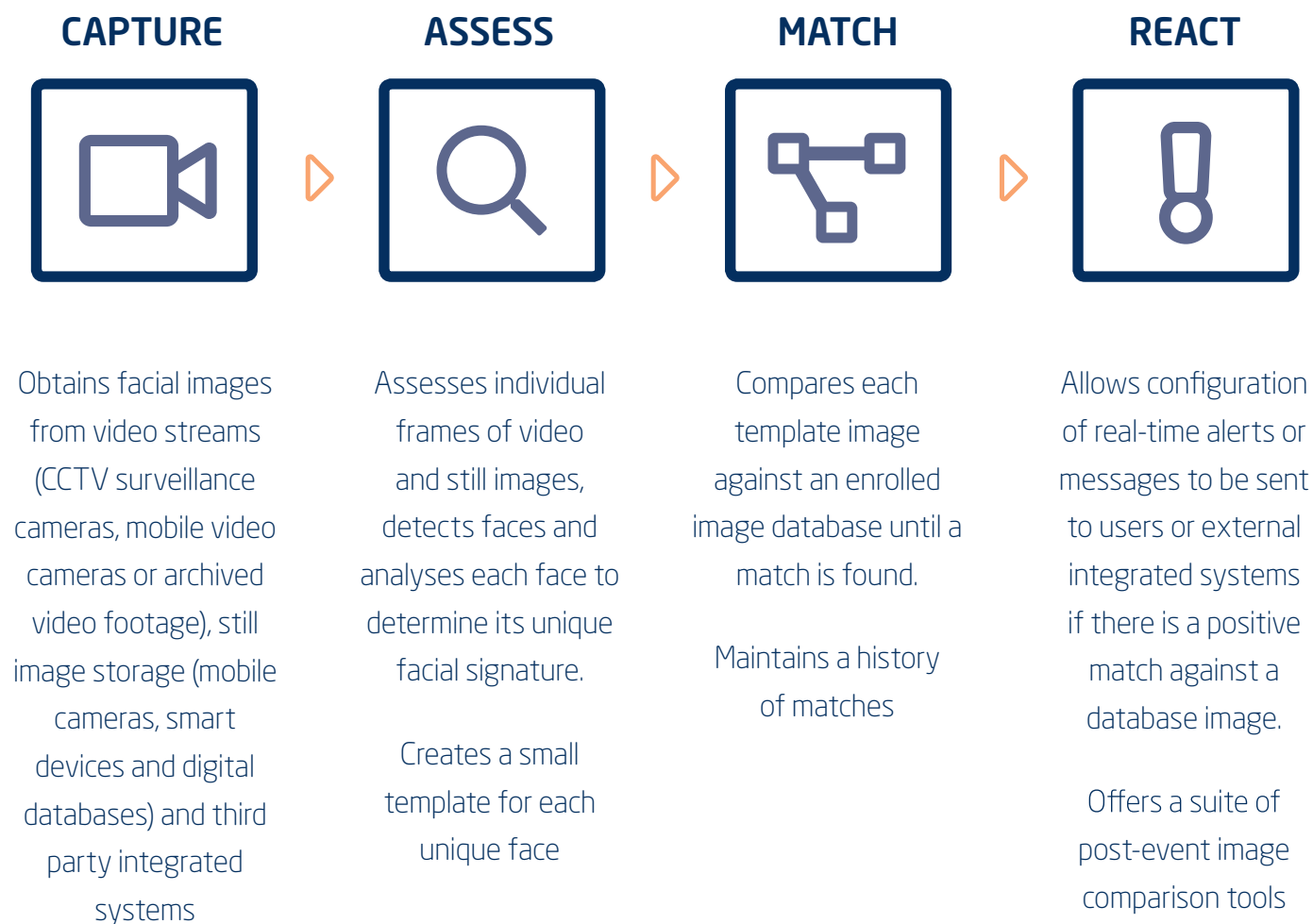
Answering the Need for Robust Face Recognition

NeoFace® Watch is a high performance, highly scalable face recognition software application, providing the most accurate and fastest results for the most demanding real-time or post-event face recognition use cases: large volumes of data throughput, large numbers of users, large numbers of devices, large scale deployments.

- For real-time or post-event, handling the most complex and large-scale use cases
- One platform for surveillance, search, identification and ID verification
- Most accurate and fastest face recognition software application available.



How NeoFace® Watch Works



Why NeoFace® Watch?

High Performance

Independently evaluated by NIST's¹ Face In Video Evaluation (FIVE) 2017 testing on ability to perform under the most demanding real-world circumstances² at the highest level of accuracy³.

Easy to Implement

We use common off-the-shelf hardware, including IP cameras, networks, servers and, where possible, existing infrastructure. NeoFace® Watch is also available for smart device applications on iOS and Android platforms.

Easy to Integrate

Using web service APIs, NeoFace® Watch easily integrates with other systems that manage videos, customer relationships and security, offering an added dimension in facial recognition competency.

Flexible

Easy-to-use system configuration tools and monitoring utilities enable customers to tailor NeoFace® Watch to specific operational requirements and ensure continued optimal operation.

Scalable

NeoFace® Watch caters to a wide range of architectural configurations to suit local deployment conditions and requirements, including multiple servers and across multiple sites. It is designed to handle millions of faces, thousands of cameras, and simultaneous user interface sessions.

1. National Institute of Standards and Technology (USA)

2. Moving people in crowded places (e.g. Detection of suspicious individuals at an indoor stadium)

3. At 2.5 times more accurate than the nearest competitor as tested in NIST FIVE 2017

The tests position NEC's face recognition software as the most accurate face recognition software even with low-quality images. Independent tests also demonstrate NEC provides the fastest matching capability most resistant to variants in angle, age and race.

Accuracy Rate (%) Simple Environment, e.g. Passenger Gate

Accuracy Rate (%) Difficult Environment, e.g. Stadium

Matching Accuracy

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Model	Simple Environment Accuracy (%)	Difficult Environment Accuracy (%)
A	~68	~20
B	~69	~10
C	~95	~35
D	~64	~18
E	~94	~28
F	~95	~38
G	~94	~58
H	~95	~40
I	~93	~65
J	~94	~38
K	~95	~10
L	~62	~5
M	~95	~85
N	~94	~30
O	~95	~88
P	~95	~85
Q	~95	~88
R	~92	~48
S	~95	~85



This graph is produced from data published in NIST Inter-agency Report 8173. Results of the test are not intended to imply recommendation or endorsement of particular products by the U.S. government

Fastest

- For small and large databases
- 3 million+ searches per second
- 2x faster than next nearest competitor
- 35x faster than some commonly used systems

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Country	Database Size	Performance (seconds)
NEC	1,600,000	3.02m / second
Japan	1,600,000	~1.7m
China	1,600,000	~1.4m
USA	1,600,000	~0.9m
Japan	640,000	~0.8m
China	640,000	~0.7m
USA	640,000	~0.7m
USA	160,000	~0.4m
France	160,000	~0.2m
Lithuania	160,000	~0.15m
China	160,000	~0.1m
China	160,000	~0.1m
Germany	160,000	~0.1m
China	160,000	~0.05m
China	160,000	~0.05m

NEC's unique index search technology performs faster with larger databases

Database Size	Performance (seconds)
1,600,000	6.23s
640,000	3.81s
160,000	3.02s
20,000	1.54s

NEC's face recognition is independently recognised as the fastest and most accurate face recognition software in the market*

*As tested by the U.S. National Institute of Standards & Technology (NIST), 2009, 2010, 2013, 2017.

Using NeoFace® Watch

Real-time



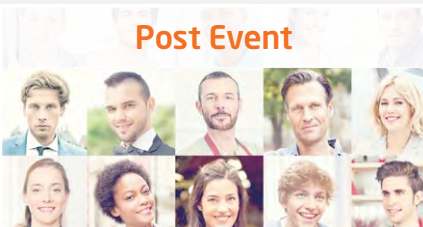
Video

Surveillance and monitoring to identify persons of interest from CCTV and mobile video cameras

Still Image

Searching images captured from mobile cameras and smart devices in real-time against databases of persons of interest

Post Event



Video

Analysis of recorded video to identify persons of interest very quickly

Still Image

Analysis of images captured from video stills, mobile cameras and smart devices against databases of persons of interest

Integration



Integration

Obtaining video or still images from external systems and notifying those systems if a system alert is triggered

Matching Platform

Using the NeoFace® Watch matching platform to compare two images, or single images against a centrally held database of persons of interest, returning the match score generated

NeoFace® Watch Working in Your Vertical

CAPTURE



ASSESS



MATCH



REACT



Police & Public Safety

- Speed investigations and close more cases using crime scene images and video.
- Process video from multiple sources including body worn and in-vehicle cameras, task specific and permanently deployed surveillance cameras, and citizen sourced evidence.
- Monitor for persons of concern in high-crime impact zones and at critical infrastructure.
- Quickly validate identities against civil ID and mug-photo databases during field encounters and traffic stops.

Transportation

- Monitor for persons of concern and automate alerts to security staff.
- Create searchable face archives for physical access control audits and investigation.
- Document security contacts for liability, investigations and reporting.
- Speed investigations and close more cases using surveillance images and video.
- Process video from multiple sources including body worn and in-vehicle cameras, task specific and permanently deployed surveillance cameras and citizen sourced evidence.

Stadium Events

- Monitor ticketing and security check queue times assuring optimal service levels and customer experience.
- Speed authentication of credentialed visitors and scheduled staff, reducing time-card fraud and unauthorized access to events and facilities.
- Monitor for persons of concern and automate alerts to security staff.
- Create searchable face archives for physical access control audits and investigation.
- Document security contacts for liability, investigations and reporting.



NeoFace Watch® Working in Your Vertical

CAPTURE



ASSESS



MATCH



REACT



Retail

- Speed up fraud and theft investigations and close more cases using surveillance images and video.
- Recognize opt-in loyalty program members and quickly access their shopping history.
- Monitor checkout queue and total shopping times, assuring optimal service levels and customer experience.
- Process video from multiple sources including body worn cameras, task specific and permanently deployed surveillance cameras, and citizen sourced evidence.
- Document security contacts for identity confirmation, law enforcement investigations and reporting.

Gaming

- Speed authentication of credentialed visitors and scheduled staff, reducing time-card fraud and unauthorized access to events and facilities.
- Create searchable face archives for physical access control audits and investigation.
- Monitor for persons of concern and VIPs, automating alerts to security and guest services staff.
- Document security contacts for liability, investigations and reporting.

Hospitality

- Enable VIPs and high value customers to access premier services such as priority check-in.
- Facilitate faster queue management and provide a personalised experience.
- Seamless update customer loyalty points.
- Understand customer preferences: how do you like your coffee?
- Capture and report on business analytics



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