Cognitec

The face recognition company

Most experienced and highly trusted

Various independent evaluation tests continue to prove the outstanding performance of Cognitec's FaceVACS® software.

Algorithm research and optimization since 1995 have resulted in outstanding independence from variances such as head pose, facial mimic, age, hair styles, glasses, and temporary lighting changes.

If the system is set to operate at an FMR of 10-7 (one fraudster in 10 Million will not be detected), B14 shows 0.24% of images as not being the same person, even though they are, while B14 returns 0.1% false results. The error rate was reduced by a factor of almost 2.5.

Verification performance

for > 744 Million comparisons with passport-style images of adults, as used in passports, drivers' licenses, ID cards, and other ID documents.

The test database contains highly challenging image material, with age differences of 10 years.

— B15 engine (2023)

— B14 engine (2021)

For algorithm training and optimization, Cognitec uses internal proprietary databases which do not contain any data from test databases.

Cognitec develops market-leading face recognition technologies and applications for enterprise and government customers around the world for

- recognition of persons in still photographs or videos
- comparison to image databases
- analysis of person characteristics

Cognitec's products implement the different processes involved in today's identity management systems using facial data for

- identity verification
- duplicate check
- background check
- real-time identification in video streams or footage
- acquisition of standards-based biometric portraits

At the same time, Cognitec's products enable commercial and consumer-facing applications using facial images to
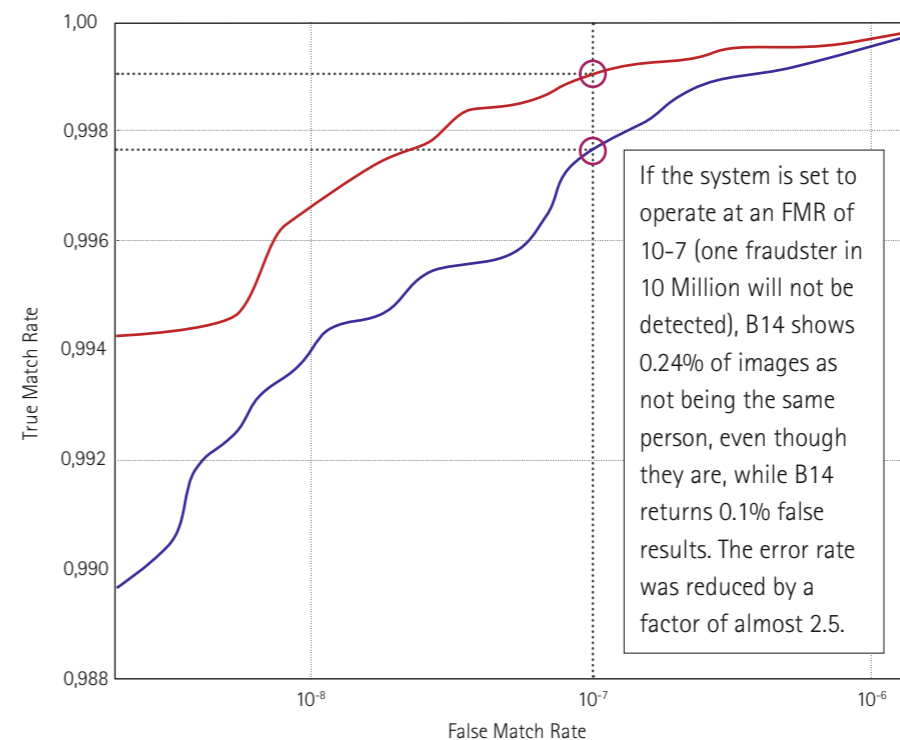
- recognize VIP customers
- index and sort photographs in digital photo albums
- analyze people flow by count, age, gender and other measures
- enable digital signage devices to tailor advertisements
- authenticate users during phone, PC, and banking login processes

Cognitec's research and development efforts have always focused on biometric performance. Independent tests performed by government authorities and industry clients have validated Cognitec's leadership position within the face recognition market, resulting in a track record of successful reference projects worldwide.

NIST* Tests

FRVT ** 2019

Cognitec announced its successful participation in the FRVT: Identification, confirming the solid market position of the FaceVACS matching technology, and the achievements of the company's algorithm research and development.

The September 2019 results, comparing 203 algorithms, show Cognitec's excellent identification performance for large mugshot galleries, and greatly improved performance values for unconstrained images with severe pose variations.

FRVT 2021

Compared against our main competitors, Cognitec's B14 algorithm showed excellent performance results across all accuracy tests in the Ongoing FRVT 1:1, with lowest error rates for visa and mugshot images. The results stay within 0.5 %–1 % of the top-ranked competitor in each category.

In the 1:N test, B14 achieved the best speed-accuracy tradeoff in comparison to competitive commercial technologies.

FRTE *** 2023

In most sub-categories of the 1:1 and 1:N tests, the reports exhibit significant accuracy improvements over the previous Cognitec algorithm submissions, rewarding research and development efforts to improve face and landmark finders.

In addition, the algorithm shows very low variation of False Match Rates across demographic groups, proving that Cognitec's matching algorithm holds an outstanding position as one of the least biased face recognition technologies.

*NIST: National Institute of Standards and Technology | ** FRVT: Face Recognition Vendor Test | *** FRTE: Face Recognition Technology Evaluation

Products and technologies

Cognitec develops and markets face recognition applications based on the world-leading FaceVACS technology.

Easy integration of our products is ensured through open system architecture and professional support.

FaceVACS-Entry

quickly captures ISO-compliant facial images and verifies the person's identity during border checks and various ID issuance processes. The slim, light-weight device installs in eGates and kiosks, on desks and walls, and in free-standing pillars.

> Read more on page 5.

FaceVACS-VideoScan

recognizes people's faces in live video streams and recorded videos, compares them to image databases, and instantly finds known persons. Anonymous facial analysis computes data to count individuals, analyze demographics and track people flow.

> Read more on page 6 and 7.

FaceVACS-DBScan LE

combines our image database search technology with powerful video inspection tools for a multitude of investigation use cases. The toolset includes various filters to enhance image quality and inspect image pairs.

> Read more on page 8.

FaceVACS-DBScan ID

compares images from different sources to those stored in multi-million image databases, preventing ID fraud and managing large ID photo databases.
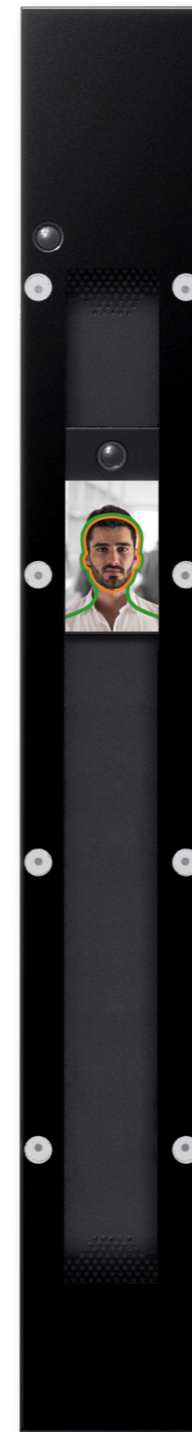
> Read more on page 9.

FaceVACS Engine

enables customers to develop new applications using face recognition technology.

> Read more on page 9.

FaceVACS-Entry

- quickly captures ISO-compliant facial images for biometric photo enrollment
- enables travelers to complete self-service or supervised border control procedures in seconds
- compares live facial images to biometric photos retrieved from ID documents, tokens or databases
- performs instant biometric verification to allow entry to traveler or deny access
- detects presentation attacks (checks for presence of a real face)
- integrates easily into eGates, border and ID issuance work stations, and access control solutions

Components and features

The FaceVACS-Entry product is sold as a hardware device (various P2 panel versions) that includes pre-installed face recognition software for photo capture, verification and identification processes, and software to scan QR codes.

P2

- slim, lightweight design
- various models for different person height ranges
- monitor displays mirror live image, a moving face marker and static silhouette for facial position guidance, and other user instructions
- fast height adjustment according to face position
- includes various VESA mounting options for installation on booths, counters, desks, walls, or in free-standing pillars
- installs onto certified glass surfaces or can be ordered with glass cover

Photo capture and QR scan

- performs continuous scene analysis
- uses cutting-edge pattern recognition technologies to determine the quality characteristics of portrait images
- applies key measurements for ICAO and ISO standards compliance tests
- supports automatic or operator-triggered image capture
- scans QR codes via the monitor

Verification / identification

- compares live images against previously recorded images in ID documents and/or facial images in databases
- incorporates Cognitec's best face recognition algorithm
- delivers industry-leading matching accuracy and speed

Find a demo video at www.cognitec.com

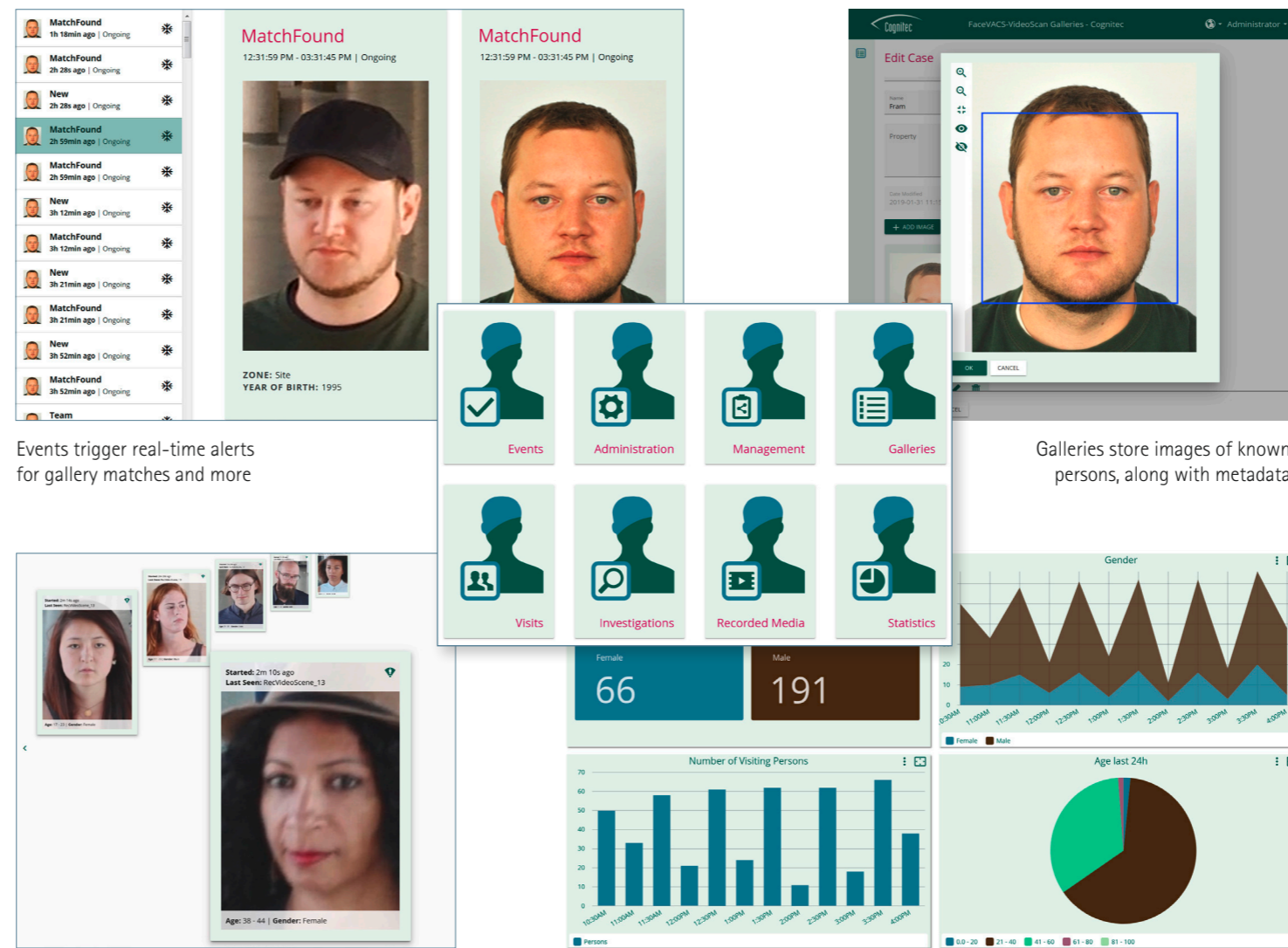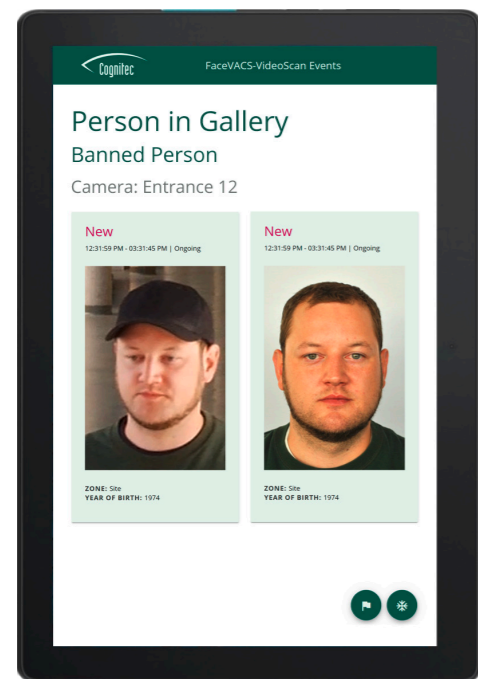Please request the specification document from our sales team at sales@cognitec.com

Applications

- biometric photo capture during border checks (Entry/Exit programs)
- self-service passport check during immigration processes (eGate)
- issuance of passports, national IDs, drivers' licenses, and corporate IDs
- high-security access control scenarios

FaceVACS-VideoScan

- instantly detect, track, recognize and analyze people in live video streams or recorded video footage
- perform instant comparisons to image databases/watch lists
- receive real-time notifications when user-defined events occur (e.g., Banned Person at Entrance West)
- alert staff to persons not wearing a required virus protection face mask

- send event notifications via email or Telegram instant messenger
- use anonymous face recognition to compute people analytics while protecting privacy
- store and view face streams for each appearance of a person over time

Find a demo video at www.cognitec.com

Person in Gallery
Banned Person
Camera: Entrance 12

Events trigger real-time alerts for gallery matches and more

Galleries store images of known persons, along with metadata

Visits show the appearances of all persons along a time line

66   191

Statistics display various people analytics in flexible formats

Applications

Physical security
- screening of public and private places (e.g., malls, banks, airports, business centers, real estate)
- identify intruders, unauthorized personnel, shoplifters and otherwise barred persons
- find subjects in videos recorded at a specific location and time

Business intelligence
- count visitors by zones within your facility
- detect repeat visitors and frequency of visits
- detect age, gender and ethnicity distribution

People flow/analytics
- perform anonymous face recognition to measure crowds and waiting/transit times in specific areas
- alert to persons not wearing a virus protection face mask

Intelligent signage
- detect age and gender of the audience, and deliver tailored messages and displays

Border control
- check persons at border checkpoints against a watch list of undesired immigrants

VIP recognition
- identify registered customers in clubs, banks or stores
- offer special treatment

General features

- stores high-resolution video sequence of the cropped face (face stream) of each appearance
- compares all persons against each other in real time to cluster identities
- clusters and displays all appearances of each person
- provides predefined event detectors with configurable parameters
- enrolls images to watch lists, also from live video streams

- quickly imports sets of recorded videos
- performs complex investigations on persons appearing in real-time camera streams and/or recorded video files
- allows for user access control by role
- **uses Cognitec's latest algorithms for face finding, matching, age estimation and underage detection (18 or 21)**

Event notifications

FaceVACS-VideoScan installs with a catalog of pre-defined event types. An event appears in the application interface and/or a mobile device if, for example:
- a person is matching a gallery image
- a person is matching certain criteria (e.g., male, under 18, 30-40 years old)
- a person is first seen within one area and later within another (transit)
- more than *n* persons are seen within a specified area (crowd)

Statistics

Users can configure data display for:
- count of individuals during a respective time window
- average transit time
- distribution of male/female visitors
- distribution of age groups

Managed service option

FaceVACS-VideoScan ES

The Enterprise Solution offers customers all the advantages of a turnkey solution.

Cognitec has selected optimal computing and camera equipment to guarantee industry-leading biometric performance.

The subscription-based system can be installed at the customer's premises, at the edge, or in the cloud.

FaceVACS-DBScan LE

- investigate faces in video footage, still images and sketches
- find known or unknown persons in multiple videos to quickly narrow down suspect investigations

- enroll facial images directly from a video frame for further investigations
- quickly compare faces to local galleries or to central multi-million image databases

- instantly view match candidate lists
- enhance probe image quality and compare images side by side
- install as a ready-to-use application or integrate into your infrastructures

Find a demo video at www.cognitec.com

Probe 23
ID nr. 84572
Unkown sus
First saved:
Officer: 7564
Last change
Officer: 039
Image sourc
Case ID: 23-

ANNOTATE
ENHANCE
IDENTIFY

Thursday, April 1, 08:45 am   Camera 17, Hall 9 East

Candidates

| 1 | 0.83 | 2 | 0.64 | 3 | 0.62 | 4 | 0.28 | 5 | 0.26 | 6 | 0.35 | 7 | 0.23 |

Applications

Video investigation
- view all appearances of a person in multiple videos
- search appearances/videos to find:
  - unknown persons
  - persons appearing together
  - frequently seen persons or groups
  - known persons

Image search
- process faces in still images or from video frames recorded by mobile devices, surveillance cameras, bodycams, etc.
- compare faces with images of known persons

Person identifcation at the crime scene
- take photos with mobile devices
- search central databases
- view match candidates and related case information

FaceVACS-DBScan ID

- compare facial images to multi-million image databases
- detect ID fraud and clerical errors
- control score thresholds
- perform database de-duplication (1:n or n:n) to compare, clean and maintain ID databases with facial images

Score: 0.9341

Case ID: MOXA567
Name: Anna Smith
Birth: 1985-02-05
Gender: female
Audit Date: 2018-03-25

Applications

ID management
- prevent ID fraud
- find clerical errors in ID databases
- find duplicate ID photos in large image databases

Photo search
- compare person photographs with image databases, e.g., of celebrities or user groups

Photo gallery indexing and sorting
- search digital image collections
- use a facial image to find and sort photos automatically

FaceVACS Engine

- develop new face recognition applications with use-case and platform-specific software development kits
- work with clear and logical APIs
- use industry-leading algorithms for enrollment, verification, identification, age estimation, gender detection, and portrait characteristics check
- use for various platforms, from mobile devices to high-end servers

Biometric photo capture
- check compliance of ID photos with international standards for biometric facial images (e.g., the ISO 39794-5 standard for Full Frontal image type)
- integrate real-time compliance check into ID document issuance processes to take biometric photos
- use also in kiosks for self-service ID photo acquisition

Bundesamt
für Sicherheit in der
Informationstechnik

Zertifikat
nach Technischen Richtlinien des BSI

BSI-TR-03121

Zertifikat-Nr.:
BSI-KTR-0084-2011

Independent certification from the
German Federal Office for IT Security

Applications

- ID management
- access control
- border control
- VIP recognition

- phone, PC, and banking login
- photo indexing and sorting
- web applications for digital photo gallery search

- intelligent digital signage and kiosks
- automotive applications: driver recognition and safety
- humanoid/service robots

About Cognitec

Cognitec is the only company worldwide that has worked exclusively on face recognition technology since its inception in 2002.

Experiencing steady growth at business locations in Dresden, Boston and Sydney, the company is proud to maintain a stable, market-leading position within the industry, and to uphold the trust it has gained as a reliable, experienced provider of biometric technologies.

Our founders have been working on specific algorithms for face recognition technology since 1995. Commencing as early as 1996, government and industry customers began relying on the FaceVACS technology for a wide range of applications.

Our technology and products are built on the extensive knowledge of our scientists and software engineers. Their continuing dedication aims to deliver the best performance available on the market. Successful implementations worldwide confirm excellent performance in terms of recognition accuracy, response times, scalability and reliability.

Cognitec's products are easy to use, flexible, extendable, and take into account current industry standards. We provide our partners with open system architecture and excellent documentation, tutorials, training, and technical support.

In order to best serve our worldwide customers, Cognitec has established sales and support offices in Germany, the United States and Australia.

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Cognitec is a member of

- ASIAL
- Biometrics Institute
- European Association for Biometrics
- IBMATA
- Sedex
- TribalHub

Official Supporter of the Biometrics Institute Privacy Charter

Reference projects

Since 2002, Cognitec has partnered with more than 400 clients, value-added resellers and system integrators in 50+ countries. Our partners have developed and continue to create new solutions using our technology—testament to the technical proficiency and customer-friendliness of our products. Here are a few examples:

Border control

comparison of passport photo to the person´s face in more than 1000 automated border control solutions worldwide (including eGate systems from various system integrators)

Voter registration

de-duplication of voter registration image database in Africa (database size of 10 million images)

Video security

real-time recognition of known persons (shoplifters, problem gamblers, terrorists, etc.) at casinos, airports, stores and border control points in Canada, Panama, the UK and the US

ID management

duplicate check of new passport photos by comparison to multi-million image databases of existing passport images; used by passport, visa and driver's license agencies in Australia, Canada, Germany and the US

Law enforcement

identification of suspects from photographs and video stills in comparison to multi-million image databases of offenders; used in Australia, France, the Netherlands, Germany, and the US (database sizes range from 200,000 to 7 million)

People flow management

real-time analytics and redirection of human traffic at Gatwick Airport (with 175 cameras), London City Airport (with 10 cameras), Edinburgh Airport and Luton Airport, via the MFlow application developed by Human Recognition Systems

A more complete list of customers can be found at www.cognitec.com or send a request for references to sales@cognitec.com.

Cognitec

With a clear focus on
face recognition technology,
we are committed to delivering
the best performance
available on the market.

sales@cognitec.com

www.cognitec.com

About the cover artist

The oil painting was created for Cognitec by Vietnamese artist Do Van Binh. Born in 1975
in the Nam Dinh Province, he grew up in a large family with six siblings, and has been
painting since the age of seven. He is a graduate of the Vietnam University of Fine Arts
and represented by the D&C Art Gallery in Hanoi: oilpaintingdc.com