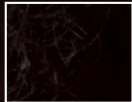




Cognitec

The face recognition  
company





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

### **Cognitec develops a face recognition engine and related technologies that allow:**

- recognition of persons from still photographs or video
- 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:**

- 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 new commercial and consumer applications using facial data:**

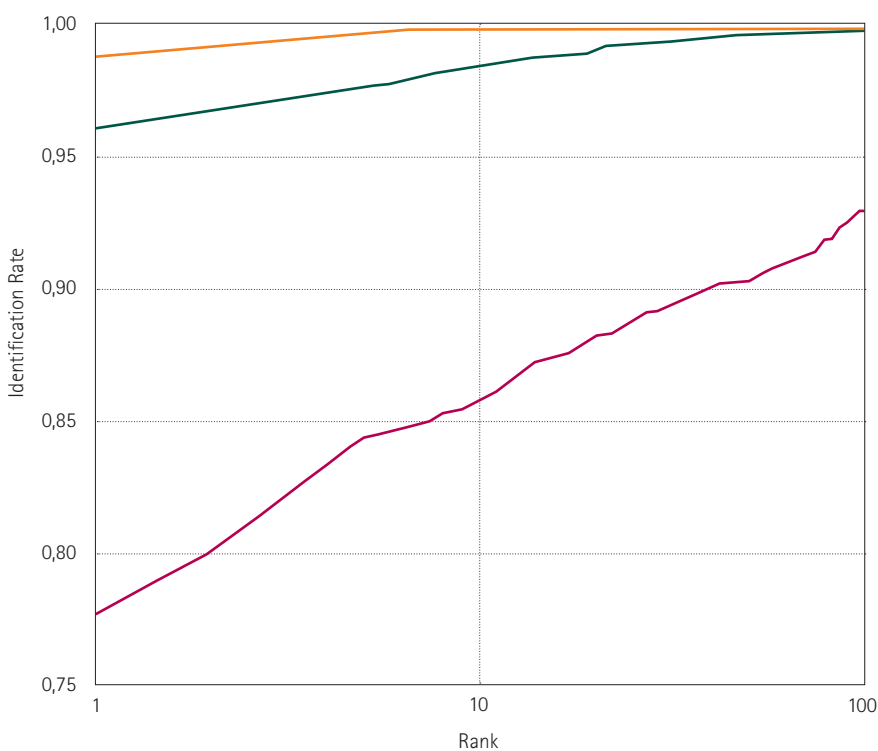
- recognizing VIP customers
- indexing and sorting photographs in digital photo albums
- analyzing people flow by count, age, gender and other measures
- enabling digital signage devices to tailor advertisements
- user authentication for phone, PC, and banking login

Cognitec's R&D efforts have always focused on biometric performance. Continued tests of government authorities and industry have validated Cognitec's leadership position within the face recognition market since 2002, resulting in a track record of successful reference projects worldwide.

# Leading the Industry

Various independent evaluation tests have proven the market-leading recognition accuracy and speed of our FaceVACS® software.

Twenty years of algorithm research and optimization have resulted in outstanding independence from facial variances such as pose, mimic, age variance, different hair styles, glasses or temporary lighting changes.



## Identification performance

Closed-set identification performance in Grayscale FERET Duplicate I Test

- B10 engine (2016)
- B2 engine (FRVT 2006)
- FRVT 2002 engine

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

The 'Duplicate I' test involves the following subsets of the FERET database: a gallery including 1196 images of 1181 persons and a probe set of 722 images of 242 persons.

### FRVT 2002

NIST's\* first Face Recognition Vendor Test awarded Cognitec's software best performance among all participants for large-scale verification, identification and watch list scenarios.

### FRVT 2006

The NIST test conducted in 2006 confirmed the leading performance of Cognitec's technology. With 22 participating companies and research institutes, only Cognitec and ten other participants could complete the large-scale tests, and only Cognitec and one other company could deliver

measurements in four different test scenarios for still images and 2D/3D data. Cognitec also exceeded the goal specified by the so-called Face Recognition Grand Challenge, or FRGC, which was to prove increased recognition performance compared to the FRVT 2002.

### MBE 2010

The results of the MBE 2010/MBE-STILL reaffirmed the excellent performance of Cognitec's algorithms, in particular for identification use cases, and showed substantial performance improvement over the previous test.

### FRVT 2013

The last independent testing of leading face recognition engines was conducted in 2013, with results published by NIST in 2014. Test results on the performance of automated age estimation algorithm show Cognitec's algorithm performing with the highest accuracy for all age groups.

\*NIST: National Institute of Standards and Technology

# FaceVACS Products

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-DBScan with Examiner

compares images from different sources to those stored in multi-million image databases; the Examiner tool set offers powerful tools for image enhancement and inspection.

> [Read more on page 5.](#)

## FaceVACS-VideoScan

detects and identifies persons of interest in real time while computing demographic and behavioral data, supporting security staff, marketing departments and operations management with one application.

> [Read more on page 6 and 7.](#)

## FaceVACS-Entry

combines smart hardware for image acquisition with market-leading software for verification processes, and is ready for integration into electronic gates (eGates) at border control checkpoints.

> [Read more on page 8.](#)

## FaceVACS-PortraitAcquisition

streamlines the production of high-quality photos suitable for ID documents and future face recognition, and performs compliance checks for ISO 19794-5 and other standards.

> [Read more on page 9.](#)

## FaceVACS Technology

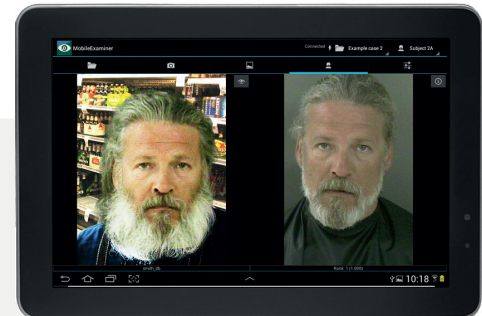
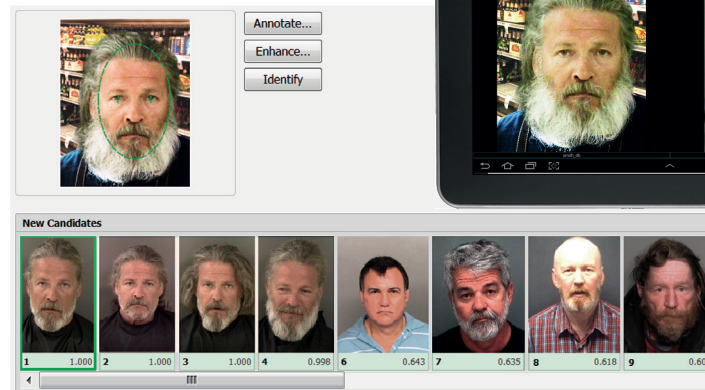
enables customers to develop new applications using face recognition technology.

> [Read more on page 9.](#)



# FaceVACS-DBScan with Examiner

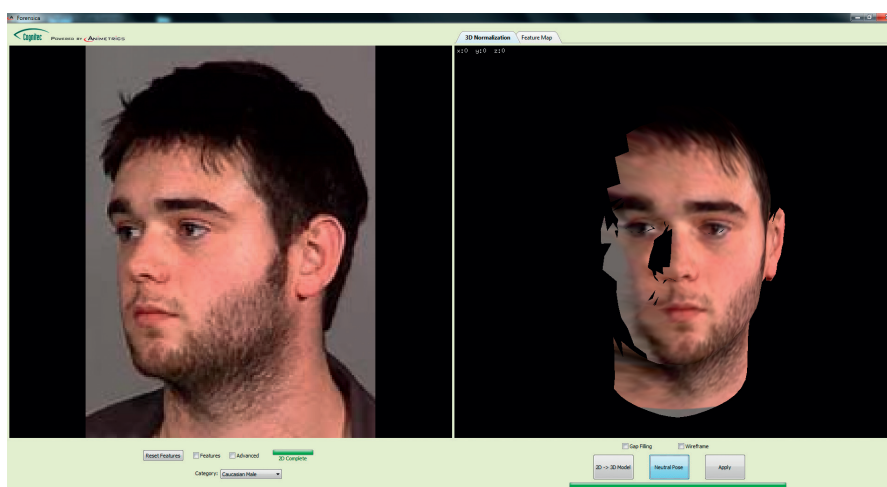
- compare facial images from different sources to those stored in multi-million image databases
- instantly view match lists with the most similar identities
- control thresholds and match list sizes
- apply Examiner tools and filters to enhance images and compare them side by side
- use Mobile Examiner to take suspect photos at the scene and search central databases
- run as a ready-to-use application or integrate into your infrastructure




## Reduce investigation time and costs

Investigators rely on our innovative technology to match crime scene photos and surveillance video images against the agency's mug shot repository and immediately act upon the search results. Enhancement filters allow operators to

normalize poses, de-interlace video images, remove noise, correct contrast and more. Examiner also supports detail inspection with side-by-side views and a measurement tool.



Pose normalization tool with 3D technology; frontal pose achieves better match results when compared to typical images in a mug shot database

 Demo videos and specification documents can be found at [www.cognitec.com](http://www.cognitec.com)

## Applications

### Criminal investigations

- identify suspects
- find missing persons

### ID management

- find duplicate faces in large photo databases
- prevent fraud and clerical errors

### Photo indexing and sorting

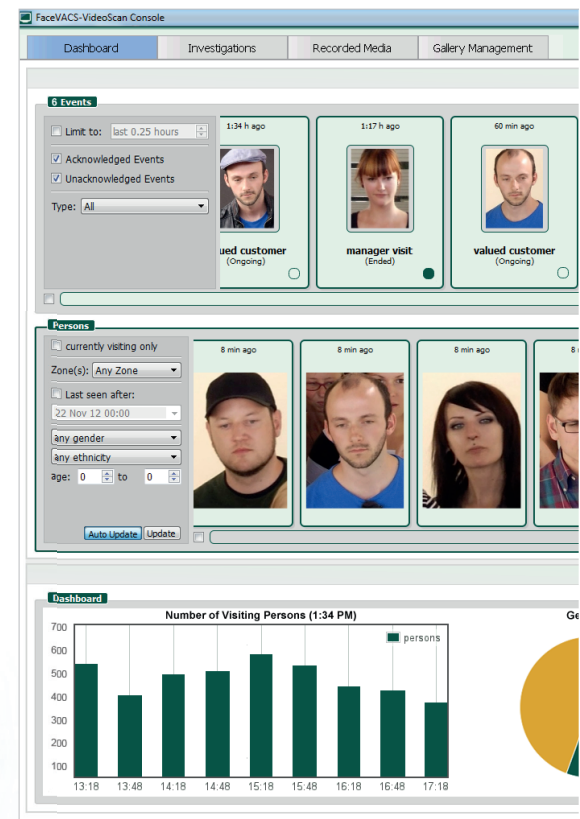
- search collections of digital images
- index photos automatically by face
- run on PC's or in the cloud

### Web applications

- compare facial photographs with image databases, e.g. of celebrities or user groups

# FaceVACS-VideoScan

- instantly detect, track, recognize and analyze people in live video streams or video footage
- store and view face streams for each appearance of a person over time
- use anonymous face recognition to compute people analytics while protecting privacy
- perform real-time comparisons to image databases and watch lists
- receive real-time signals when user-defined events occur
- define, view and export statistics about people flow, visitor demographics, and client behavior
- receive signals and statistics on mobile devices
- run as a stand-alone application or integrate into third-party solutions



## General features

- stores a high-resolution video sequence of the cropped face (face stream) for each appearance in front of a camera
- compares all appearances of persons against each other in real time and clusters identities
- uses Cognitec's latest face recognition algorithm for fast n:n comparisons to multiple databases
- supports anonymous face recognition for people analytics, intelligent signage, and people flow applications
- imports sets of video/image files for detailed investigations
- provides a clear user interface with expandable pop-up screens to view data details and live video streams

## Real-time event display

FaceVACS-VideoScan installs with a catalog of pre-defined event types. An event appears on the console screen and/or a mobile device if, for example:

- a person is matching a gallery image
- a person is matching certain criteria (e.g., male, Asian, 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)

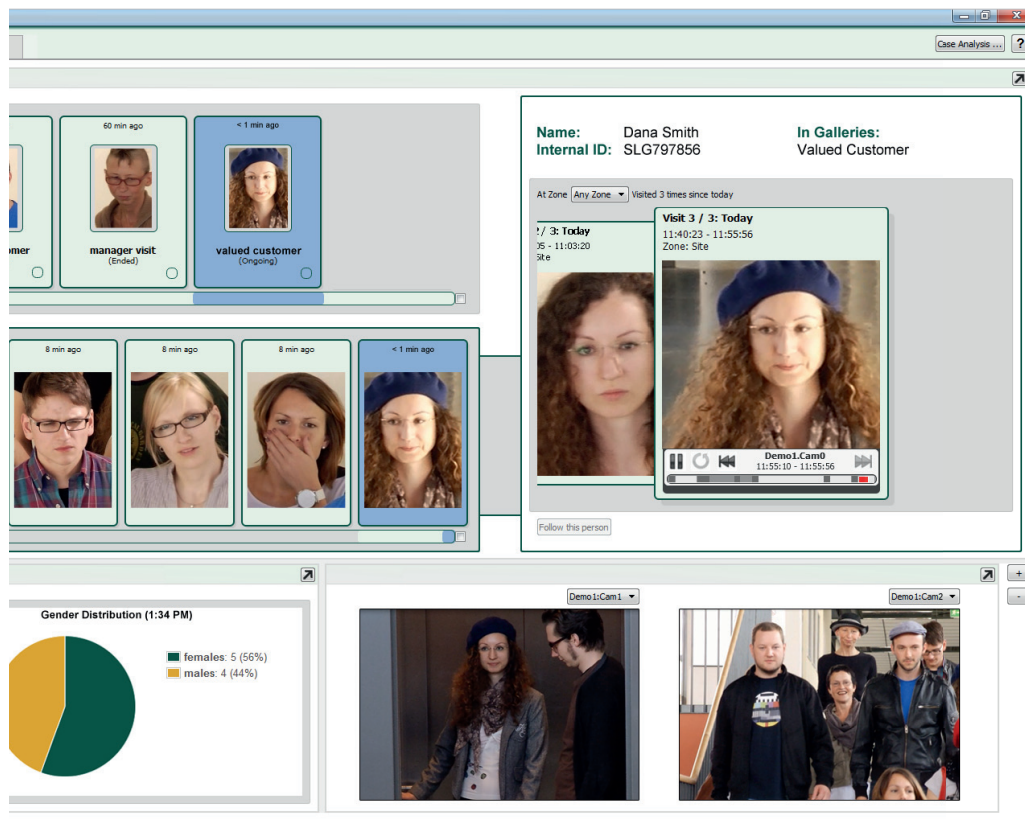
### Statistics

Users can configure data display for:

- count of individuals during a respective time window
- visit count in relation to visit length
- average transit time
- distribution of male/female visitors
- distribution of age groups



A configurable mobile client allows users to set up and receive event notifications on phones or tablets.



## Detailed investigations

- supports complex investigations of persons appearing in real-time camera streams and/or stored video material
- finds persons enrolled in an image database or unknown persons
- enables searches based on person, time, place, gender, age range, and more
- stores and reports investigation results

## FaceVACS-VideoScan C5

- combines face detection/tracking and camera technology in a single device
- provides high image quality of machine vision cameras while using bandwidth and network structures for surveillance cameras
- optimal integration with FaceVACS-VideoScan; migrates video processing intelligence of the stream processor into the input device



Demo videos and specification documents can be found at [www.cognitec.com](http://www.cognitec.com)



# 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

- perform anonymous face recognition to measure crowds and waiting/transit times in specific areas
- alert security staff, direct traffic, and enhance customer experience

## Intelligent signage

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

## Border control

- check videos recorded at border checkpoints against a watch list of undesired immigrants

## VIP recognition

- identify registered customers in clubs, banks or stores
- monitor access
- offer special treatment

# FaceVACS-Entry

- captures optimal facial images for fast, accurate identification processes
- compares live facial images to biometric photos stored in ID documents and/or facial images in databases
- performs instant biometric verification to allow entry to traveler or deny access
- integrates easily into eGates at airports, harbors and other border checkpoints



A demo videos can be found at [www.cognitec.com](http://www.cognitec.com)  
Please request product flyer and specification documents from our sales team at [sales@cognitec.com](mailto:sales@cognitec.com)



## Components and features

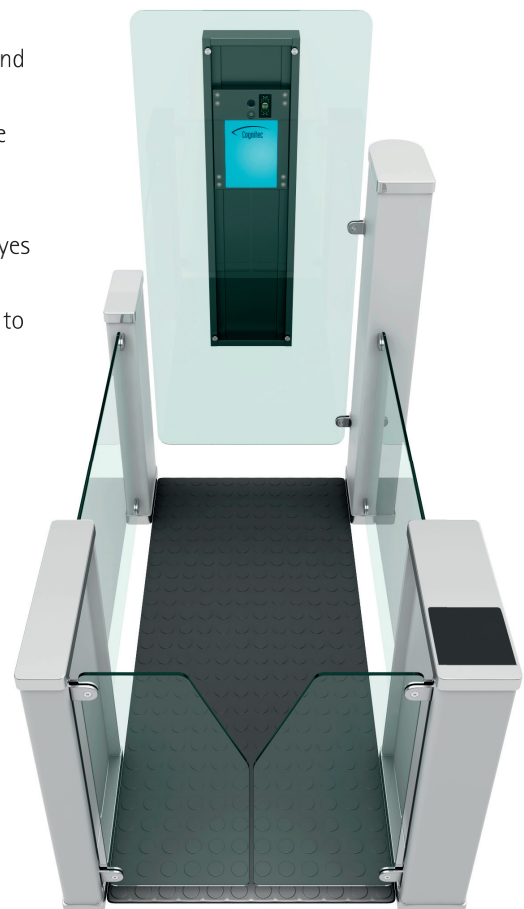
FaceVACS-Entry consists of the P5 panel (hardware and firmware) and the face recognition software Core, which incorporates Cognitec's latest matching algorithm.

### P5

- modular, flexible design
- mobile unit holds monitor, LEDs and video cameras
- monitor displays mirror live image and instructions
- performs measurements for face position, frontal pose, still gaze, eyes open and mouth open
- fast height adjustment according to face position
- proprietary sensor detects presentation attacks (masks, printed images, video material)
- installs onto certified glass surfaces or can be ordered with glass cover

### Core

- includes market-leading algorithm for optimal verification performance
- verifies live images against images in ID documents and/or facial images in databases
- triggers signal to instantly grant or deny access according to the person's security status
- includes user-friendly interface for easy integration



# FaceVACS-PortraitAcquisition

- streamline production of high-quality photos suitable for face recognition
- supervise and operate the acquisition process
- integrate self-service technology into kiosk applications
- store demographics with facial images
- assess key technical characteristics such as frontal pose, uniform lighting, glasses and open eyes
- check compliance with international standards for full frontal image type (e.g. ISO 19794-5 standard)
- integrate software into existing document issuing processes and applications



Demo videos and specification documents can be found at [www.cognitec.com](http://www.cognitec.com)

## FaceVACS Technology

- 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, and portrait characteristics check
- apply multiple algorithms
- use for many application platforms, from mobile devices to high-end servers

### Applications

- ID management
- access control
- border control
- VIP recognition
- photo indexing and sorting
- web application for photo gallery search
- phone, PC, and banking login
- intelligent signage
- automotive: driver recognition and safety
- humanoid/service robots



Specification documents can be found at [www.cognitec.com](http://www.cognitec.com).

# Reference Installations

Cognitec has collaborated with more than 2000 clients, value-added resellers and system integrators in more than 100 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:



© German Federal Police

## Border control

comparison of passport photo to the person's face at eGates (gate systems from various system integrators) at airports in the UK, Netherlands, Germany, Finland and Portugal



## Voter registration

de-duplication of voter registration image database in Africa (database size 5 million images)



## Security

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



## 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, the US, Canada and Germany, and for the national ID system in Mexico (up to 100 million images)



## 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 and Germany, and in the US by ten sheriffs' offices (database sizes range from 200,000 to 7 million)



## People flow management

real-time analytics and redirection of human traffic at Gatwick Airport (with 54 cameras) and London City Airport (with 10 cameras) via MFlow application developed by Human Recognition Systems



A more complete list of customers can be found at [www.cognitec.com](http://www.cognitec.com).

# About Cognitec

Cognitec was founded in 2002 by a team of experts who recognized the growing need for software solutions in the field of biometrics.

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. Cognitec still focuses solely on face recognition technology, which has allowed the company to maintain its leading position in the facial biometrics market.

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:

- Biometrics Institute
- European Association for Biometrics
- TeleTrust
- Silicon Trust
- IBIA
- NRF
- SIA

Official Supporter of the Biometrics Institute Privacy Charter.

Cognitec received the quality seal 'IT Security made in Germany', issued by TeleTrust.





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