

Aimetis Face Recognition delivers scalable and accurate face identification. A combination of patented 2D to 3D pose correction technology, used in conjunction with deep convolutional neural network algorithms, offers exceptional performance. The Aimetis Face Recognition analytic is equal to real-world challenges such as lighting, facial hair, pose, occlusions, motion, crowds, and expression. With a 128-byte template size, Aimetis Face Recognition is nearly three times smaller than similar software and requires less memory. The analytic delivers industry-leading speed and match accuracy at a low CPU cost. As a native analytic for Aimetis Symphony, Aimetis Face Recognition offers ease-of-use and intuitive integration across video management system (VMS) functions.

Key Benefits

✓ Fast Image Processing

Aimetis Face Recognition has registered a template correlation speed of 25 million matches per second (.040 microseconds/match), per core, against both live and archival video. This makes facial-biometric, multi-factor authentication possible and translates to accelerated response times for Security or Customer Relationship Management (CRM) use cases.

✓ Accuracy

Aimetis Face Recognition delivers results in less than ideal conditions. It performs in crowds, where faces are partially obstructed, and when facial appearance or expression has changed. It has achieved a 99.44% Rank 1 matching accuracy on the Facial Recognition Technology (FERET) high pose data set and a 97.60% Rank 1 matching accuracy on the Labeled Faces in the Wild (LFW) data set, with a false positive rate of 0.1%. You can rely on Aimetis Face Recognition for the most demanding applications.

✓ Lower TCO

Be in production immediately. Face Recognition is a native analytic, seamlessly integrated with Aimetis Symphony. Installation and configuration are simple and intuitive, leveraging a familiar interface, ready to use with key VMS functions. Aimetis Face Recognition maximizes server hardware efficiency. A dedicated analytic platform is not required. Both CPU and memory overhead are significantly less than competing solutions.

✓ Enhance Security

Combine Face Recognition with access cards to provide biometric, two-factor authentication. In retail, border security, and education settings, provide real-time security by immediately alarming on watch lists of known offenders. Comprehensive forensic analysis is possible through archival search.

✓ Improve User Efficiency

Stop manually sifting through hours of recorded video. Using search functionality, look for both known and unknown people, quickly get results, and immediately take action. Upload an image of a person of interest and automatically query recorded video to find each instance where they appear. Perform an iterative search starting with a low-quality initial image. Find a better image in the database, then use it to yield still higher confidence matches.



Alarm on Face

Aimetis Face Recognition: Applications

Identification - *Who is that person?*

Law Enforcement

- Mug books and booking systems
- Forensic imaging systems
- Watch lists for real-time face recognition from live video
- Safe city projects
- Forensic or post-event facial searches
- Health and human services
- Identifying undocumented individuals

Loss Prevention

- Identification of known shoplifters
- Pre-empting organized crime events
- Point of sale monitoring

CRM: VIP and Concierge Services

- Financial services
- Hospitality and casinos
- Retail

Marketing Analytics

Business decision support based on anonymized face recognition to compute people analytics and demographic data while protecting privacy

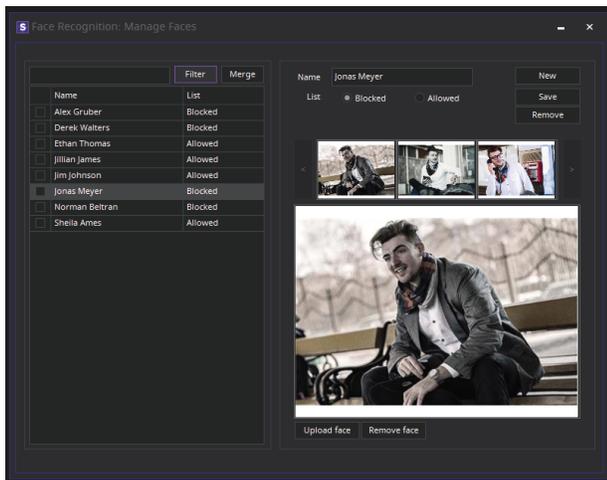
Verification – *Is the person who they claim to be?*

Physical Access Control

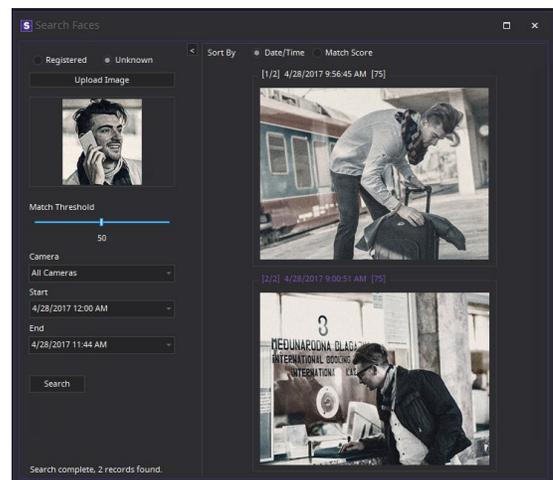
- Multi-factor authentication
- Entry to commercial offices, apartment buildings and schools
- Hospitals, manufacturers, and hosting facilities
- Police departments, correctional facilities, and courts
- Specialized secure areas like server rooms and pharmacies

Logical Access Control

- Multi-factor authentication
- Individual computer and network login
- Financial services and ATMs
- Healthcare provider segregation (HIPAA) and government benefit assistance
- Customs and border control
- Mobile transactions



Enrolling a user



Search

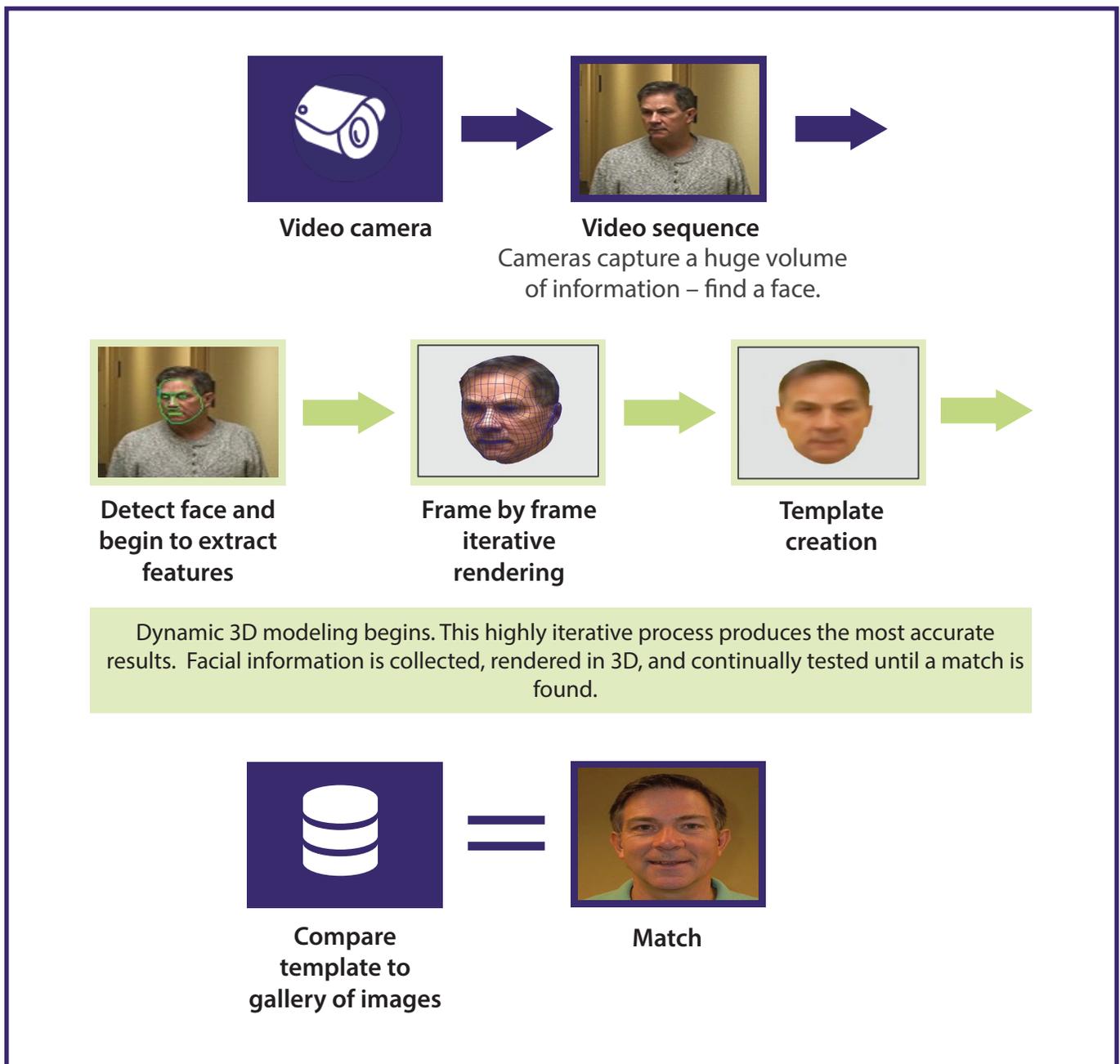
Solving Real World Face Recognition Challenges

Given an unknown face, a computer system attempts to identify the person.

That process is broken into three main tasks:

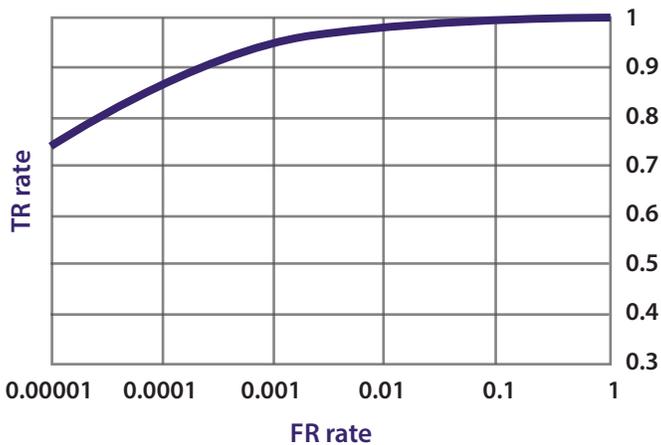
- **Face detection** - distinguishes face-like objects from other objects in the image
- **Feature extraction** - reduces the face to its simplest terms for recognition
- **Face identification** - identifies the person's face by searching a database of known individuals

3D Face Matching Algorithm

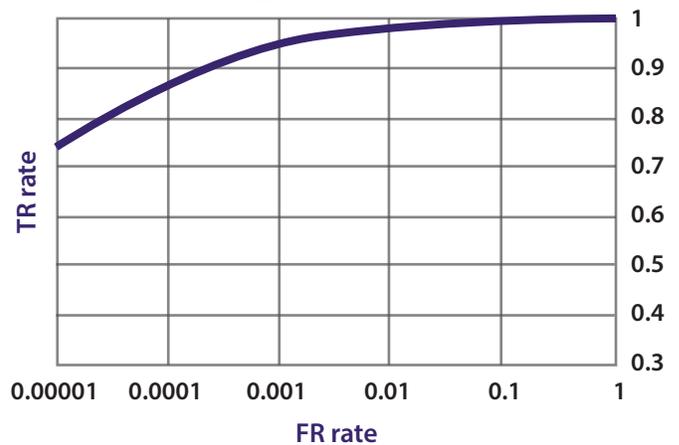


Technical Specifications

LFW ROC



FERET High Pose ROC



The Labeled Face in the Wild Dataset

The Labeled Face in the Wild dataset contains more than 13,000 images collected from the web. Our test results presented here are based on a closed set test (every image compared to every other image). The test set consisted of every person with 2 or more images for a total of 9,126 images and more than 83.2 million comparisons.

Technology	
Automatic feature (eye, nose, mouth) detection	Yes
Automatic face detection	Yes
Face tracking	Yes
Real-time video capable	30 fps
Recorded video search	Yes
1:1 Matching	Yes
1:n Matching	Yes

Matching Engine	
Pose - Yaw	60°
Pose - Pitch	20°
Pose - Roll	30°
Partial facial occlusion	Yes
Beards and hairstyles	Yes
Large expressions	Yes
Sunglasses	Some
Irregular lighting	Yes

Minimum Image Characteristics	
Minimum distance between the eyes	29 pixels
Minimum grayscales within the face	32

The FERET Dataset

The FERET dataset is a curated collection of images of 957 individuals in quarter, half, and full profile poses. For our closed set testing we selected the subset of high pose (quarter and half profiles but excluded full profiles) for a total of 7,830 images producing more than 61.3 million comparisons.

Templates	
Template Size	128 bytes
Template generation speed	10 per second
Template comparisons	0.040µs
Generation re-entrant thread safe	Yes

Benchmark Hardware Specifications	
CPU Speed	3.4GHz
Memory	2GB
1M person gallery stored in RAM	125MB

Performance	
Matches per second, per core	25M
False positives	0.1%
Rank 1 matching accuracy on Facial Recognition Technology (FERET) high pose data set	99.44%
Rank 1 matching accuracy on Labeled Faces in the Wild (LFW) data set	97.60%