WHITEPAPER

FACIAL RECOGNITION FOR GOVERNMENT

FACEFIRST

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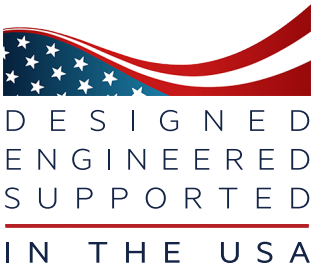
Facial recognition is a new and important capability for national security, public safety, citizen enablement and more. Government organizations can now identify persons of interest with real-time, accurate and scalable technology from a variety of environments.

This capability provides government and law enforcement with new advantages to mitigate risks while enhancing operational effectiveness. The technology automates manual identification processes that currently require a significant amount of time and effort. Benefits of automated and accurate facial recognition are cost savings, closed cases and safer communities. Government leaders have identified biometrics as strategic to national, mission and citizen interests and facial recognition is a key capability within these initiatives.

> Face recognition benefits include cost savings, more closed cases and safer communities

FaceFirst is leading the way by providing government organizations with proven technology supporting the use cases detailed herein. For years, federal, state and local agencies have partnered with FaceFirst to achieve successful outcomes using real-time facial recognition. FaceFirst is a well-qualified and innovative technology company dedicated to serving the needs of government and law enforcement seeking best-of-breed facial technology solutions. FaceFirst is designed, engineered and supported in the USA.



BRIEF HISTORY OF FACE RECOGNITION

1960s	First manual measurements created using electromagnetic pulses
1970s	21 points of measurement agreed upon by major researchers
1988	100 points of measurement applied using linear algebra
1991	First crude automatic face detection from images
1993	Defense Advanced Research Projects Agency (DARPA) created the first basic database of facial images
2002	A database of 856 people was used at Super Bowl XXXV. The experiment failed
2003	DARPA database upgraded to 24-bit color facial images
2004	National Institute of Standards and Technology (NIST) test created
2009	Pinellas County Sheriff's Office creates forensic database
2010	Facebook begins implementing face recognition to auto-tag images
2011	Panama Airport installs first face recognition surveillance system
2011	Body of Osama Bin Laden positively identified via face recognition
2012	16,000 points of measurement used in Cognitec algorithm
2013	FaceFirst achieves effective mobile deployment speeds
2014	ARJIS deploys cross-agency system in southern California
2016	U.S. CPB deploys exit face recognition at Atlanta Airport
2017	150,000 points of measurement used in FaceFirst algorithm
2017	iPhone X breaks sales records with face recognition access control

GOVERNMENT APPLICATIONS & USE CASES

Facial recognition provides the positive identification of an individual from a dataset or watchlist. This can be achieved with the help of a variety of applications and conditions. In each use case, an effective facial recognition platform must be secure, deliver results in real-time and be scalable.

Mobile

Mobile facial recognition is available by downloading an app for iOS and Android smart phone devices. The user takes a photograph of the person of interest and a result is immediately returned. A positive identification is accompanied by metadata associated with the person and their case history. Persons of interest can also be captured by photograph and immediately enrolled into the watchlist database for investigative and case management purposes.

Common use cases for federal, state and local law enforcement are verifying identity of uncooperative suspects, suspects without government-issued identification, and generating positive identification when a language barrier inhibits traditional methods of identification. Mobile facial recognition images can be taken from a safe distance.

Capture Image

An image is captured by a mobile device in the field.

Analyze & Compare

Images are instantly analyzed and compared to a database of enrolled images of individuals that pose a threat to public safety. Images are then “scored.”

Push Instant Notifications

Positive matches are instantly pushed to mobile devices to provide them with actionable intelligence.

Actionable Analytics

Data is accumulated and analyzed, yielding a multitude of actionable reports and analytics, which can aid missions and enhance investigations.

Surveillance

Surveillance-based, non-cooperative facial recognition provides automated and actionable intelligence. This is significant advancement from the limited capabilities of CCTV and video, and the application is used to identify individuals located within public and sensitive areas. As an individual or group enters the focal point of a camera, the facial recognition system detects faces and matches them at a rate of 25 million images per second. In the event of a positive identification, a real-time alert is generated and sent to a mobile device, portal, email or any third-party applications required by the government organization.

> FaceFirst uses 150,000 points of reference on a face when establishing identity

This application is ideal for identifying individuals at facility perimeters, in public areas and where threat actors may target individuals and institutions. Ports of entry and public transit are increasingly leveraging surveillance-based facial recognition to identify persons of interest and it can be used to provide enhanced citizen services such as streamlined travel experiences.

Capture Image

Cameras are positioned to detect and track potential threats to government facilities, public spaces and sensitive areas.

Analyze & Compare

Images are instantly analyzed and compared to a database of enrolled images of individuals that pose a threat to public safety. Images are then “scored.”

Push Instant Notifications

Positive matches are instantly pushed to mobile devices to provide them with actionable intelligence.

Actionable Analytics

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25 MILLION
NUMBER OF FACES FACEFIRST CAN SEARCH AND MATCH PER SECOND

5
SECONDS IT TAKES TO ALERT PATROL OFFICERS WHEN THERE IS A MATCH

30
FRAMES PER SECOND
SPEED AT WHICH AI DETERMINES OPTIMAL ENROLLMENT IMAGES

150,000
FACIAL POINTS OF REFERENCE USED IN ESTABLISHING A PERSON'S IDENTITY

Forensic Capabilities

Forensic capabilities are an important component of a facial recognition platform, and automating the identity matching process from video and image sources is more operationally effective than manual identification. This is particularly impactful when government and law enforcement must quickly process vast amounts of data to locate persons of interest. The application can be leveraged as an integration to many video management systems (VMS) already deployed for surveillance and analysis purposes.

Government employees are frequently inundated with video following criminal events. The forensic capabilities of facial recognition can accelerate the investigative process and deliver a return on investment (ROI) for government and law enforcement.

TECHNOLOGY AND PERFORMANCE

FaceFirst provides key product and performance qualities essential for dependable mission and law enforcement support. These technology differentiators are necessary to enterprise class performance and program success.

Mission-Grade Speed

FaceFirst can search and match against 25 million faces per second. This metric outperforms competing products and is fundamental for successful enterprise deployments.

Accuracy

FaceFirst uses approximately 150,000 points of reference on a face when establishing identity; this is approximately 5 times more than the Apple iPhone uses to authenticate users. These metrics enable higher match rates and system accuracy.

Advanced Artificial Intelligence

FaceFirst uses a machine-trained algorithm to select the optimal enrollment image from live video. Factors such as face angle, lighting, expression, sharpness and others are all calculated, considered and processed at 30 frames per second.

Instant Alerting

FaceFirst is a real-time facial recognition solution. Positive match identifications are delivered in seconds to FaceFirst mobile, platform, email distribution and third-party systems. This provides actionable intelligence for government to take the right action at the right time. Notifications can be configured to segment alerts to individuals, groups and enterprise-wide.

Interoperability

The FaceFirst Platform is engineered to interoperate with existing and third-party technologies and can be deployed as a wholly contained solution, or integrated into existing video management systems (VMS), intelligence platforms, analytics platforms and solutions that consume REST API communications. FaceFirst is

capable of seamlessly enhancing and automating existing technology and business processes.

Data Security

Application and data security are fundamental to the FaceFirst Platform. Government organizations and end users can be confident that data is secure:

- **Encryption** – biometric data is encrypted at rest and during transmission
- **Data breach precautions** – biometric templates stored within the FaceFirst system cannot be converted back into a face image in the case of a data breach
- **Data purging** – biometric data can be purged according to strict timetables
- **Checks and balances** – role hierarchies ensure only authorized individuals can approve and view enrollment images within the FaceFirst system

CUSTOMER SUCCESS STORIES

CASE STUDY: AUTOMATIC REGIONAL JUSTICE INFORMATION SYSTEM (ARJIS)

The Automated Regional Justice Information (ARJIS) was created as a Joint Powers Agency to share information among justice agencies throughout San Diego and Imperial Counties, California. ARJIS has evolved into a complex criminal justice enterprise network used by 80+ local, state, and federal agencies. ARJIS is responsible for major public safety initiatives, including wireless access to photos, warrants, and other critical data in the field, crime analysis tools evaluation, and an enterprise system of applications that help solve crimes.

The Challenge

- Radically reduce the process of identifying persons of interest in the field
- Ensure dangerous fugitives don't slip through the cracks
- Break through language barriers during the ID process
- Minimize false arrests

The Solution

- Mobile facial recognition

The Results

- 12,000+ police actions resulting from field matches and counting
- Reduces field investigation process from hours to seconds, saving officers hours of productivity each week
- Expansion to dozens of local, state and federal agencies including San Diego PD, FBI, DEA, ATF, CBP, DOJ and U.S. Marshalls
- Zero legal or privacy complaints from the community

Study Details

After a 35-year career in peace officer service, ARJIS analyst Lloyd Muenzer began analyzing technological solutions to facilitate data sharing among federal, state and local law enforcement agencies in San Diego County and surrounding areas. His first task was challenging: find a way to help patrol officers from a variety of agencies and departments positively identify suspects in the field.

When stopping persons of interest, patrol officers often met individuals claiming not to have identification. Verifying identity in such scenarios required verbal descriptions to be matched against a database manually; that was often a time-consuming and imprecise effort. The challenge was compounded when persons of interest did not speak English.

To solve this problem, Muenzer began conducting a market analysis of facial recognition vendors. While evaluating facial recognition solutions, he became impressed with FaceFirst. After a successful Pilot, Muenzer was instantly impressed. “People were having really, really good success with FaceFirst. I realized then how much potential this technology has.”

CASE STUDY: TOCUMEN INTERNATIONAL AIRPORT

Tocumen International Airport (IATA: PTY, ICAO: MPTO) is the international airport of Panama City, the capital of Panama.

The Challenge

- Prevent terrorism and violent crime by proactively detecting potential criminals before they act
- Enforce border control by matching passengers as they enter arrival terminals
- Track and apprehend regionally and internationally wanted individuals
- Enable geo-fencing of authorized persons throughout the airport

The Solution

- FaceFirst Surveillance Based Facial Recognition

The Results

- An average of 30 persons of interest are identified daily against an Interpol watchlist
- Expansion of the system into additional airport facilities

Study Details

Tocumen International Airport processes a high volume of travelers from all over the world. In 2010, however, the airport was a known hub for illicit activity including drug smuggling and organized crime. Though traditional security cameras were already in place, it was clear that more sophisticated measures were needed to make Tocumen Airport a safer airport for passenger and cargo transportation.

As a result, in 2011, Panama commissioned a FaceFirst evaluation. The ensuing trial proved FaceFirst could dependably identify faces within the airport. FaceFirst was the only vendor able to overcome the suboptimal lighting conditions and glare common to airports. Shortly after implementation, the system resulted in the apprehension of multiple wanted suspects. Pleased with the success of the initial deployment, Panama expanded FaceFirst's deployment into the facility's north terminal. The FaceFirst implementation at Tocumen remains the largest and most successful surveillance facial recognition deployment in the Americas.

ABOUT FACEFIRST

FaceFirst is a global patented face recognition platform used by government agencies, local law enforcement, airports, military bases and more for intelligent threat detection. Using artificial intelligence and machine learning, FaceFirst offers a full range of biometric surveillance, mobile, access control and desktop forensic face recognition capabilities for a wide range of needs, including threat prevention, national security, rescue missions, geofencing, border control and more. The FaceFirst API also easily integrates with existing data and technology systems.

Learn more at FaceFirst.com