MegaMatcher 2.0
Case Study

NEUROtechnologija

El Salvador's National Passport System
Implemented by General Security, Based on MegaMatcher 2.0 Technology

General Security El Salvador S.A. de C.V selected MegaMatcher 2.0 to provide the core multi-biometric functionality for the Republic of El Salvador's first nationwide multi-biometric passport and immigration system.

With a growing population, an expanding economy and increasing world trade, the government of El Salvador required a sophisticated, national-level biometric solution for passport administration and civil and forensic applications. While multiple identification systems existed within public and private entities in El Salvador, the government lacked a broad, nationwide database for the issuing of passports and other immigration and security functions. The biometric identification systems that were in place were limited in scope and based on index finger matching alone.

The government of El Salvador engaged General Security El Salvador S.A. de C.V. to develop and implement a new national system that would incorporate multi-biometric face and fingerprint identification and could be used in a variety of civil, security and forensic applications.

General Security knew that this new system would require a powerful, multi-biometric identification algorithm with a high degree of reliability and versatility. They selected MegaMatcher 2.0 SDK from Neurotechnologija to provide the core multi-biometric functionality for their new GS AFIS solution.

In September 2007 General Security began deploying El Salvador's new national passport system based on MegaMatcher 2.0 multi-biometric technology. The new system is being implemented for passport control and other immigration functions at the country's borders and in El Salvador's consulates worldwide. Additionally, components of the GS AFIS solution are being deployed across other governmental departments for use in conducting criminal history and background clearance checks, for registration of inmates and visitors in detention centers and for criminal and forensic applications.

Background

◈ **The company:** General Security El Salvador S.A. de C.V., based in San Fernando, El Salvador, provides security products for police, military, tactical and forensic use.

◈ **The customer:** The Republic of El Salvador is the most densely populated nation in the mainland of the Americas with a population of 6.9 million people in an area of 21,041 sq km (8,124 sq miles).

◈ **The need:** The government of El Salvador selected General Security to implement the country's first nationwide multi-biometric passport and immigration system.

◈ **The solution:** GS AFIS Version II is based on Neurotechnologija's MegaMatcher 2.0 multi-biometric AFIS/fingerprint and facial recognition technology.

◈ **The implementation:** Since implementation of the national passport solution began in September 2007, El Salvador's national database has been growing at a rate of 2,000 new people per week.

◈ **The reach:** GS AFIS is now being deployed in multiple governmental departments, including El Salvador's Ministry of Foreign Affairs and subdivisions of the Ministry of Public Security and Justice, including the General Directorate of Penitentiaries and the General Directorate of Migration.

National-level AFIS and multi-biometric identification systems help governments provide a higher level of security for their citizens, visitors and trade partners in the global economy. As the citizens and businesses of El Salvador and other growing countries engage in more international travel and trade, the need for secure, accurate, national-level systems for identification of citizens and visitors becomes ever more important. In the past, the implementation of national-level identification solutions posed significant challenges for many growing countries because of the complexity and high cost of large-scale biometric systems.

Today, the development of fast, accurate and cost-effective multi-biometric identification engines like MegaMatcher 2.0 are making this advanced technology more accessible and easier to implement. This helps countries like El Salvador more rapidly deploy national-level systems that not only provide an extra measure of security for their own citizens but also help the countries participate more actively in global affairs. These systems can be integrated with other international databases, such as those used by the FBI and Interpol, to help with the identification of international criminals, providing an extra measure of security for individuals, businesses and governments engaging with these countries for tourism, trade and international relations.

> *"Our current and future projects for the government of El Salvador involve a high level of complexity, both in their design and implementation. The quality of the multi-biometric technology in MegaMatcher 2.0 and the high level of support we receive from Neurotechnologija are helping us continue to meet and exceed the levels of robustness, speed and versatility required by our government customers."*
>
> – Ricardo Ernesto Ramirez
> Technology and Operation Manager,
> Director of the Board
> General Security El Salvador

When fully implemented, El Salvador's national multi-biometric identification system will offer a number of benefits:

◈ Enabling a faster, easier more accurate way to process citizens and visitors crossing the country's borders.

◈ Ensuring the reliability and security of the country's national database by using multiple identification methods – physical documentation (passports), fingerprints and facial recognition.

◈ Providing an extra measure of security for El Salvador's citizens and visitors by enabling identification even when a passport or other documentation is not available.

◈ Securing the privacy of individuals by using multi-biometrics to reduce identity fraud and theft.

◈ Enhancing public safety by facilitating the identification and documentation of criminals and forensic evidence in crime scenes.

A strategic approach to implementation is enabling El Salvador to develop a robust national database with immediate applications for immigration and criminal justice. The first two areas in which El Salvador chose to implement the new GS AFIS solution are for passport administration and in the criminal justice system. By focusing initially on these two areas for registration of citizens, El Salvador is able to rapidly populate the national database with information that is immediately relevant and useful for immigration and security purposes.

Passports

All citizens applying for a new or renewed passport in El Salvador are now required to register their photo and 10 fingerprints into the national database. This information is checked against the database to determine if the person is a citizen, if a passport has been issued in the past, if they have already been enrolled under a different I.D. and if they have a criminal record. If the person has not been registered in

the past, their biometric information is enrolled in the system. If they have already been enrolled, their identity is verified and a passport is issued or renewed.

In the future, all individuals entering El Salvador at the borders or in the country's consulates worldwide will submit their face and fingerprints for identification and verification against the national database.

Criminal Justice System

All employees, inmates and inmates' visitors in El Salvador's criminal justice system are being enrolled in the national database. For prison employees, biometric information is being used for time and attendance. As new prisoners are booked their photos and 10 fingerprints are registered in the system. Once in the system, the facial and fingerprint data can be used for the identification of individuals involved in criminal activity and for the identification of forensic evidence, such as latent fingerprints at crime scenes.

About GS AFIS

Capabilities of the MegaMatcher-based GS AFIS solution include:

- ◈ Fingerprint enrollment from a live fingerprint scanner and ten-print-card form.
- ◈ Face enrollment from a camera.
- ◈ Prevention of duplicated biometrical data enrollment.
- ◈ Person verification and identification using face and fingerprint data.
- ◈ Multiple system user roles (enrollment only, identification, registration, etc.).
- ◈ Time and attendance registration.
- ◈ Latent fingerprint enrollment and identification capability (using whole fingerprint database).
- ◈ Expandable system architecture that supports a large number of total workstations and allows easy addition of new workstations.
- ◈ Ability to increase whole system performance by increasing MegaMatcher cluster size.

> *"We had the opportunity to work with Neurotechnologija's biometric fingerprint technology several years ago, so we knew they offered efficient technology, good technical support and competitive prices. When it was time for us to invest in a biometric SDK for our GS AFIS product, we knew Neurotechnologija's MegaMatcher would enable us to build a robust and reliable system that requires minimal maintenance."*
>
> – Ricardo Ernesto Ramirez
> Technology and Operation Manager,
> Director of the Board
> General Security El Salvador

About MegaMatcher

MegaMatcher SDK is designed for the development of large-scale automated fingerprint identification systems (AFIS) and multi-biometric face-fingerprint identification systems. MegaMatcher includes both fingerprint and face identification engines with a fusion algorithm that allows the two technologies to work together to provide very fast 1:N (1 to many) matching with even higher reliability than AFIS or facial recognition alone.

MegaMatcher's powerful fused algorithm can produce up to 400,000 matches per second on a single processor PC; and with MegaMatcher 2.0's fault-tolerant, scalable cluster software, this number can be multiplied across multiple PCs to perform extremely fast, parallel fingerprint and face matching using databases of practically unlimited size. MegaMatcher's latent fingerprint template editing capabilities also allow it to be used in forensic AFIS applications.

The MegaMatcher 2.0 fingerprint engine has received full NIST MINEX Certification for use in government applications.

For more information:

General Security El Salvador

For more information about General Security El Salvador and their products, email: admin@generalsecurityelsalvador.com or go to: http://www.generalsecurityelsalvador.com.

Neurotechnologija

For more information about MegaMatcher pricing, product capabilities and specifications as well as other products from Neurotechnologija, go to: http://www.neurotechnologija.com

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