

 **OEM Solutions**

Top-Ranked Fingerprint  
Matching and Facial  
Recognition Algorithms  
Portable to Any Hardware

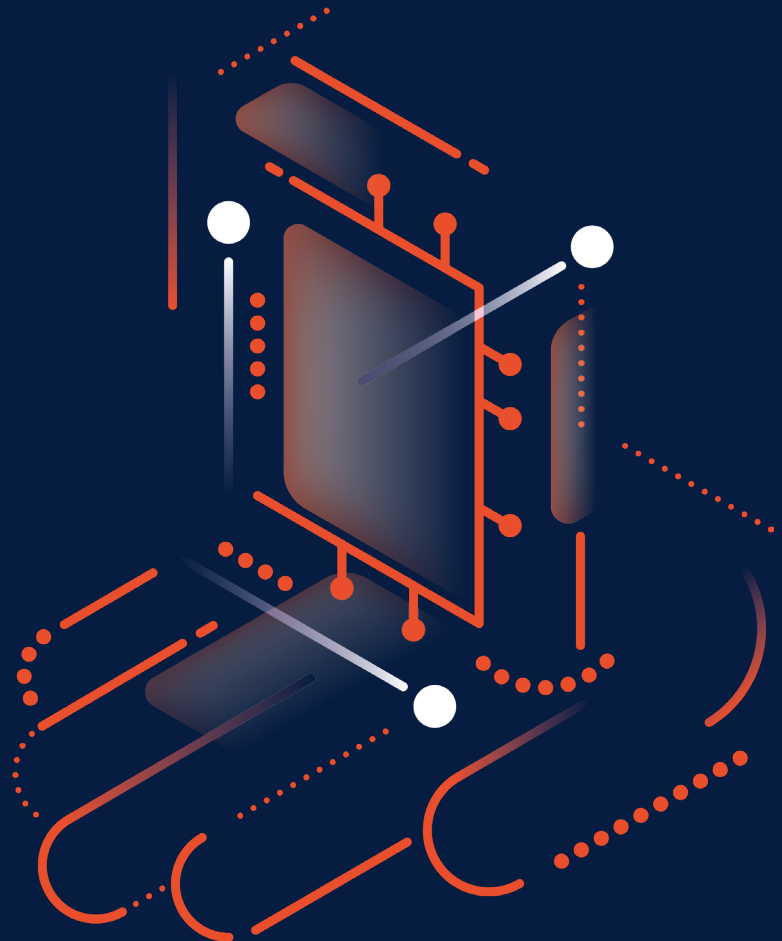
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Datasheet

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# Small Footprint With High Performance

Access Control and Management / Smart Device Security / Embedded Platforms



# Top-Ranked Technology

Innovatrics' proprietary fingerprint and face recognition algorithms have long been some of the fastest and most accurate in the world.

Any Windows, Linux, or Android platform is able to run Innovatrics OEM solutions, along with a number of other OSs and platforms.

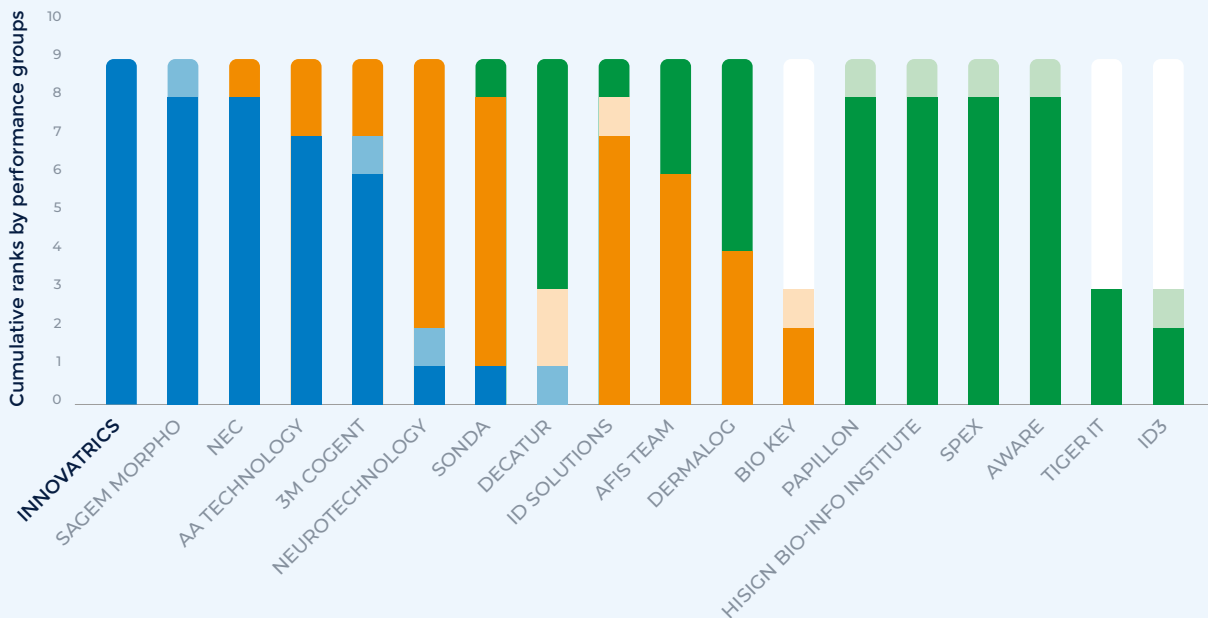
## Fingerprints

In fingerprints, Innovatrics is a top performer in NIST tests. It is the only company that has consistently earned a spot on the leaderboard in all of the NIST conducted tests. The algorithms are not only fast and accurate, but also utilize fixed-point calculations, which are useful in a mixed-platform environment or with low-performance elements.

The solution is fully interoperable through ANSI/ISO standards. Likewise, Innovatrics' algorithms are top performers in Minex III interoperability tests. They are also compliant with STQC certification for the Indian Aadhaar ecosystem.

### Innovatrics is a top performer in all relevant fingerprint tests

■ Top performance (80th percentile)   
 ■ Low performance (below 55th percentile)   
 ■ Mid performance (55th - 80th percentile)   
 ■ Not available  
■ Top performance - Slow   
 ■ Low performance - Slow   
 ■ Mid performance - slow



# Embedded Face Recognition

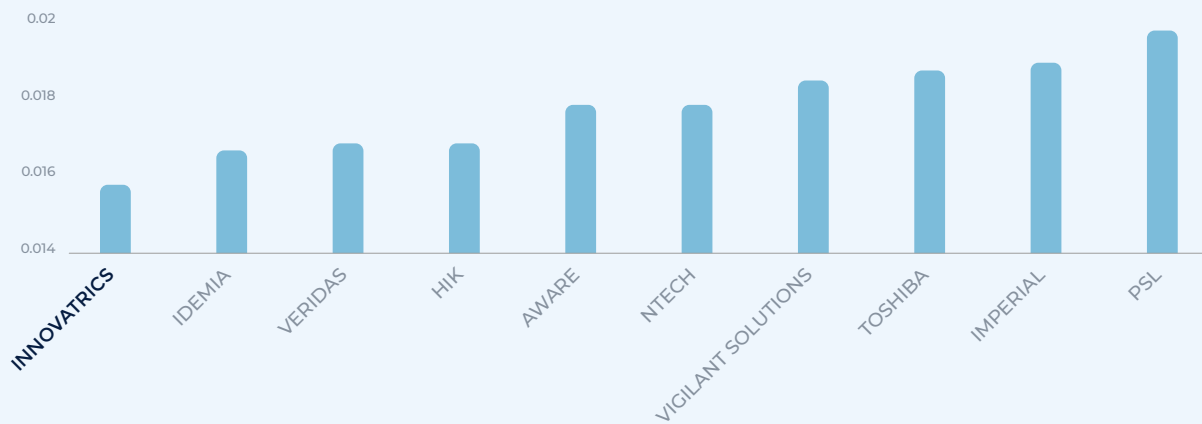
Technological advances allow the use of compact platforms even for face recognition. In fact, Innovatrics IFace SDK is able to run off stock Raspberry Pi 3, a \$35 minicomputer running Raspbian Linux OS.

As a result, face recognition can now be embedded in cheap, widely available platforms, allowing its widespread use in a wide variety of use cases.

## Face recognition algorithm accuracy - Global Top 10

(FRVT 1:1 Results, Wild Faces Dataset, FNMR 0.005)

Source: NIST FRVT REPORT, April 4th 2019



## Supported Modalities

SDK	Fingerprint	Face
IDKit	✓	
IDKit Multi	✓	✓
IFace		✓
ANSI & ISO	✓	

## OEM SDKs

Through Innovatrics SDKs, our customers are given access to top-ranked fingerprint matching and face recognition algorithms. Thanks to our expertise in porting SDKs, we are able to port our libraries on any hardware. The algorithms make extraction, verification and identification basically instant even on constrained hardware. Their footprint is kept intentionally low to utilize the widest variety of hardware platforms.

These features allow our embedded algorithms to work in access control terminals, smartphone fingerprint sensors and small area sensors embedded in credit cards and in many other devices. The support of ANSI/ISO standards makes devices with embedded SDKs highly interoperable.

Even face recognition is now available on compact platforms and in smartphones, making the technology accessible to mainstream applications.



### Fingerprint SDKs

- 1:1 and 1:N fingerprint matching
- Very small footprint and low RAM requirements
- High-performance algorithms
- ANSI/ISO and proprietary templates
- Support for all standard image formats, compressed or raw



### Face Recognition SDKs

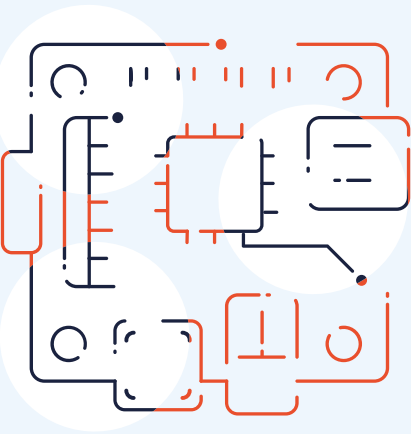
- Face detection & template extraction
- Low hardware requirements
- Small footprint
- High-performance algorithms
- Identification & verification

# Key Advantages



## 1. Sensor Independence

Innovatrics OEM SDKs are built to support a **wide array of sensors** instead of locking customers into a pre-selected hardware. The algorithms support **all standard image formats**, both compressed and raw. They can be obtained in all forms - from optical to capacitive, ultrasonic to thermal, allowing the use of Innovatrics fast-performing algorithms in the widest variety of devices and use cases.



## 2. Easy Portability

Innovatrics is experienced with porting its SDKs to **different platforms**, from Windows and Linux to iOS and Android to various ARM processors. The algorithms have been **designed with porting in mind**, so given the detailed specifications of a target platform, Innovatrics is able to recompile the libraries for almost any hardware. Due to small overhead, they are able to perform efficiently even in a RAM constrained environment.



## 3. Small Area Matching

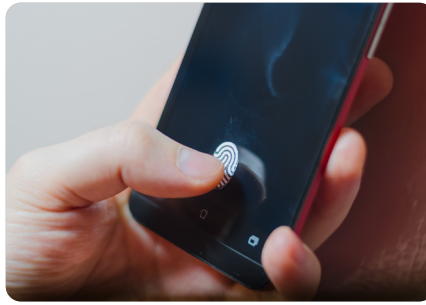
Owing to the current state of the technology, our algorithms can be embedded into credit cards and use small area sensor for matching enrolled fingerprints. The result is a card that does not need a PIN code to verify the identity of the holder. The algorithm of the matcher can be **customized according to the risk preferences** of a service provider.

## Use Cases



### Access Control and Management

Many devices already include fingerprint or even iris sensors, making them ideal targets for Innovatrics OEM algorithms. These terminals can provide both security and access control functions while getting rid of access cards and risks of their misuse.



### Smart Device Security

Due to their easy portability, Innovatrics algorithms can be easily embedded into smart devices in IoT ecosystems. They are already a part of smart locks that use both fingerprint and iris recognition, but can provide fast and seamless authentication with other devices as well, further increasing their security.



### Embedded Platforms

Small footprint of Innovatrics algorithms makes them the ideal candidate in cases where storage and performance are scarce. Innovatrics algorithms have already been implemented in credit cards that provide fingerprint authentication instead of PIN. The same can be done, e.g., for access cards without the need to exchange card-reading terminals.

## Why Innovatrics?

### Independent

Having a respected, innovation-driven R&D team allows us to develop proprietary technology that fits market trends and specific customer needs. Open architecture of our solutions allows smooth integration with other systems, avoiding vendor lock-in.

### Experienced

To date, we have successfully completed over 500 projects in 80 countries, with over a billion people having been biometrically processed using Innovatrics software. We have been consistently ranked among the fastest and most accurate in independent NIST tests.

### Supportive

We believe in quality. We guarantee and maintain the technological edge of our products and services through continuous research and professional staff. Our customer-driven approach guarantees real-time support to ensure that your system keeps working flawlessly.

## Technical Specifications

### Experience with Porting to these CPUs

- ARM architecture: ARMv3, ARMv4, ARMv4T, ARMv6, ARMv7
- ARM family and core: Cortex M4, Cortex A7, Cortex A53
- Strong ARM
- Snapdragon
- XScale
- Samsung S3C2416
- MIPS I & II and others...

### OS Compatibility

- Embedded Linux
- Android 2.2 and higher
- Apple iOS
- Real-time Operating System (RTOS)
- No OS
- uCos
- Others (analysis required)

## Benchmarks

### Fingerprints

- ISO template extraction: 565 ms, Verification: 46 ms (ARM Cortex M4 180 Mhz, 256 kB RAM)
- Proprietary template extraction: 65 ms, Identification (1:10000): 105 ms, (4xARM Cortex A53 1.2GHz, 1 GB RAM)

### Face Recognition

- Face detection: 236 ms, Template extraction: 706 ms (Stock Raspberry Pi 3)
- Face detection: 110 ms, Template extraction: 293 ms (Qualcomm Snapdragon: 8x ARM Cortex A53, 1 GB RAM, custom aarch64 Linux OS)

## Hardware Requirements

### Minimum HW Requirements\*

Fingerprints	CPU	RAM
Template Extraction	150 MHz	400 KB
Verification	180 MHz	400 KB
Identification	600 MHz	2 MB (per 1,000 templates in DB)

Face	CPU	RAM
Detection, extraction and verification	800 MHz	60 MB

\*Even platforms that fail to meet recommended hardware requirements can be ported to. This requires prior consultation and analysis of the hardware by the Innovatrics engineering team.

### Minimum Flash Memory Requirements\*

(Innovatrics SDK library size)

- ANSI&ISO SDK: 650 kB - 1 MB
- IDKit SDK: 2 – 2.5 MB
- IFace SDK: 20 MB
- IDKit Multi: 25 MB

## Licensing

Licensing can be agreed individually according to needs of the client and the deployment process. For your quote, please contact sales@innovatrics.com. We are able to provide licensing in a variety of forms, including license files based on hardware ID or application ID (for Android and iOS), in-memory licenses, handshake licensing, etc. They can be delivered through our CRM portal or via CRM REST API.

## About Us

We are an independent EU-based provider of multimodal biometric solutions. Our algorithms consistently rank among the fastest and most accurate in fingerprint and face recognition. For over 15 years, we have partnered with all types of organizations to build trusted and flexible biometric identification solutions. Our products are being used in more than 80 countries, benefiting more than a billion people worldwide.

### Contact

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