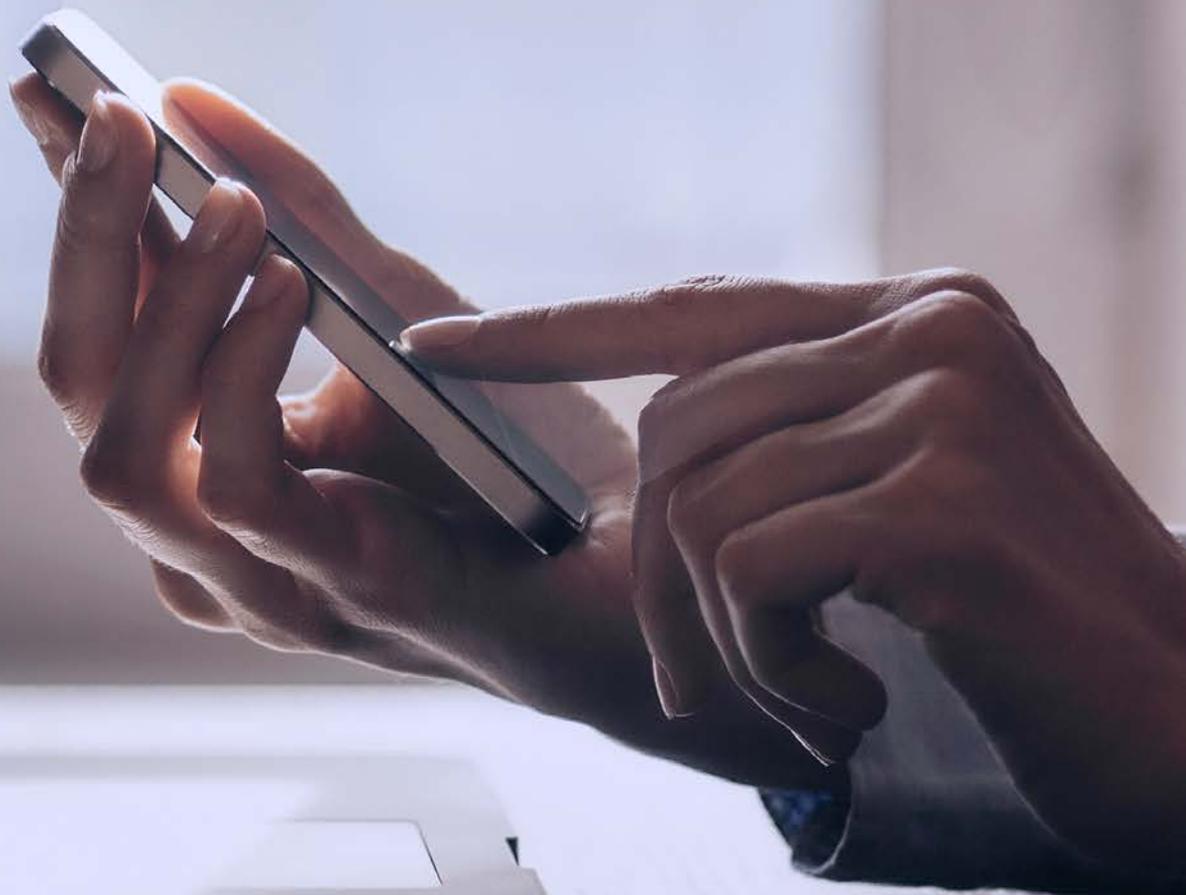


# BioSign 3.0

World's Best Mobile Fingerprint  
Authentication Algorithm



**suprema**

# WHY BioSign 3.0?

## WORLD'S FASTEST SPEED

50ms\* authentication time

## WORLD'S MOST ACCURATE ALGORITHM

FRR=0.5%@FAR=0.0005%

## ROBUST PERFORMANCE OVER TIME

Gets smarter with use  
- Self learning algorithm

## FLEXIBILITY IN DESIGN

Supports wide selection of  
sensor types & form factors

\* Conditions apply.

### FAST MATCHING

- 2-stage fast matching algorithm with patented "Entropy Point Pairing" method
- Optimal architecture for mobile embedded applications
- Hardware independent: free from hardware acceleration (ARM-NEON / GPU / DSP)
- No floating point arithmetic and all codes are fully written in C/C++

### UNRIVALLED ACCURACY

- Enhanced robustness to the variation/distortion of fingerprints by Suprema's patented technologies
- Reconstruction of discriminative fingerprint patterns from various noises
- Unique pattern analysis technique to ensure consistent performance over low-quality fingerprints (wet/dry skin, partial wound, crease)

### ROBUSTNESS OVER TIME

- Intelligent self-learning algorithm to reflect users' fingerprint condition and habit
- Highly compressive template to cover full finger area and variations
- Smart template management to enable algorithm to deal with variation and habit of user

### FLEXIBILITY IN DESIGN

- Sensor-specific pre-processing algorithm (capacitive / optical / under glass (up to 300um))
- Sensor independent features and patterns
- Satisfactory FRR even with smallest sensor size (13 mm<sup>2</sup>)
- No dependency to the sensor shapes (square/rectangle)

# The world's **fastest**, most **accurate** mobile fingerprint technology ever

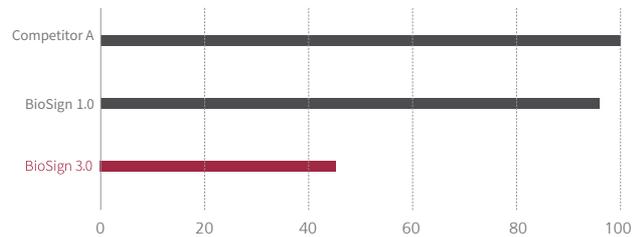
BioSign 3.0 provides unrivaled authentication performance through advanced machine learning algorithm. The ultra-fast matching speed can even be achieved with mid-to-low range smartphone processors with the highest security while ensuring the lowest false acceptance rate (FAR)

## When speed matters

Matching speed more than twice as faster as the leading competitor

\* Test environment (BioSign)  
 · Console app. via ADB interface · Platform : Samsung Galaxy S7

Average Authentication Speed (ms)

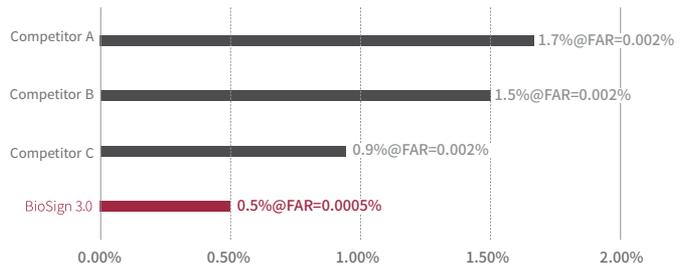


## Take the most secure solution available today

45% to 70% lower FRR than major players

\* Test environment  
 300 fingers ( 50 person x 6 fingers ) x 100 tries = 30,000 tries  
 Indoor, phone on desk, Not moving user, Normal condition fingers

False Matching Rate

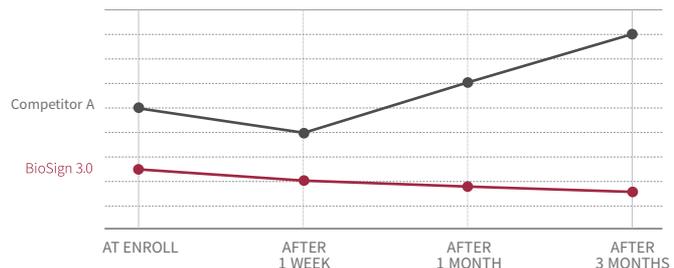


## A technology gets smarter with use.

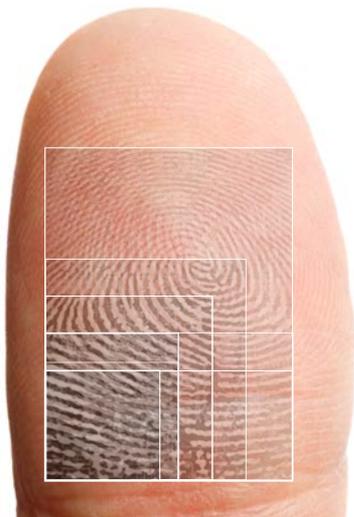
Self-learning algorithm to reflect user's changing habits and conditions

\* Test environment  
 25 fingers ( 5 users x enrolled 4 fingers ) x 10 times authentication tries every 1 week during 3 months Indoor, Phone in hand-held, Not moving, Normal condition fingers

Error rate over time (FRR)



BioSign 3.0 allows greater **design flexibility** by supporting various sensor form-factors



Wide Range of Sensor Sizes & Form-factors

- |          |  |            |          |   |            |
|----------|--|------------|----------|---|------------|
| <b>A</b> |   | 4 X 3.2 mm | <b>F</b> |  | 7 X 3.5 mm |
| <b>B</b> |   | 4 X 4 mm   | <b>G</b> |  | 8 X 4 mm   |
| <b>C</b> |   | 5 X 4 mm   | <b>H</b> |  | 8 X 8 mm   |
| <b>D</b> |   | 5 X 5 mm   | <b>I</b> |  | 9.5 X 3 mm |
| <b>E</b> |  | 6 X 6 mm   |          |   |            |

BioSign 3.0 ensures the **best performance** regardless of **sensor types** from conventional capacitive to latest under-display sensors



· Capacitive Sensor



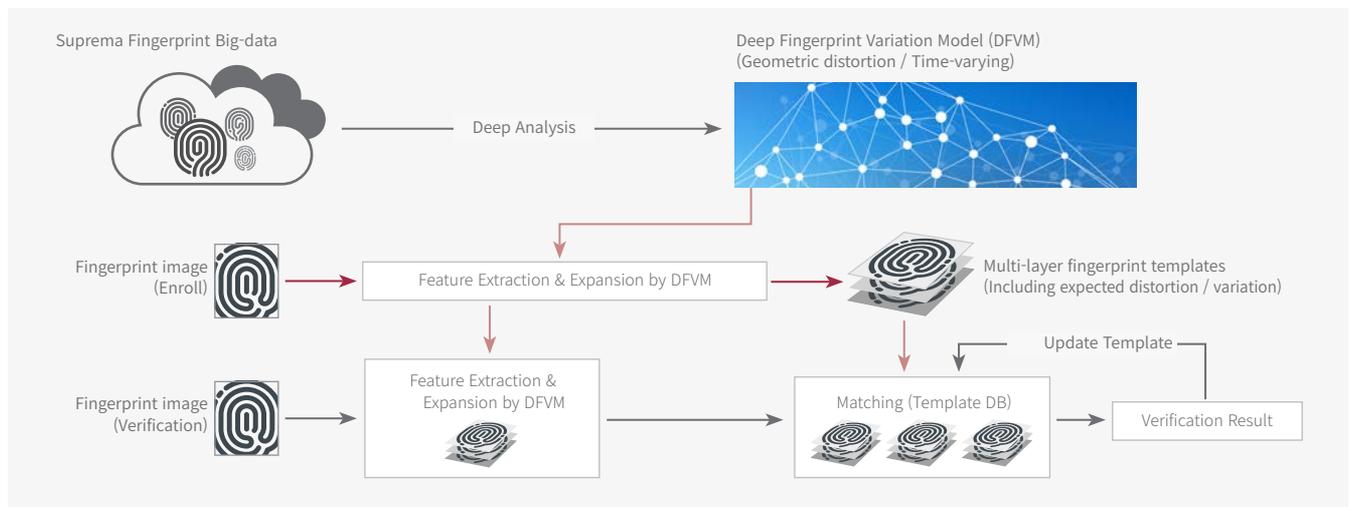
· Under-glass Sensor



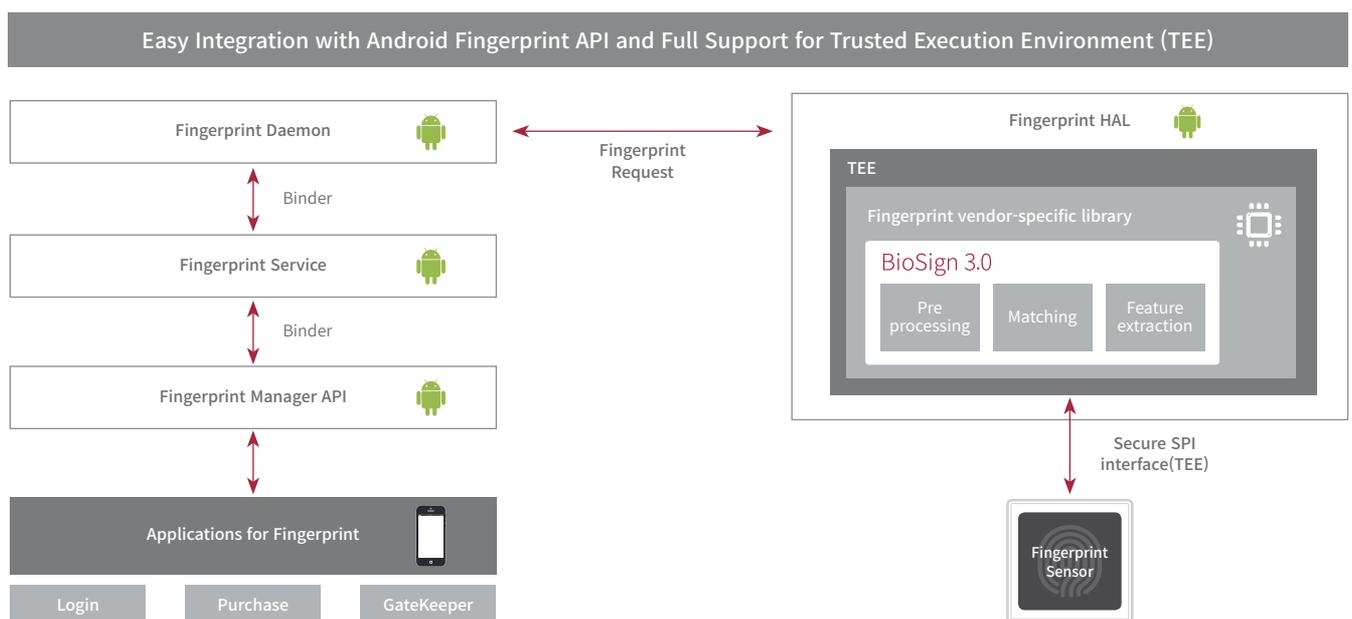
· Under Display

## In-depth **Intelligent** Fingerprint Pattern Analysis Requiring **Minimal Computing** Resources

BioSign 3.0 offers uncompromising security with the lowest error rate. Using Suprema's proprietary biometric technologies, from pre-processing, feature extraction, to matching stages, BioSign 3.0 provides the maximum level of security with minimal processor and memory usage.



## Seamless Integration Support



# 6 reasons

why customers choose Suprema as the most preferred technology partner in fingerprint biometrics.

## 1 The World's best performing fingerprint technology provider.



Matcher & Extractor Algorithms  
**Ranked No.1**  
in US Govt. NIST MINEX Test



Suprema Fingerprint Scanners Received Full Compliance and Final STQC Certification for India Government's UID Project



Suprema Algorithm  
Marked **Best** Accuracy of (Lowest False Rate) at **FVC 2010**



Suprema Fingerprint Scanners Received **Highest Image Quality** Certification from FBI IAFIS Appendix F

## 2 The World's most widely-used biometric technology.



Over **1,000,000**  
Fingerprint Devices Installed Worldwide



Over **1,000,000**  
Fingerprint Modules Sold Worldwide



Biometric Solutions  
over **1,000,000,000** People



Suprema solutions used in  
over **100** Countries

## 3 Proven market leadership with leading industry awards & recognitions.



Named to the World's TOP 50\*  
Security Company Ranking from 2010-2017  
\*Industry rankings in revenue



Detektor awards for best product an best innovation in 2009, 2010, 2012, 2017



No. 1 Biometric Vendor  
of EMEA regions in Market Share  
\*IHS Report 2015



ASIA's 200 Best  
Small Caps  
Forbes



Best Biometric Solution Award  
at ISC Brasil 2016  
\*Industry rankings in revenue

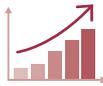


Technology Fast 500  
Asia Pacific  
Deloitte



## 4 Outstanding business growth and excellent financial stability.

  
**\$300m**  
 Market Capital  
 (Listed company in KOSDAQ)

  
**12%**  
 CAGR  
 during 2010-2015

  
**A+**  
 Excellent Financial Stability  
 (by Korea Investment Services)

## 5 Global penetration : partnering with multi-nationals and governments.

· Key Global Partners	 <b>BOSCH</b>	 <b>Honeywell</b>	 <b>HIKVISION</b>	 <b>tyco</b> Security Products
· Public ID Projects	 <b>US</b> 2010 Census	 <b>China</b> Ministry of Public Security	 <b>India</b> Unique Identification (500+Million Users)	 <b>Korea</b> National Police Agency (500+Million Database)
				 <b>Japan</b> National Police Agency


**over 10,000,000,000**  
 Fingerprints processed by Suprema solutions

## 6 End-to-end biometric technology provider.

-  Mobile Fingerprint Authentication
-  Biometric Time Attendance
-  Public Identification
-  Civil Identification

-  Fintech
-  Physical Access Control
-  Forensic Science
-  Law Enforcement



INNOVATION IN BIOMETRICS

**suprema**  
BIOMETRICS & SECURITY

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