



Introduction of MMT

Jan 2019

MICROMETRICS TECHNOLOGIES

www.mmt.com.sg

put your finger on our sensor

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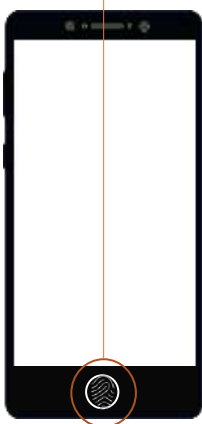
◇ The Trend of Smart Phone Panel

FINGERPRINT INTEGRATION ROADMAP



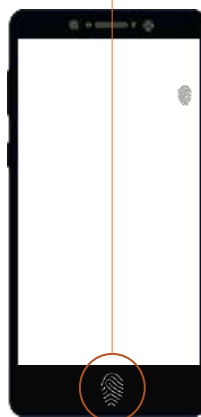
Will the value of fingerprint sensor disappear?

2013



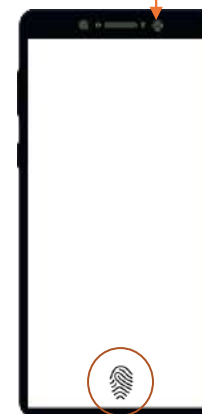
- Button
- Cover

End of
2016



- No more button
- No dedicated cover

2018

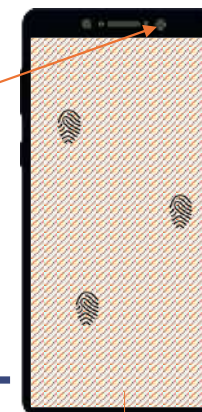


3D camera for face recognition
Or Iris recognition dedicated module
(Could be implemented in 2017 smartphone)

- Under display integration

Fingerprint sensor integration will require

2020+



- In-display integration
- Fingerprint module integrated within the display module

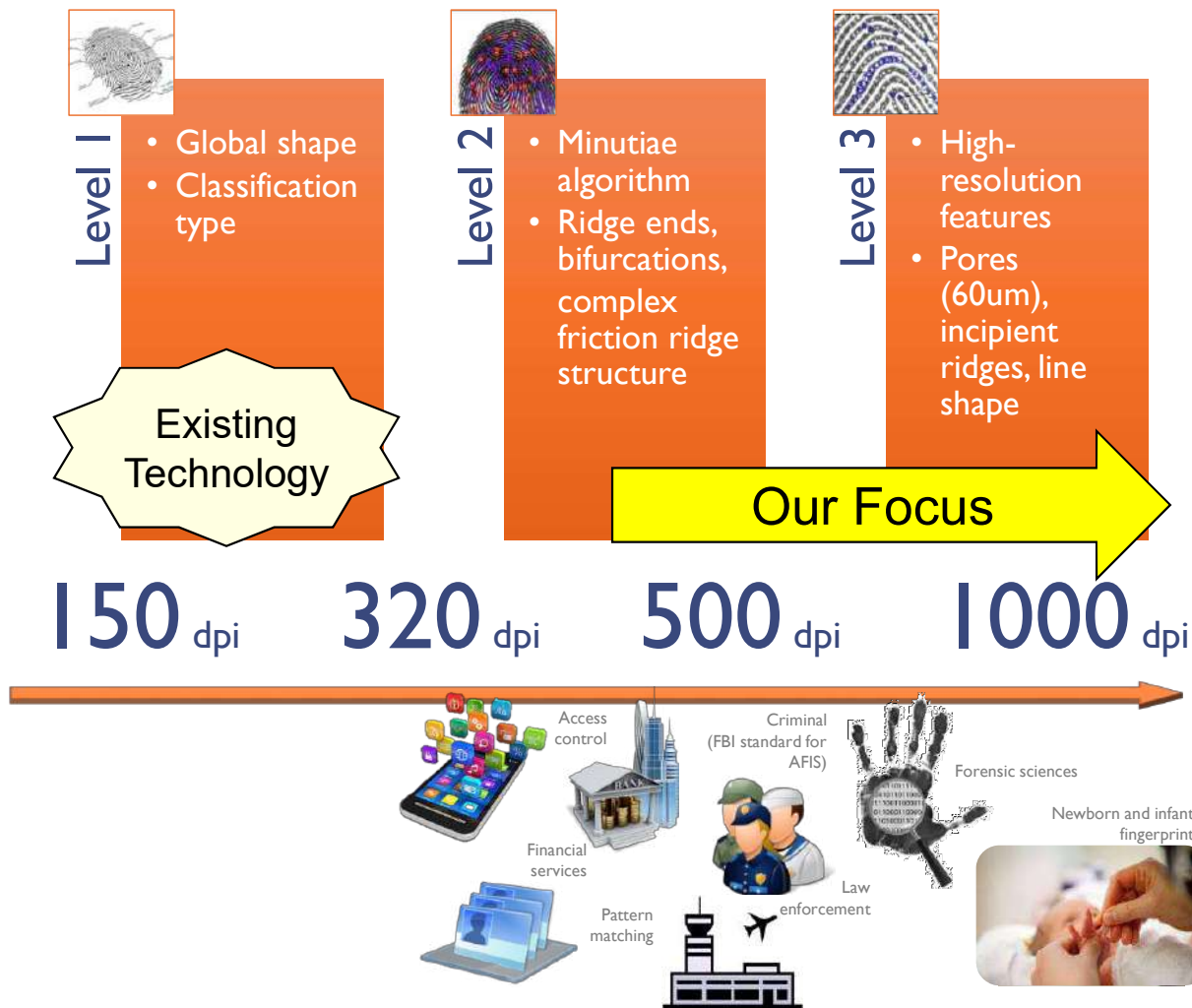
Fingerprint function could be a simple deposition process integrated within the display manufacturing process. The value of the fingerprint sensor could disappear...



◇ The Trend of Fingerprint Sensor

FINGERPRINTS - DIFFERENT LEVELS

Consumer biometrics reach 500 dpi. This allows high-level security compliance, i.e. FBI standards requiring 500 dpi resolution.



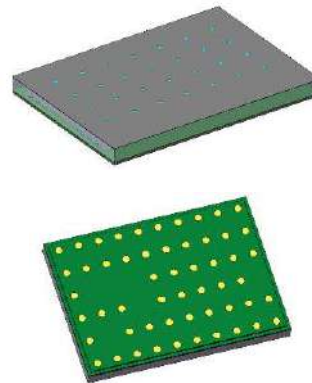
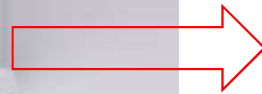
source: NEXT Biometrics

@2017 | www.yole.fr | Fingerprint Sensors



put your finger on our sensor

The World-first Chip-level Microscope



MMT successfully developed the first ever High-resolution (up to 4000dpi) chip-level microscope chipset in August 2017.

When using it to fingerprint ...

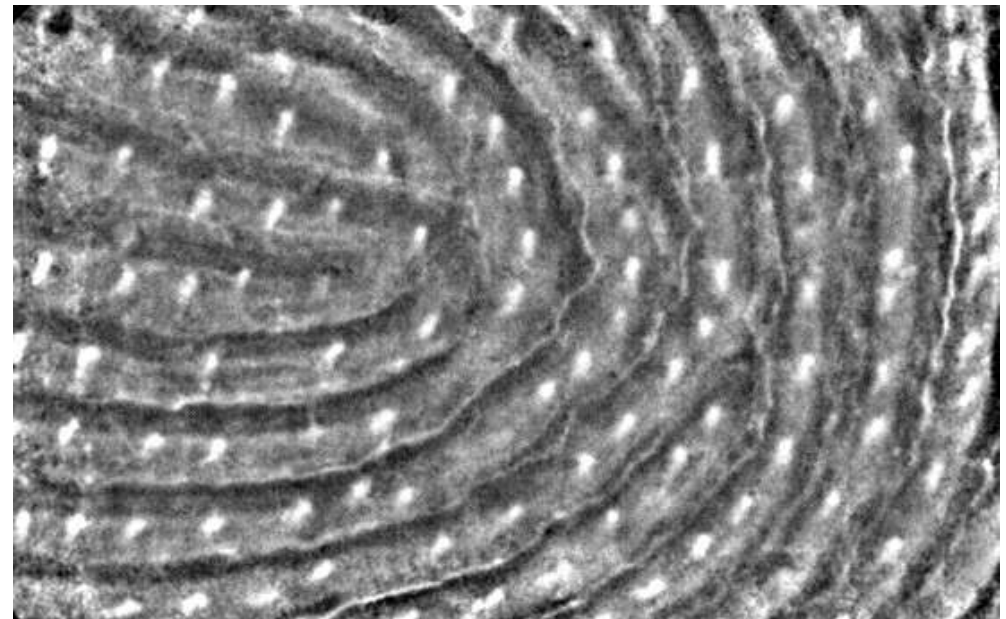


Left: Sweat pores image taken by actual microscope (x100).

Right: Image caught by MMT new sensor in same location. Amazingly consistent !



- by x100 normal microscope



- by MMT sensor

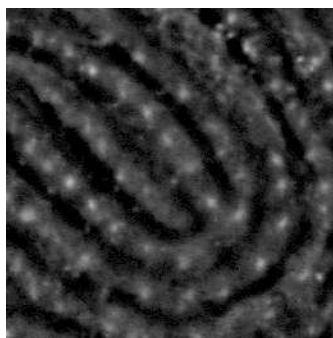


Why the Resolution make difference?

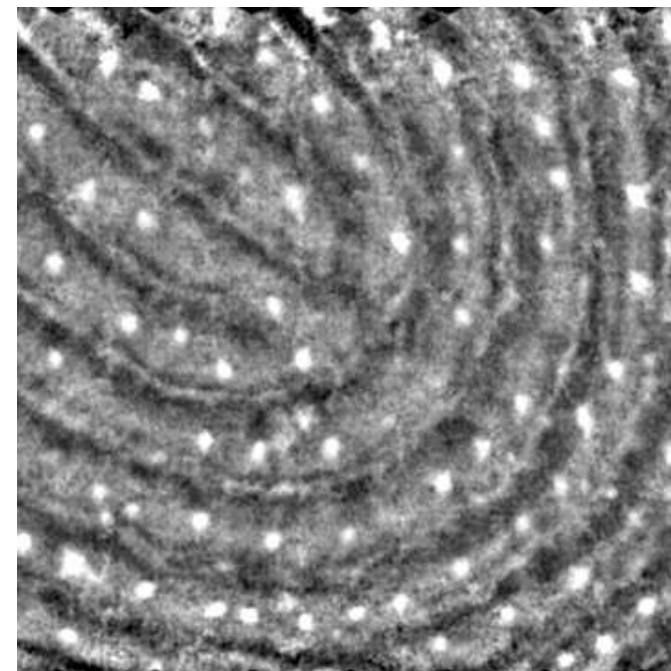
Applying different resolution sensor
in same size of area (5mm x 5mm)



508dpi
100 x 100 pixel

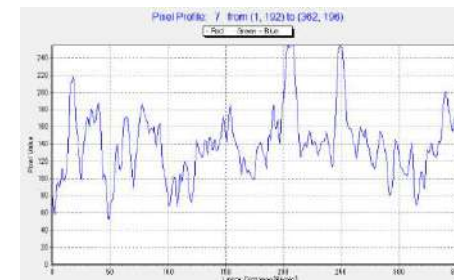
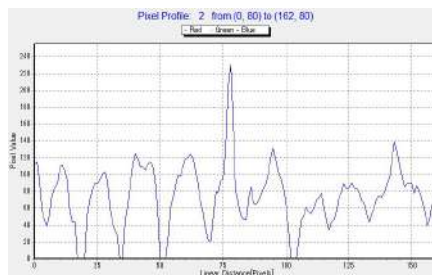
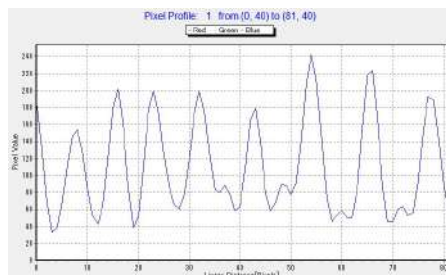


1000dpi
200 x 200 pixel



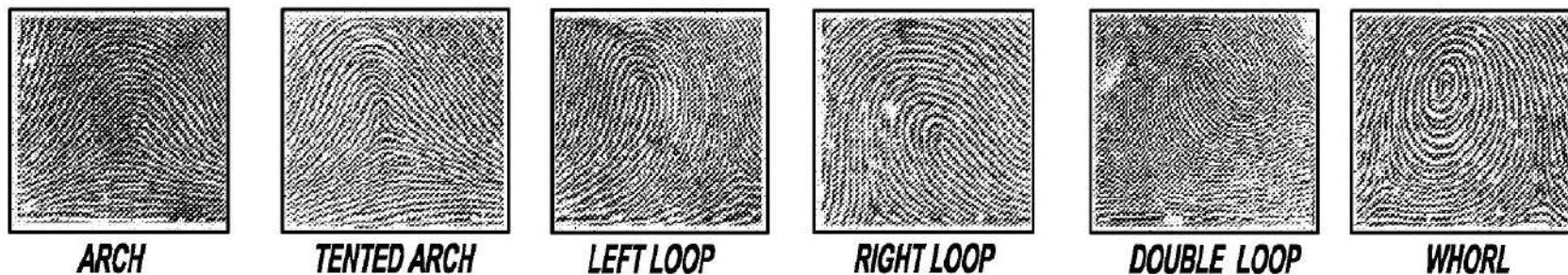
2000dpi
400 x 400 pixel

■ Difference of the data info collected

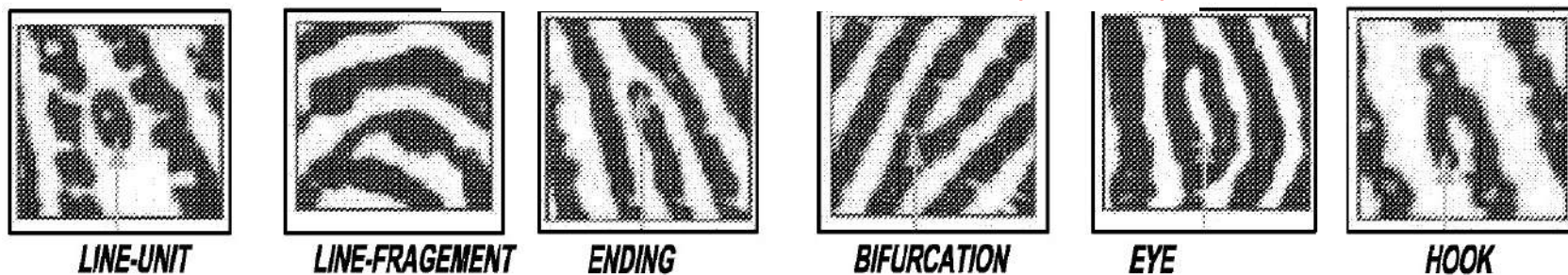




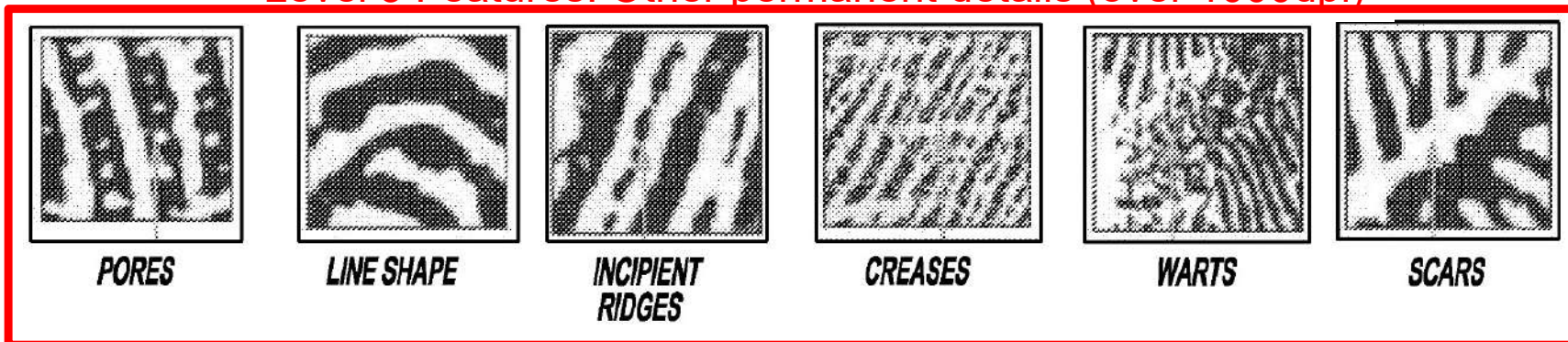
Level 1 Features: Ridge flow and Pattern type.



Level 2 Features: Minutiae (500dpi)



Level 3 Features: Other permanent details (over 1000dpi)



Level 3 features for fingerprint matching (US 20070230754 A1)
FIG-1

<https://www.google.com/patents/US20070230754>

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Other Applications in Security



- ◆ On-line transactions
- ◆ Industrial → Banking, Airport, Hospital etc.
- ◆ Government → Custom, e-government etc.
- ◆ Smart Home



◇ Our Core Technologies

- **High Resolution** (up to 4000dpi) is achievable thanks to our cutting-edge quantum optical design, and micro light-conducting system.
 - ⇒ Able to catch the highest dpi fingerprint image up to level 3
- **Higher Security** finger print solution is practical now with our excellent self-learning algorithms, highly improved in FAR/FRR .
 - ⇒ Much higher security that will eventually cover all the industries
- **Smaller** fingerprint area is good enough for authentication.
 - ⇒ Able to reduce the sensor space and product cost
 - ⇒ Even fingertip can be used for authentication



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