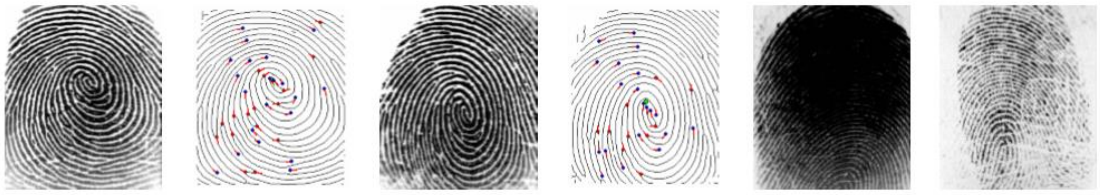
THE ADVANTAGE OF ONYX HD™ TOUCHLESS FINGERPRINT CAPTURE OVER TOUCH-BASED SENSORS

Touch-based mobile fingerprint acquisition systems use a solid flat sensor that requires contact of the finger on the sensor surface. Captured fingerprint images are easily affected by the condition of the finger surface and the manner of finger pressing. A layer of fatty acids is left on the sensor each time it is used. (When investigators collect a print from a crime scene, the residue is what is used to extract the latent print.) These fatty secretions accumulate over time causing distortion of the touch-based sensor. This often results in problems such as image deformation, durability weakening in the sensor, latent fingerprint issues which can lead to forgery and also hygienic problems. Additionally, since the image varies with each impression, each fingerprint image from the same finger can appear quite different.



(a) (b) (c) (d) (e) (f)

Fig. 1. Captured fingerprint images from a touch-based sensor are easily affected by the condition of the finger surface and the manner of finger pressing due to the sensing principle, and it can degrade authentication performance. (a) and (c) are gray-value images, (b) and (c) are corresponding minutiae extracted images, and (e) and (f) show the effects of different levels of impression.

With ONYX touchless mobile verification, these problems don't exist. As the finger doesn't contact anything, we avoid many of the issues inherent in touch-based capacitive sensors.

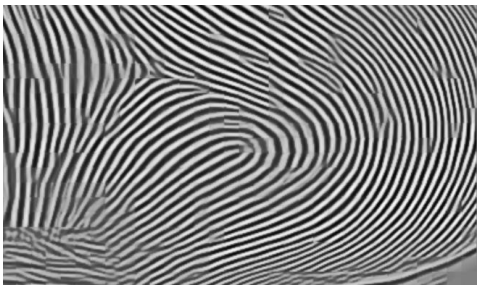


Fig. 2. Gray-value image captured using ONYX HD with a mobile phone camera. The clarity of the image is noticeably better than the touch-based sensor images in Fig. 1.

Advantages of using touchless acquisition (ONYX HD) include:

i) The fingerprint image can be acquired without plastic distortion from contact pressure.

ii) Latent fingerprints do not appear on the sensor, reducing the chance of compromised biometric data.

iii) Hygienic problems are reduced.

iv) A large image area can be captured quickly.

v) The large data capturing area of a mobile phone camera can provide much more information than the small-area touch fingerprint sensor.

vi) The technology is not susceptible to electronic discharge damage.

The combination of distortion-free fingerprint images and large image areas ONYX provides is desirable in order to acquire many minutiae in the same relative location and direction at every instance. Therefore, this combination helps the authentication system to have lower ERR (Equal Error Rate: a combination of false acceptances and false rejections.)

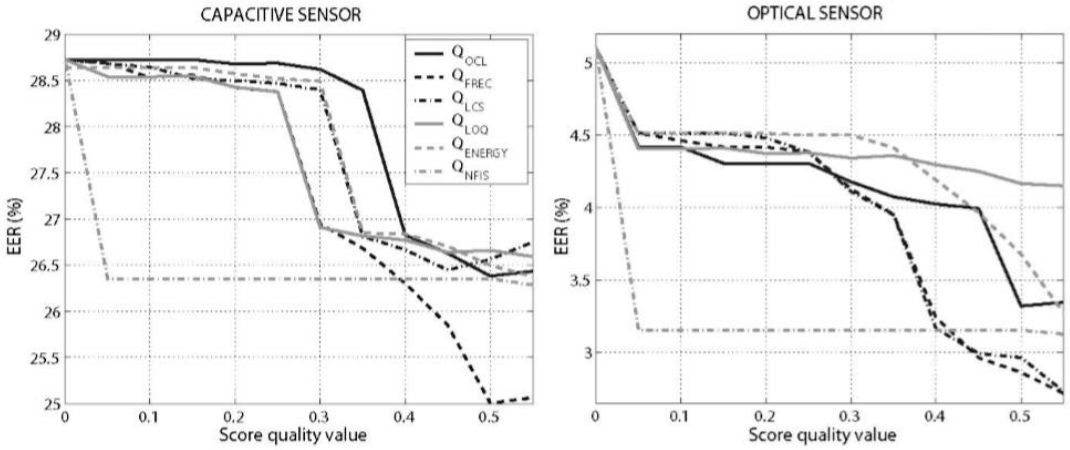


Fig. 3. Graph showing a much lower error rate for optical sensors than capacitive-touch sensors. Note the difference in ERR range for the two graphs. (Lower numbers are better.)

Given the accuracy facts listed above, ONYX achieves a higher biometric performance compared to touch-based sensors.

Sources:

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