

Comparison of Mobile Biometric Modalities

Fingerprints have been used for personal identification for centuries. The matching accuracy with fingerprints has been shown to be very high, leading to the universal acceptance of fingerprints. A fingerprint is the pattern of ridges and valleys on the surface of a fingertip, the formation of which is determined during the first seven months of fetal development. Even fingerprints of identical twins are unique as well as the prints of each finger of the same person. Multiple fingerprints of a person (as provided by ONYX Four Finger) provide additional information to allow for large-scale recognition, involving millions of identities.

While the verification performance of the commercially available face recognition systems is acceptable, they impose a number of restrictions on how the facial images are obtained, often requiring a fixed and simple background and/or special illumination. These systems have difficulty distinguishing a face from images captured from two drastically different views under different illumination conditions. It is questionable whether the face itself, without any contextual information, is a sufficient basis for recognizing a person from a large number of identities with a high level of accuracy.

	ONYX®	Touch-based Mobile Fingerprint Sensors	Facial Recognition
LIVENESS DETECTION	Integrated. AI/Machine learning driven	Easily spoofed	Typically integrated
INTRUSIVITY	Non-Intrusive, subject is not required to contact the equipment for presenting the biometric sample.	Intrusive, subject is required to touch the equipment in order to present a biometric sample.	Non-Intrusive, subject is not required to contact the equipment for presenting the biometric sample.
USER CONSENT	User consent is required.	User consent is required.	User consent is NOT required.
ACCURACY	Highly accurate	Low accuracy	Low accuracy
TEMPLATE SIZE	Small template size	Small template size	Large template size
DISTINCTIVENESS	High distinctiveness and unique characteristics. Fingerprints do not repeat, not even in twins.	High distinctiveness and unique characteristics. Fingerprints do not repeat, not even in twins.	Low distinctiveness. Facial characteristics may repeat in people, e.g. in twins.
PERMANENCE	High permanence and stability, less affected by age.	High permanence and stability, less affected by age.	Medium permanence and stability, may be affected by age.
HARDWARE REQUIREMENT	Software based, can make use of existing mobile devices using the higher-quality rear-facing camera.	Requires specific set of hardware and software.	Software based, can make use of existing mobile devices using the lower-quality front-facing camera.
CIRCUMVENTION	Low-risk	High-risk	High-risk