IARPA Nail-to-Nail Challenge Registration

All Stage 1 Registrations need to be submitted to Challenge.gov by March 17, 2017

Company Info		Technical POC	
Name:	JENETRIC GmbH	Name:	Daniel Krenzer
Address:	Moritz-von-Rohr Strasse 1A 07745 Jena Germany	Phone:	+49 3641 32199 75
		Email:	d.krenzer@jenetric.de
N2N System Description			
Title: LIVETOUCH quattro		☐ Software Solution (uses conventional sensor) X Hardware/SW Solution (custom hardware and software)	

Abstract

We have developed a new fingerprint capture technology that allows for the first time a combination between a fingerprint sensor and a display. By using a transparent fingerprint sensor, based on optical TFT, we have been able to integrate the guidance for the users of fingerprint scanners directly underneath the capture area. Therefore the user can be guided through the capture process, get instructions when, where and how to place his fingers onto the scanner. In addition, the user is supported in case of mistake in finger positioning, rolling or other typical capture errors. The scanner and the integrated user guidance works both for flat as well as for rolled fingerprints. Thus, our system is designed for self-service applications. Particularly for rolled fingerprints it allows to capture them without the need of an operator. By intelligent on-device instructions the user will intuitively know which finger he has to roll, where to place the finger, in which direction the finger should be rolled, how far and at which speed the fingers should be rolled. As the capture process is fully automated, there is not need to push any button neither for starting nor for ending the roll process. In addition the system will detect typical capture errors (shifting, lifting, sequence mix) and indicate these errors to the user for re-capture.

Concept of Operations

Once the capture process has been started, the scanners displays the location where to capture the rolled fingerprint, which finger has to be placed and the roll direction (Figure 1a). As soon as the finger is placed onto the capture area, the scanner starts the capture process automatically (Figure 1b). During the capture process two vertical lines guide the user to roll the fingerprint at continuous speed (Figure 1 c). When the complete finger is rolled, the process ends automatically (Figure 1d). During the roll process the live image of the rolled finger is shown directly above the finger. That way, there is not longer the need to watch the capture process on an external screen.

Figure 1: Guided roll process: (a) Ready to capture (b) Start roll (c) Roll (d) Rolled capture completed

System Diagram

As shown in Figure 2, the scanner consists of the TFT image sensor (made of glass), a display for illumination and user guidance underneath the sensor, a PCB and a housing made of plastics. It is powered by USB 3.0 interface. All components are custom made. There are no movable mechanical components. To run the scanner it has to be connected via a USB 3.0 cable to a PC or tablet equipped with our capturing software (see Figure 3).

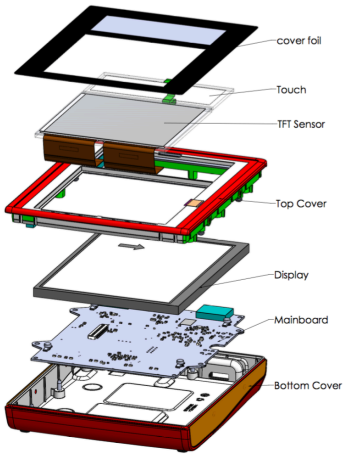

Figure 2: Scanner components

Figure 3: System setup (Scanner, USB 3.0 cable, tablet incl. software)

Anticipated Equipment

The required equipment is the fingerprint scanner (LIVETOUCH quattro) that required our TOUCHLAB SDK for operation. With an USB 3.0 cable the scanner is tethered to a PC (or tablet) for operation, power and data transfer (see Figure 3).

Devices

Creating New Device or Augmenting Existing Device.
We will use an existing device that along with the software algorithm and user guidance will be augmented for capturing rolled fingerprints.

Matchers

A) Which Matcher will your team use for the **tenprint** to **tenprint** comparison? Please select one:
__x__ Government ___ Custom ___ Not Sure

B) Which Matcher will your team use for the **latent** to **tenprint** comparison? Please select one:
__x__ Government ___ Custom ____ Not Sure

Safety Assessment

There are no components that need to be considered for safety concern. In addition, the scanner is already certified for safety (according to cURus + CB + EN).

Innovation

The system design, a transparent image sensor combined with a display and the new way of user interaction is what makes our approach unique. Not only the scanners shows directly the intuitive user guidance and instruction onto the device but also the scanner recognizes what the user is doing and reacts appropriately. This approach for the first time allows simulating the ink-and-paper capture process electronically and helps to achieve high quality rolled fingerprint images even from non-trained users in a self-service application.