IARPA Nail-to-Nail Challenge Registration

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

Company Info		Technical POC	
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N2N System Description			
Title: System for unattended nail-to-nail capture		☐ Software Solution (uses conventional sensor)	
		■ Hardware/SW Solution (custom hardware and software)	

Abstract

At a high level, what do you propose to do?

Prism based livescans have five primary attributes that prevent consistent high quality fingerprint images from being generated: dry fingers, wet fingers, halos, latent fingerprints and ambient light. From a high level, i3's goal is to demonstrate a system that manages these attributes in an unattended fashion. System aspects include improved scanner, software, and user interface capabilities.

i3 has been developing an enhancement film that lays on top of prism based devices to remove the five quality issues. Quality improvement originates from physical interaction between the film and the platen surface. Resulting data can be captured more reliably and in a more uniform manner – our prototype investigations lead us to believe that fingerprints can be reliably captured in a single attempt. In addition, fingerprint rolling software deficiencies commonly exist when creating a nail-to-nail fingerprint image. These deficiencies will be addressed. By placing these enhancements to existing approaches in an environment with video guidance, i3 hopes to create an autonomous system for collection of nail to nail fingerprint images.

Concept of Operations

How would a user interact with the device?

A monitor will provide video feedback of the steps needed to capture the fingerprint images. Using the video as a guide, the enrollee will emulate the process shown in the video to quickly capture all ten fingerprints. Scanning will be an optimized version of our existing livescan capture approach with the requirement of having the operator removed from any physical interaction with the user.

System Diagram

What are the main system components and their interrelationships/dependencies?
In particular, please address:

- *Electric/Power source (supply voltage, current) and any battery specifications (if applicable)*
- *Materials of construction – particularly for any part(s) that would contact the subject*
- *Optics/"light" information (type, wavelength, frequency, power)*
- *Original specs from any COTS parts, plus info about any modifications*
- *Description of any mechanical movements*

The system runs on a standard laptop. A livescan is connected to the laptop via a USB cable. If power is needed, one only need to plug in the laptop using a standard charging cable. The prototype fingerprint film is fabricated was made from parylene and urethane but it is likely that the production version used in this program will be made from PET. The fingerprint film is the surface that the user would touch and interact with. The light wavelength used in our device is 525 nm (green) (from an LED light source) but this is almost immaterial because from the surface of the device the user will see little to no light. The digID mini+ device will be used for scanning and its specifications can be seen at http://www.idintl.com. The only modification to the physical attributes of the scanner on the website will be the addition of a film that lays over the platen and adheres to the area around the platen. There are no mechanical movements in this proposed system.

Anticipated Equipment
What are the software packages and/or hardware components?

The software package will be an enhanced version of i3's inVize ID or FPCheck data collection software that runs on a standard laptop or desktop computer, an USB interface livescan device (digID mini+), and the fingerprint enhancement film that has been placed on top of the device. There may also be a screen/kiosk implementation that provides feedback to the system user.

Devices
Will you be constructing a new device for this challenge or will you be extending the use of an existing device for this challenge? Please select one of the following: Creating New Device or Augmenting Existing Device.

Augmenting an existing device with an image enhancement film and self-attended system feedback.

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

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

Safety Assessment
Are there any components (electrical components, illuminators, etc.) in your design which may cause safety concerns with human subjects testing?
No.

Innovation
What makes this approach unique?

The image enhancement film is completely new and innovative. It is designed to be placed on any TIR based fingerprint scanner. In combination with improvements in nail-to-nail image construction and self-attended operation, the film should offer a compelling, low cost mechanism to dramatically improve usage of nail-to-nail images.