NIST guides seek interoperability for automated fingerprint ID systems

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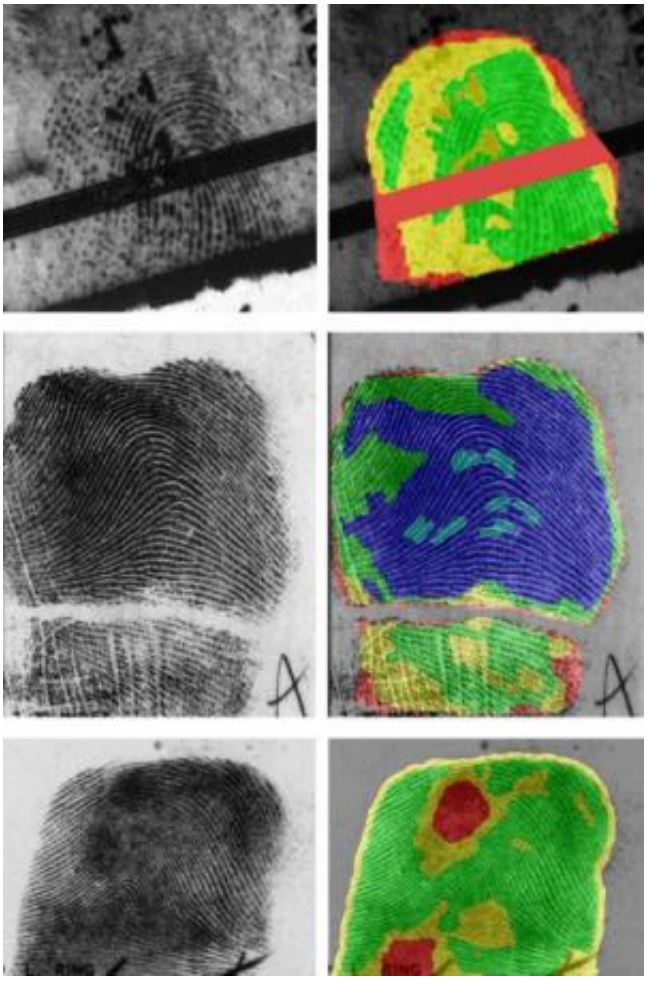

These are examples of fingerprint images (left column) on which a color-coded "quality map" has been superimposed (right column). The color coding provides forensic examiners with a means of marking the quality of the data that can obtained from the friction ridge details seen in the images. Blue areas are excellent, green are satisfactory, yellow may potentially contain false or missed features, and red have no value at all. Credit: NIST

A new set of publications from the National Institute of Standards and Technology (NIST) could make it easier, faster, and most importantly, more reliable, for forensic examiners to match a set of fingerprints with those on file in any database, whether local, state or national.

Automated fingerprint identification systems (AFIS) allow forensic examiners to match latent prints—those left at a crime scene—against known (or exemplar) prints on file. Currently, forensic examiners must encode the distinctive features of a latent print into an AFIS to make this happen. If there are different identification systems involved—such as searches against prints stored at the local, state or national levels—the notation methods and data definitions may differ from one AFIS to the next. Examiners must re-encode each print for each new search on a different AFIS. This lack of latent print search interoperability impacts the ability to rapidly and accurately make positive identifications.

To address the problem, in 2008 NIST and the Department of Justice's National Institute of Justice (NIJ) convened the Latent Print AFIS Interoperability Working Group, a body made up of experts from state, local and federal law enforcement and forensic and information technology organizations. Based on one of the Working Group's recommendations, NIST's Law Enforcement Standards Office (OLES) partnered with NOBLIS, a nonprofit research corporation headquartered in Falls Church, Va., to facilitate implementation of the Extended Feature Set (EFS), a standard method for encoding fingerprint, palmprint or footprint features known as friction ridges regardless of what AFIS is used. The latest result of this partnership is the issuance of three NIST Special Publications (SP) to help forensic examiners better understand and more effectively use the EFS, and provide organizations with guidance on procuring an interoperable AFIS. These are:

- NIST SP-1134—Extended Feature Set Profile Specification: This guide defines EFS Profiles, sets of reference friction ridge characteristics that let examiners "triage" their search strategies so that they are appropriate to the image quality and information content of the latent print being studied. The availability of different profiles gives examiners the flexibility to provide the AFIS with no detail (an "image only" search) all the way up to a complete input of every feature present. As a result, examiners can make effective trade-offs between encoding effort and resulting search accuracy.
- NIST SP-1151—Markup Instructions for Extended Friction Ridge Features: This guide provides instructions for latent print examiners to encode a very rich set of latent ridge print information using the EFS. These instructions ensure that examiners use the same terminology, references and procedures to describe friction ridge characteristics. The common definitions are necessary for AFIS interoperability and facilitate the exchange of data between examiners.
- NIST SP-1152—Latent Interoperability Transmission Specification: This guide describes the application profile language by which different AFIS can communicate with each other, define what transactions are permitted between systems, and what responses can be expected.

The EFS conforms to the ANSI/NIST-ITL 1-2011 standard* and the FBI's Electronic Biometric Transmission Specification (EBITS) .**

All three publications can be downloaded via links on the Latent Print AFIS Interoperability Working Group Web page, http://www.nist.gov/oles/afis_interoperability.cfm.

More information: *Data Format for the Interchange of Fingerprint, Facial & Other Biometric Information (ANSI/NIST-ITL 1-2011) is

published in NIST SP 500-290, available at www.nist.gov/customcf/get_pdf.cfm?pub_id=910136.

** Federal Bureau of Investigation Criminal Justice Information Services Electronic Biometric Transmission Specification (FBICJIS EBTS), is available at www.fbibiospecs.org/ebts.html.

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