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Who Are You? NIST Biometric Publication Provides Two New Ways to Tell Quickly

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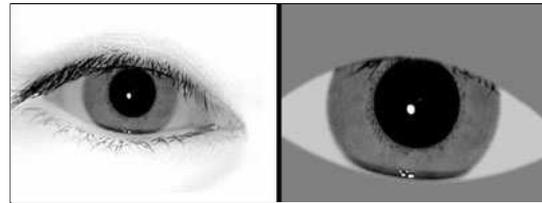
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The National Institute of Standards and Technology (NIST) has issued a new publication that broadens agency security options for Personal Identity Verification (PIV) cards. *Biometric Data Specifications for Personal Identity Verification (Special Publication 800-76-2)* adds iris images as biometric identifiers and on-card fingerprint comparison as options for the cards.

A PIV card is a government-issued smart card used by federal employees and contractors to access government facilities and computer networks. The PIV card carries a photo, fingerprint information, personal identification number (PIN) and a cryptographic credential—random computer-generated data that are recognized only by the PIV card—all of which serve to bind the card to the card holder.

To assist agencies seeking stronger security and greater operational flexibility, NIST made several modifications to the previous version of *Biometric Data Specification for Personal Identity Verification*. Major additions include:

- On-card comparison of fingerprints for improved privacy. The specifications describe how to place one or two compact fingerprint templates and a recognition algorithm on the card. When the user wants to sign a document digitally or open a secure file, for example, she can place her finger on a reader attached to the keyboard to verify her identity. Currently, employees have to type in a PIN for matching, which is subject to error and misuse.
- Iris recognition capability for increased security. Standardized compact images of one or both irises (the images are no more than 3 kilobytes each) can be loaded on the PIV card for compact on-card storage and fast reading times. The document provides performance specifications for iris biometrics to assure high accuracy and provides specifications for iris cameras to guide implementers on camera selection. These standards-based elements support interoperability within and across agencies using iris recognition technology.



These iris images meet the biometric standard. The camera image on the left is run through commercial software to produce the image (right) that can be placed on the PIV card and for other uses such as an e-passport.

Credit: NIST
[View hi-resolution image](#)

Agencies may choose to add iris images as an alternate biometric over fingerprints, because, for some users, fingerprint collection can be difficult. At times, the fingerprints are too dry to yield a good image, and lotions, wounds or illness also can make for poor images. Agencies now have the option of using two biometric sources to avoid such circumstances.

Several recent NIST research projects have led to improved technologies for identity management that are included in the updated specification.

"NIST research supports the users of these biometric technologies through its ongoing quantitative research activities," explains Biometric Testing Project Leader Patrick Grother. After applying standard compression algorithms to a large number of iris images and then using these compact images with state-of-the-art recognition algorithms, NIST researchers determined that an iris image compressed to 3KB provides enough detail to accurately recognize an individual's iris.

"This collaboration with industry and the standards community led to the ISO/IEC 19794-6 iris standard published in late 2011. The iris standard can support PIV authentication and other uses, such as e-passports," says Grother. "More importantly, the iris standard ensures that the iris data is interoperable, that is, it can be exchanged easily between cameras and readers from different makers and across the world."

In another project NIST scientists evaluated how quickly irises age. Using two data sets with hundreds of thousands of iris images collected from frequent travelers in airports, they found no significant deterioration in recognition over nearly a decade. This result guides re-enrollment schedules. Particularly, the NIST measurement suggests that irises would meet the PIV requirement that biometric data should be viable over a 12-year period.

NIST is also collaborating with the Department of Homeland Security on a camera certification process to define a repeatable optical laboratory test of a camera's peak imaging capability. This approach follows that used in developing the Federal Bureau of Investigation's "Appendix F" specification for certifying fingerprint scanners.

Biometric Data Specifications for Personal Identity Verification (NIST SP 800-76-2) can be obtained at www.nist.gov/manuscript-publication-search.cfm?pub_id=914224.

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