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Counting on Biometrics

In November 1987, 1,400 exiled Cubans burned building after building at the Atlanta Federal Penitentiary. The riot was not the spontaneous combustion of tensions among rivals, but a simmering anger sparked by a Federal Government plan to return those who had arrived from Cuba 7 years earlier in the Mariel boatlift. It was the longest prison riot in U.S. history, taking 11 days to resolve through negotiations.

Reporters were frustrated in trying to cover the siege, primarily because they were given only meager information about the more than 100 hostages. "Officials wouldn't tell us anything," one opined in a later story. But there was a reason for this lack of information: Nobody knew who the hostages were.

"We were trying to identify the people who were in the facility at the time, but it was based on a chit system where you turned in your chit and got your keys when you came to work and returned the keys when you left," says Al Turner, a former warden with the U.S. Bureau of Prisons who was sent to Atlanta to work alongside the facility's warden during the riot. "Like every other similar system, it was subject to human error and people forgetting to turn in their keys. So we had no accurate way of knowing who was inside the penitentiary when the hostages were taken. It became a difficult and time-consuming process of elimination. We called families to locate staff, put pictures on boards to try to identify potential hostages, and identified some through our negotiations with the Cubans."

Fifteen years later, a project underway at the Prince George's County Department of Corrections (DOC) in Maryland may help solve the problem of tracking staff in correctional facilities. It uses facial recognition technology for employee verification and access control.

The system employs a camera and computer to create a mathematical algorithm, or formula, of an employee's face. When each employee is enrolled in the system, this unique formula is transferred to a chip that is embedded in a proximity card the employee must carry. On arriving at or leaving work, the employee places the card in a card reader and stands in front of a camera. In seconds, the employee's picture pops up on a computer screen. Although the employee's identity can be confirmed by an attending officer, the computer scans the employee's face and compares the resulting mathematical formula to the original. It takes only a few seconds, says DOC Deputy Director Milton Crump.

The project is the result of a coalition among the National Institute of Justice (NIJ), the Defense Advanced Research Projects Agency, and the U.S. Department of Defense (DoD) Counterdrug Technology Development Program. It has been in place for a little more than a year. Those months have been spent adapting to the new system and learning the capabilities and limitations of facial recognition technology, Turner says. For example, lighting is important. The Prince George's facility set up the system in an area where natural light that shone in through side windows created shadows on the subject's face. To remedy this problem, the windows were covered with adjustable shades and track lighting was installed to put light directly on the subject.

Officials also discovered that using facial recognition technology may not be appropriate for tracking or monitoring inmates. In a field test at the Naval Consolidated Brig in Charleston, South Carolina, which houses approximately 300 inmates, the goal was to monitor prisoners' movement around the institution. Officials found, however, that the technology was not yet mature enough to scan faces under less than optimal conditions and search through a large database for a match. Turner says, "Enrolling people in a controlled situation and doing a one-to-one match is one thing. When you try to monitor people in halls or crowds, it is much more complicated."

Crump agrees, adding that other biometric technologies, such as iris scans, hand geometry, or fingerprints, may be better for large institutions or jails where inmates move constantly.

"We move about 300 to 500 people per day," Crump says. "They're coming in from booking centers or being released. Any morning we have 80 to 100 people going to court. We used to have a barcode system that was supposed to monitor inmate movement, but we literally crashed it daily. It just could not handle the high volume of movement."

Overall, the facial recognition project so far has been successful; it has been readily accepted by employees and runs relatively glitch free, with few false positives. It is easy to use and takes only seconds for verification.

The system's success has sparked plans for the future. The Prince George's County DOC will continue to test the system as long as DoD and NIJ ask, Crump says. When the project is over, it will remain in the jail. Crump adds that he and Prince George's County DOC Director Barry Stanton hope one day to connect to the State's Department of Motor Vehicles database so the DOC can log in the driver's license of every visitor and simultaneously get a current picture, verify identity, and check for warrants. The DOC would like to add an electronic fingerprint component to ensure that the facility is releasing the right person. Finally, there are plans for seamless access control, whereby a door opens or locks upon the verification, or lack of it, of an employee—a task that currently must be done manually.

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Turner, who is now an NIJ visiting scientist studying the Prince George's County project, says his plans include an evaluation of the technology's impact on institutional operations. "I'd like to know how it was accepted by the staff, if it changed the daily routine, or if, in instances where they had to account for staff, they were able to do it more quickly. We'd also like to expand it to monitor visitors and to track visitors who go from one institution to another carrying messages or contraband.

"We know that we will always need the corrections officer, but we would like to see biometrics and facial recognition technology become another tool to help them do their jobs."

For additional information about facial recognition technology, contact Al Turner, 202–616–3509, or turnera@ ojp.usdoj.gov.

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