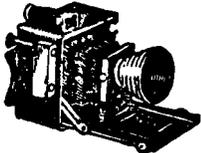




THE PRINT

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An Association for Scientific Investigation and Identification Since 1937*

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Digitized Prints Can Point Finger At Innocent

Handling, quality of image are risks

*(This article was downloaded from the January 3, 2005, issue of the Chicago Tribune at
www.chicagotribune.com.)*

By **FLYNN MCROBERTS AND STEVE MILLS**

Tribune staff reporters

CLARKSBURG, W.Va. -- Deep inside a sprawling complex tucked in the hills of this Appalachian town, a room full of supercomputers attempts to sift America's guilty from its innocent.

This is where the FBI keeps its vast database of fingerprints, allowing examiners to conduct criminal checks from computer screens in less than 30 minutes--something that previously took them weeks as they rummaged through 2,100 file cabinets stuffed with inked print cards.

But the same digital technology that has allowed the FBI to speed such checks so dramatically over the last few years has created the risk of accusing people who are innocent, the Tribune has found.

Across the country, police departments and crime labs are submitting fingerprints for comparisons and for entry into databases, using digital images that may be missing crucial details or may have been manipulated without the FBI knowing it.

Not unlike a picture from a typical digital camera, a digital fingerprint provides less complete detail than a traditional photographic image. That matters little with pictures from the family vacation. But when the digital image is of a fingerprint, the lack of precision raises the specter of false identifications in criminal cases.

"There's a risk that not only would they exclude someone incorrectly--we have the potential to identify someone incorrectly," said David Grieve, a prominent fingerprint expert who is the latent prints training coordinator for the Illinois State Police crime lab system.

An FBI-sponsored group of fingerprint examiners was concerned enough about the quality of digital images that in 2001 it recommended doubling their resolution. Three years later, though, the vast majority of police agencies still use equipment with the lower resolution.

Equally troublesome, the most commonly used image-enhancement software, Adobe Photoshop, leaves no record of some of the changes police technicians can perform as they clean up fingerprint images to make them easier to compare.

This seemingly esoteric issue is crucial because it raises questions about a bulwark of the criminal justice system: chain of custody. If authorities cannot prove that a fingerprint is an accurate representation of the original and show exactly how it was handled, its validity can be questioned.

FBI officials recognize the resolution problem but say it leads to overlooking guilty people, not falsely accusing the innocent.

“The risk that we’re hearing is that we miss people--because the resolution isn’t enough--not that we’re identifying people incorrectly,” said Jerry Pender, deputy assistant director at the FBI’s Clarksburg facility.

Potential for error rising

Such confidence is unwarranted, according to digital-imaging specialists and some leading fingerprint experts. And they say the potential for mistakes is growing inexorably as police departments around the nation switch from old inked cards to digitized computer images.

To do so, technicians scan an inked card into a computer, which converts it into a pattern of 0s and 1s that digitally represent the image, similar to how a fax machine works. And, like a fax machine, the process of digitizing the fingerprint loses considerable amounts of detail.

“It gives examiners the misleading impression that they’re getting a better-quality image to examine,” said Michael Cherry, an imaging expert who is on the evidentiary committee of the Association for Information and Image Management, a business technology trade group. “These images actually can eliminate fingerprint characteristics that might exclude a suspect.”

Measuring the number of cases in which a digital image may have wrongly linked a suspect to a crime scene is difficult. The technology is so new that many defense attorneys do not know to ask if the fingerprint image entered into evidence has been digitized.

“I think it’s a very real problem, but it’s under the [radar] still,” said Mary Defusco, director of training at the Defender Association of Philadelphia, a non-profit group that represents indigent defendants. “We have to get up to speed on it.”

One of the nation’s first successful challenges to the use of digital fingerprinting in the courtroom came in 2003 in Broward County, Fla.

The only physical evidence linking Victor Reyes to the murder of Henry Guzman was a partial palm print--an intriguing trace of evidence found on duct tape used to wrap the body in a peach-colored comforter.

A forensic analyst with the Broward County Sheriff’s Office used a software program known as MoreHits along with Adobe Photoshop to darken certain areas and lighten others--a process called “dodge and burn,” which has long been used in traditional photography.

Reyes’ attorney, Barbara Heyer, argued that such digital enhancements were inappropriate manipulations of the evidence. “It just hasn’t gotten to the point of reliability,” Heyer said.

Jurors acquitted Reyes, largely because of sloppy handling of the evidence by police. But they also were troubled by the digital fingerprinting technology used in the case. The jury foreman, Richard Morris, who writes computer-imaging software for a living, said in a recent interview that he and his fellow jurors had significant concerns about it.

No record of image changes

“The makers of the [Adobe] software dropped the ball in not providing a digital record of every action applied to the image,” Morris said. He said he would like to see lab analysts or police personnel use software that automatically would log any changes so other examiners could determine later whether the digital print had been altered inappropriately.

Ten years ago, only a handful of major police departments used digital fingerprinting. Today, more than 80 percent of the prints submitted to the FBI’s Clarksburg facility are digital.

Along with the digital technology has come inexpensive software that allows personnel at many police stations to enhance the prints at their desks. One of the most widely used digital-print software programs, MoreHits, claims about 150 clients among local, state, federal and foreign law-enforcement agencies.

The creators of these explosively popular tools also recognize the potential problems.

“It’s like a hammer. It’s not evil unless someone who is evil picks it up and uses it,” said Erik Berg, a forensic expert with the Police Department in Tacoma, Wash., who developed MoreHits.

“The risk that we’re hearing is that we miss people--because the resolution isn’t enough--not that we’re identifying people incorrectly.”

Human element crucial

Defenders of the technology contend that concerns about it are overstated because computers only spit out a list of potential matches; typically, human fingerprint examiners at the FBI's lab and at state crime labs make the final matches introduced in court.

"The benefits to law enforcement with digital fingerprints are incalculable in terms of speed of identification and exoneration of the innocent," said Joseph Bonino, former chairman of the FBI's advisory policy board for the Criminal Justice Information Services division in Clarksburg. "They provide a high degree of accuracy, assuming your human examiners are properly trained."

Trust in that safeguard took a major hit last spring when the FBI falsely linked an Oregon lawyer, Brandon Mayfield, to terrorist bombings at Madrid train stations.

When Spanish authorities connected the Madrid print to an Algerian man, the FBI had to admit it erred.

The bureau initially blamed the quality of a digital fingerprint image forwarded from the Spanish National Police. An international panel of experts later concluded that the digital image was fine; instead, the panel found, several veteran FBI examiners had missed "easily observed" details that excluded Mayfield.

Asked last month about the questions involving digital prints, the FBI issued a statement saying it would not comment further until eight teams of forensic scientists--appointed after the Mayfield case unraveled--finish "methodically inspecting every aspect of the latent fingerprint process, which includes the examination of digital images."

The sleek computer equipment inside the bureau's facility in Clarksburg cannot negate this disturbing fact: The FBI does not know if a police agency has altered any of the thousands of new fingerprint images added every day to its database, which now has 48 million sets of prints.

As long as the submissions meet FBI standards on resolution, size and information about the subject, "we wouldn't have any concerns about the quality of images coming into IAFIS," said Steve Fischer, spokesman for the Clarksburg facility, referring to the FBI's Integrated Automated Fingerprint Identification System.

Improprieties possible

But Fischer acknowledged that those standards are not a safeguard against improper manipulation of the images.

"If they were doing something out there," he said, "we wouldn't know about it."

The broader concern, though, remains the quality of the digital images themselves. An FBI-sponsored scientific working group of fingerprint experts cited concerns about the quality of digital images in 2001, when it recommended doubling their resolution, from 500 pixels per inch to 1,000.

But that is only a guideline, and most police departments haven't invested in newer equipment that would upgrade the digital images.

"The quality of the detail . . . in the [lower-resolution] digital image is not sufficient to support a lot of what fingerprint comparisons rely on," said Alan McRoberts, chairman of the working group and editor of the Journal of Forensic Identification.

The roots of using digital images for crime-solving date to the early 1970s, when San Diego police brought a palm print image to the Jet Propulsion Laboratory in Pasadena, Calif., in the hope that scientists could enhance it.

Police had found a bloody palm print on a bedsheet at a murder scene, but the weave of the sheet obscured the print's detail. The lab's scientists managed to separate the print from the bedsheet's weave using a process similar to one employed to enhance photographs taken of the moon and planets.

Since then, the drop in prices for such technology has made it widely available to law enforcement, but critics question whether all police staffers using it fully understand its limitations.

One solution to the problem is simple, according to imaging experts: Have defense attorneys ask the right questions.

Berg, the developer of the MoreHits software, outlined them: "If this is a digital image, has it been enhanced or is this the original capture with no changes to it? If it's been enhanced, I want you to show me what you did and tell me what your training is. And did you go out of your area of expertise to do this?"

If those questions aren't asked, Berg noted, a false identification might not be caught.

Find the complete Tribune series "Forensics Under the Microscope" online at chicagotribune.com/forensics.

[Editor-On the following page is a response to the article by SCAFO member George Reis. He has also sent a letter to the editor of the Tribune in response to this article.]

Comments Regarding the Article *Digitized Prints Can Point Finger At Innocent*

The recently published Chicago Tribune article “Digitized Prints Can Point Finger at Innocent” misrepresents this technology and is filled with inaccuracies, half-truths, and unsupported opinions, doing a disservice to the community as a whole and to the criminal justice system specifically.

I will pull several quotes from the article to illustrate some of the errors that were made and attempt to briefly clarify the issues.

The article states, “But the same digital technology that has allowed the FBI to speed such checks so dramatically over the last few years has created the risk of accusing people who are innocent, the Tribune has found.” This statement is unsupported, because there is no single case that can illustrate their point. Although human error led to a misidentification in the Brandon Mayfield case, this had nothing to do with digital imaging technology.

The article goes on to say, “Not unlike a picture from a typical digital camera, a digital fingerprint provides less complete detail than a traditional photographic image.” This is a half-truth, at best. Many digital images are substantially better than film, providing more detail and better information, exonerating more individuals, and leading to more correct identifications. Although some low-resolution digital cameras are used by some law enforcement agencies, digital imaging provides the ability to get better exposure and a greater tonal range on a computer monitor than is possible with prints from film-based images. And, of course, the issue never is whether an image is equal to film, but whether it contains adequate information to make an individualization.

The article continues, “But when the digital image is of a fingerprint, the lack of precision raises the specter of false identifications in criminal cases.” Again, there is not a single case in which this is true. The article does not list any cases to illustrate this because there are none. What poor-quality images can do – whether film-based, digital, or inked impressions – is prevent fingerprints from being individualized. If digital fingerprints lack the precision the article claims, the result would be fewer identifications, not false identifications.

The article then states, “Equally troublesome, the most commonly used image-enhancement software, Adobe Photoshop, leaves no record of some of the changes police technicians can perform as they clean up fingerprint images to make them easier to compare.” While it is true that some Photoshop functions are not recordable, it is irrelevant for many reasons. The automatic recording of one’s process is a convenience, not a requirement. It provides documentation that otherwise may have to be hand-written or manually typed. Valid forensic procedures are based on whether they are repeatable, verifiable, and

provide predictable results, not whether the software automatically records a specific procedure. That said, the features in Photoshop that do not automatically record are based on the use of various paint tools (including the dodging and burning tools). Using layer masks can provide superior results and provide an audit trail.

The article paraphrases “experts” as saying, “And they say the potential for mistakes is growing inexorably as police departments around the nation switch from old inked cards to digitized computer images.” No cases are listed to support this claim. The statement is strong, but the lack of supporting cases is deafening.

The article then states, “Measuring the number of cases in which a digital image may have wrongly linked a suspect to a crime scene is difficult. The technology is so new that many defense attorneys do not know to ask if the fingerprint image entered into evidence has been digitized.” In my interview with one of the authors of the article, I specifically mentioned that this technology is far from new and that early uses of digital imaging with fingerprints goes back to the 1970s. In addition, the first Kelly-Frye hearing dealing with digital image enhancement of a fingerprint dates back to 1991. There is no factual basis for the claim that this is a new technology.

A very glaring issue in the article is the statement, “One of the nation’s first successful challenges to the use of digital fingerprinting in the courtroom came in 2003 in Broward County, Fla.” The Reyes case was not a successful challenge to digital imaging, because the evidence met the court requirements. Barbara Heyer did a credible job in questioning the evidence, and the jury acquitted the defendant, but the evidence did meet the court’s requirements. A successful challenge would be a case in which the evidence was not allowed to be used in court, and this did not happen in the Reyes case.

There are additional errors, misrepresentations, and half-truths in the article. It is disturbing that The Tribune (or any news media) would print such unsupported opinion as a news feature. It is an obvious biased presentation of a technology that offers many benefits to all members of the criminal justice community – law enforcement, prosecutors, and defense attorneys.

Respectfully,

George Reis
Imaging Forensics

[Editor-I want to thank George for providing this response to the article printed by the Tribune.]

CSI America

(This article is reprinted from the November 30, 2004, issue of The Washington Times, Culture Briefs section. It was downloaded 12/1/04 from www.washingtontimes.com.)

“As confirmed addicts of the various ‘Crime Scene Investigation’ television police procedurals well know, people are constantly shedding DNA as they go through life. Microscopic amounts of skin, hair, blood, and saliva containing our individually unique DNA stick to tooth-picks, eyelashes and hat sweatbands.

“Earlier this month, voters in California passed Proposition 69, which authorized California law enforcement officials to collect DNA samples from anyone arrested for any felony crime. Before the passage of Proposition 69, collection of DNA samples in California was essentially limited to felons who had been convicted of violent crimes. Proposition 69 was opposed by a wide array of privacy advocates, including the American Civil Liberties Union, the League of Women Voters and the Libertarian Party.

“Does the new California DNA Databank violate anyone’s constitutional rights? The fact is that DNA profiles are probably not any more constitutionally suspect than fingerprints.

“[A]ny difference between fingerprinting and DNA profiles may soon be moot anyway since researchers can now extract DNA from fingerprints. For better or worse, we all now live in a ‘CSI’ world.”

-- Ronald Bailey, writing on “DNA Nation”, Nov. 22 in Reason Online at www.reason.com.

IAFIS Spawns Automatic NCIC Search From Tenprint Submission

(This article is reprinted from the Fall 2004 issue of the The Chesapeake Examiner.)

By **SANDY MCKAY**
Information Technology Management Section
CJIS

A common misconception within the law enforcement community was that ten-print submissions sent to the Federal Bureau of Investigation received a search of both the Integrated Automated Fingerprint Identification System (IAFIS) and the National Crime Information Center (NCIC).

In September 2003, a direct connection between the Interstate Identification Index (III) segment of IAFIS and the NCIC was installed and name-based searching of IAFIS ten-print submission data within NCIC became a reality. Currently all ten-print submissions sent to the Criminal Justice Information Services (CJIS) Division are searched against the IAFIS Criminal History Database and a response is generated to the ten-print contributor. Simultaneously, ten-print submission data is extracted and populated into a Ten Print Inquiry (QTP) message and sent to the NCIC. The QTP message is searched against the Wanted Person and the Violent Gang and Terrorist Organization (VGTOF) Hot Files of NCIC. The owner of the NCIC record is notified of the NCIC name-based search results via a National Law Enforcement Telecommunications System message. The owner of the NCIC record is responsible for the utilization of the ten-print information supplied in the QTP notification to further the investigation of the NCIC subject.

This interface between IAFIS and NCIC to conduct a name-based search is referred to as “Hot Check.” Hot Check has aided federal, state and local agencies in identifying the location of numerous Wanted and VGTOF subjects for apprehension and extradition.

The CJIS Division envisions future enhancements to Hot Check to potentially afford the law enforcement community with greater visibility to the information provided by the dual search of IAFIS and NCIC. This visibility would provide a boost for CJIS and the law enforcement community in their partnership to fight crime by increasing the apprehension of the criminal and terrorist elements and by elevating public safety.

SCAFO President James Dennis “De” Alexander Laid to Rest December 23, 2004

Past President James Dennis “De” Alexander, 62, a resident of Hesperia, CA, for 1 ½ years, formerly of Rialto, CA, for 36 years, passed away on December 16, 2004, in Apple Valley, CA, due to complications from diabetes. He was born in Upland, CA. He worked for the San Bernardino Police Department as an Identification Technician for 22 years. He joined SCAFO in 1983. He was Past President of SCAFO in 1990; Commander of Police Reserves in 1974; member of San Bernardino Elks; Army, 3 years in Okinawa (Chaplain’s Assistant); Assembly of God member.

He is survived by his wife, Janie Alexander, of Hesperia; daughter and son-in-law, Audra and Doug Botterell; grandson, Alexander Botterell, all of Hesperia; cousins, Chris Aho and Peggy Sies, both of Michigan.

Services were held Thursday, December 23, 2004, at the Rialto 1st Assembly of God, with Robert Breden Officiating.

Memorial Contributions may be made to American Diabetes Association.

The above was taken from Death Notices printed in *The Sun* newspaper.

“De” was a friend and co-worker of mine. I meet De when I started at the San Bernardino Police Department on January 14, 1991, as an Identification Technician. For several years, until he retired, we sat next to each other, telling each other stories and talking about our profession. He was always happy and had a positive attitude.

I joined SCAFO in 1991, and in December 1995, De swore me in as a SCAFO Director for 1996. In December 2000, I again was privileged to have De swear me in as the 2001 SCAFO President. He was always supportive of my involvement with SCAFO and other associated organizations.

Even though De will not be forgotten, I will miss our occasional phone calls and emails.

Fraternally submitted,

Bob Goss,
SCAFO President, 2001

MINUTES OF DECEMBER MEETING

DATE: December 4, 2005
LOCATION: Boathouse Restaurant, Mission Viejo
HOST: Dennis Uyeda
SECRETARY: Gina Russell-Durgin
SPEAKER: Frank Fitzpatrick, OCSA-Retired
PROGRAM: Madrid Train Bombing:
Review of the Erroneous Identification
CALL TO ORDER: Business Meeting, 2020 hours by
President Ed Palma.

ATTENDANCE:

PAST PRESIDENTS: Clark Fogg (1994), Jim Lawson (1995), Bill Leo (1996), Clint Fullen (1998), Bob Goss (2001), Steve Tillmann (2002), George Durgin (2003).

Members and guests: not reported

OLD BUSINESS:

Second Readings:

Mimi Viets

Motion to accept: Steve Tillmann
Second: Bob Goss

Swear Ins by Past President Bill Leo

Kristian Arojada, Beverly Hills Police Dept.
Rick Michelson, Grossmont College
Robert Pryor, Los Angeles Sheriff’s Dept.
Debra Schambra, Oxnard Police Dept.
Michelle Sherwood, DEA

Installation of 2005 Executive Board Members

NEW BUSINESS:

First Readings:

None

Special Award:

A plaque and gift certificate were presented to Jim and Janet Lawson for their years of service to the association.

ANNOUNCEMENTS:

February meeting TBA

ATTENDANCE DRAWING:

Not won by: Doug Peavey, Jayshree Sakaria, or Crystal Penrod. \$30.00 next month.

DOOR PRIZES:

See’s Candy gift certificates provided to all attendees.

MOTION TO ADJOURN:

Bill Leo
Second: Steve Tillmann

Meeting Adjourned: 2055 hours

President's Message

Happy New Year! The December 6 meeting at the Boathouse On The Lake was well attended by 60+ members and guests. A special thanks to Jim Lawson for the success of this meeting. We had the installation of the 2005 officers, however, a large number of board officers were absent. The speaker was Frank Fitzpatrick a member of the International Review Committee of the erroneous fingerprint conclusion of the Madrid train bombing. There was an enthusiastic discussion on the topic presented. A special thank you was presented to Mrs. Janet Lawson for her support over the years. Also a special award was presented to Jim Lawson for his dedication as treasure. Over the past years when this association needed leadership in this position, Jim stepped up and provided guidance and stability. This association owes a million thanks to Janet and Jim Lawson. Take note SCAFO is presenting Dick Warrington's Fingerprinting Technique Workshop in February, in Los Angeles and San Diego. This is a hands on workshop on how to get prints off a variety of surfaces.

On a sad note James "De" Alexander passed away over the holidays. He is a past president of SCAFO and was very involved in our profession, he will be missed. A donation will be sent to the American Diabetes Association in the name of past President James De Alexander.

The executive board meeting was held January 8 in Covina Ca. Due to the dedication and hard work of the executive board and SCAFO members, we are in sound financial health.

The 2005 schedule of meetings has been set and I look forward to seeing many of you at the meetings. Just a reminder if you make a reservation and will not attend you must cancel or you have a financial responsibility for the reservation.

Work has already started on the 2005 Training Conference set for September 30 and October 1, 2005 at Covina Ca. Now is the time to set these dates aside and make plans to attend. If you have any suggestions on speakers or topics please contact me as soon as possible. A committee has been formed for the 70th anniversary of SCAFO, which will be in two years. If you have any suggestions on the anniversary contact chairman Clint Fullen.

Fraternally yours,

Dennis Uyeda, President

Note from Dick Clason:

Hi everyone,

I wanna tell you something funny. Somehow I wound up in "Who's Who in America", 2004 issue. Among the other "honorable" things they mentioned was the notation, "Member of the Southern California Association of **Fingerpaint** Officers."

Actually, I can't fingerpaint worth a darn!

Hope things are going well at SCAFO. I miss the good times I had with all the good guys and gals. Say Howdy for me at the next meeting!

Sincerely,

Dick Clason
SCAFO President, 1978
Spokane, WA



**SCAFO
Training**

**DICK WARRINGTON'S FINGERPRINTING
TECHNIQUE WORKSHOP**
Feb. 7 & 8 - Los Angeles
Feb. 10 & 11 - San Diego
For more information visit the SCAFO website

"Every man owes a part of his time and money to the business or industry in which he is engaged. No man has a moral right to withhold his support from an organization that is striving to improve conditions within his sphere."

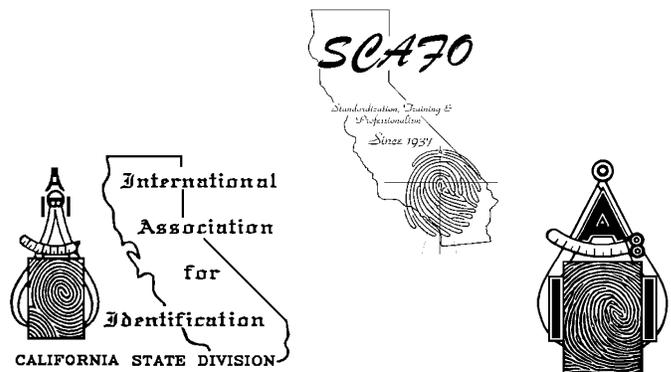
- President Theodore Roosevelt, 1908

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SCAFO Members:
Get "yourname@scafo.org".
See instructions on the
website's email page.

-- Upcoming Events/Schools/Seminars--

February 26, 2005

S.C.A.F.O. Meeting
Lisa DiMeo and Gina Russel-Durgin
CAL-DOJ

February 21 - 26, 2005

AAFS 57th Annual Meeting
New Orleans, LA

May 22 - 26, 2005

C.S.D.I.A.I.
89th Annual Educational Seminar
San Jose, CA

March 18 - 20, 2005

Standardization, Training & Professionalism
Fingerprint Society Lectures
30th Annual Conference
Brighton, Sussex, UK

August 7 - 13, 2005

Since 1937
International Association for Identification
Dallas, TX

August 21 - 26, 2005

17th Meeting of IAFS
Hong Kong, China
www.iafs2005.com

Southern California Association of Fingerprint Officers

An Association for Scientific Investigation and Identification Since 1937