

# THE IDENTIFIER

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## SCIAI SUMMER Issue

Little is known on how COVID-19 will react with summer weather conditions. However, it is hypothesized that humidity helps reduce the level of fine particles that carry the virus (maybe the only good thing about South Carolina humidity!)

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# LETTER FROM OUR PRESIDENT

So, 2020, huh?

I'm guessing I'm not the only person who's shaking their head at this year. Best meme of 2020 is the one which points out that everyone in 2015 who answered the question, "Where do you see yourself in five years," was wrong.

We are all trying to figure out what normal looks like, or what it will look like when we come out on the other side of all this craziness. Between COVID-19 and political unrest, we've all been figuring out how to continue to be diligent forensic professionals, all the while also being homeschool parents, work from home analysts, tech-savvy Zoom meeting attendees, and essential employees trying to keep up with workloads that haven't decreased much, even though folks were supposed to be isolating [?].

A silver lining to this chaotic cloud of 2020 has been the online training that I've been able to attend. A number of our favorite instructors have been offering online courses. I've been able to attend a number of classes via webinar that wouldn't have been possible in a "normal" year. In addition to these mostly reasonably priced for-a-fee webinars, if you visit the website ([www.sciai.org](http://www.sciai.org)) you'll be able to access a number of FREE online training opportunities. We hope to be able to add to those listed, as well as some product demonstrations through our favorite vendors. Visit the training page of the website and share anything else that we should know about.

We are currently working on some sort of content to present in the fall. As we are in the very early stages of planning this, we are all ears if you have any ideas!

The decision to cancel the spring 2020 Educational Conference was a tough one. Truthfully, one I didn't want to make and had hoped the governor would make so I wouldn't have to. Ultimately, he did, which allowed us to be able to change the dates of the conference without incurring any type of penalty. We have recently fixed the date of the Spring 2021 Educational Conference for April 15<sup>th</sup> and 16<sup>th</sup>. It will still be at the Columbia Metropolitan Convention Center in Columbia. While I hope to bring

back the same, or similar line up that we intended to present this past spring, we definitely have some space to adjust one way or the other, so if you have something you'd like to present, please let one of us know.

In that same vein, since we didn't have a 2020 Conference we were not able to elect new officers. All of the current officers have agreed to remain in their current positions. I am extremely grateful to each of these folks for sticking with me. During the business meeting of the spring 2021 Conference we will need to fill some vacancies: Second Vice President, Treasurer, and Secretary. Some other positions may come open. Typically, each vice-president will stand for election for the next position up (first vice president will become president, second vice president will become first vice president), but life is full of uncertainties, so it's possible we might need to fill additional offices as the election comes closer. I'd like to ask you all to consider becoming an officer for at least a term. In addition to being able to influence the types of training being presented, you'll have to opportunity to get to know forensic professionals from different agencies. This has been an invaluable resource to me throughout the years. Also, you'll be earning those precious recertification points for each year you serve as an officer. If you have any questions, please don't hesitate to contact me.

Please stay safe and stay well!





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## IN THE NEWS

### NIST Adds New 'Fingerprints' to Chemical Identification Database June 17, 2020

The National Institute of Standards and Technology (NIST) has updated its database of chemical fingerprints, called mass spectra, that are used to identify unknown chemical compounds. The NIST Mass Spectral Library and its new version, called NIST20, is used in health care, drug discovery, foods and fragrances, oil and natural gas, environmental protection, forensic science and almost every other industry that manufactures or measures physical stuff.



Credit: NIST In this 1948 photo, a NIST staff member operates an early mass spectrometer.

"If you have a mysterious substance — you have no idea what it is — you generate its fingerprints then run those prints through our library," said NIST biostatistician Tytus Mak. "If you find a match, you know what the substance is."

Those chemical fingerprints are generated using a laboratory instrument called a mass spectrometer that breaks molecules into pieces then lines those pieces up on a graph according to their mass. The resulting mass spectrum appears as a series of vertical lines that form a unique pattern for each compound.

This update includes more than 14,000 human and plant metabolites. It also included pesticides and environmental contaminants, chemicals used in manufacturing such as lubricants and surfactants, pharmaceutical drugs and illicit drugs such as new varieties of fentanyl, the drug that is driving a nationwide overdose epidemic.

<https://www.nist.gov/news-events/news/2020/06/nist-adds-new-fingerprints-chemical-identification-database>

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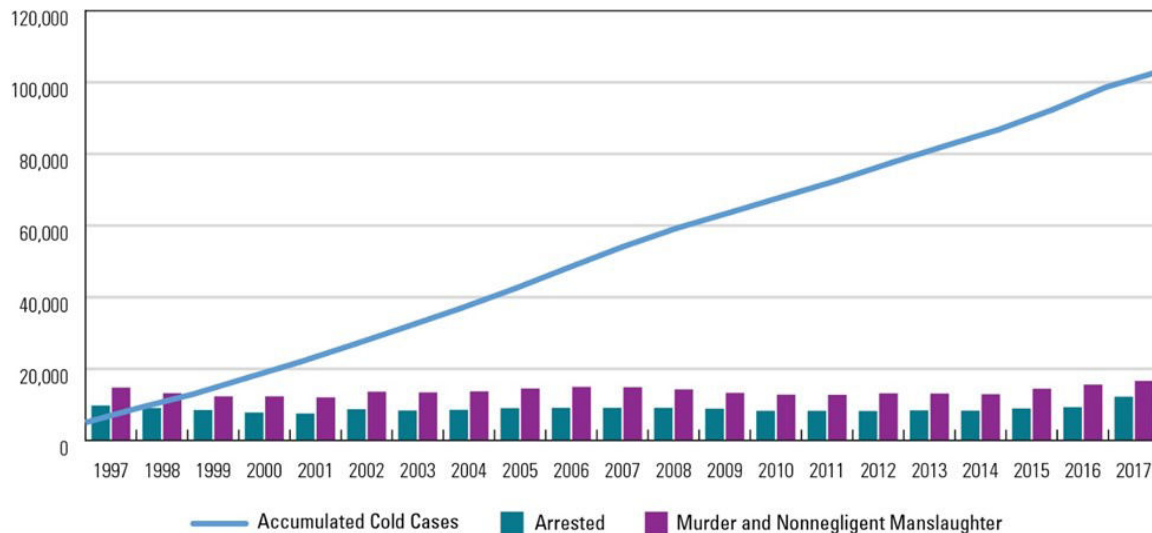
## IN THE NEWS

### Serial Killer Connections Through Cold Cases by Eric Martin, Dawn Schwarting & Ruby Chase

June 15, 2020 By: Eric Martin, Dawn Elizabeth Schwarting, & Ruby J Chase

Cold case investigations have revealed that, in many cases, the offenders are responsible for multiple crimes. Therefore, prioritizing cold case investigations can assist in both resolving crimes and preventing future ones.

In 2017 only about 60% of homicide cases were resolved. An estimated 250,000 unresolved homicides exist in the United States, and more than 100,000 have accumulated in the past 20 years alone (see exhibit 1).



(Continued on page 6)

### Video Games Designed To Address Sexual Assault on Campus June 29, 2020

A team of researchers at the University of New Hampshire developed video games to try to sensitize college students to the problem of sexual assault on campus and elevate their willingness to intervene appropriately when they observe an actual or potential sexual assault. The research team measured the impact of playing the games on male and female student volunteers' views of sexual violence and their willingness and perceived ability to intervene as a bystander. Those tests and surveys measured participants' "bystander attitude" — willingness to intervene as a bystander in a witnessed sexual assault scenario — and "bystander efficacy" — confidence in their ability to intervene in such a scenario. The research was designed to address and reduce sexual assault, the most common violent crime on college campuses. The researchers noted that online tools and video games had proven effective in advancing health intervention and education goals, and saw a need and an opportunity to apply them to sexual violence prevention, an area where few digital strategies had been applied.

In conclusion, the goal of this research was to make a game that was both educational and fun for college students. The findings did identify some benefits over time in terms of bystander attitude and efficacy, limited by game condition and gender. The researchers concluded from their preliminary results that video games have the potential to deliver information about sexual violence to students and to increase their knowledge about ways to intervene. They further concluded that video games may be one component of a comprehensive prevention plan for combating sexual assault on campus.

About This Article: The research described in this article was funded by NIJ award 2014-VA-CX-0012, awarded to the University of New Hampshire. This article relates to information in the grantee Final Report on the project, "Adaptation and Evaluation of Video Games to Reduce Sexual Violence on Campus," Sharyn J. Potter, principal investigator. <https://nij.ojp.gov/topics/articles/video-games-designed-address-sexual-assault-campus>

## IN THE NEWS

### **Serial Killer Connections Through Cold Cases** *(continued from page 5)*

Limited resources is a main cause of the crisis. Law enforcement agencies are stretched thin and often lack the personnel to adequately work cases as they happen. Cold cases are also difficult investigations because of a lack of evidence. Another likely contributor to the country's current cold case crisis is the number of serial killers operating in the United States. Estimates vary, but one estimate of the number of serial killers in the United States who have never been prosecuted for their crimes was as high as 2,000. Another study suggests that up to 15% of homicides are the result of serial killers. Meanwhile, estimates of the number of victims of serial killers, from a research study out of Indiana University-Purdue University Indianapolis, range from fewer than 200 to almost 2,000 each year.

#### **Helping Resolve Cold Cases**

NIJ has a long history of supporting the scientific, technical, and capacity needs of the forensic community, particularly as the demand for forensic testing has grown. NIJ recognizes the value of analyzing evidence from older, unresolved cases. From 2005 to 2014, the Institute provided funding for law enforcement agencies to review cold cases and submit their evidence for DNA analyses through its Solving Cold Cases with DNA program. This resulted in the resolution of more than 2,000 cold cases.

#### **NIJ's Role in High-Profile Investigations**

Through these NIJ programs, several serial killers (13) and their victims have been identified. Below are a few examples of high-profile serial killer cases that were solved with the assistance of NIJ programs.

#### **Boston Strangler**

Albert DeSalvo admitted to killing women in the Boston area between 1962 and 1964. Several of the victims were strangled, thus earning DeSalvo the moniker the "Boston Strangler." DeSalvo – sentenced to life in prison in 1967 – was killed in prison in 1973.

#### **Killer Clown**

In 1978, 30 bodies were recovered at the Chicago home of John Wayne Gacy, a part-time clown entertainer. As of 2011, 14 victims remained unidentified, but two of those victims have since been identified using forensic technologies. Facial reconstructions performed on the unidentified victims and DNA profiles obtained through NIJ's Using DNA to Identify the Missing program led to the identification of William Bundy in 2011. In 2017, NamUs assisted in identifying Jimmy Haakenson.

#### **Green River Killer**

During the 1980s, Gary Ridgway killed numerous women along the Green River in Washington state. In 2003, Ridgway – called the "Green River Killer" – was convicted of killing 49 women; he is suspected in as many as 90 homicides. In 2001, the King County Sheriff's Office used DNA laboratory equipment purchased with NIJ funds from the Crime Laboratory Improvement Program to link evidence found on four of the victims to Ridgway. In addition to not knowing the actual number of Ridgway's victims, the identities of some victims remain unknown. In 2012, through two separate awards from NIJ's Using DNA to Identify the Missing program, Bode Cellmark Forensics and the University of North Texas Health Science Center used reference DNA provided by siblings to confirm that the victim once known as "Jane Doe B16" was Sandra Major.

*(Continued on page 7)*

## IN THE NEWS

### Serial Killer Connections Through Cold Cases *(continued from page 6)*

#### Long Island Killer

In the 1990s, 11 sets of human remains were recovered along a beach in Long Island, New York. Several of the victims were dismembered and only partially recovered. Through NIJ's Using DNA to Identify the Missing program, New York City's Office of Chief Medical Examiner helped determine the identities of six victims. It also matched two sets of remains recovered from separate locations to one victim, who remains unidentified.

The medical examiner's office also obtained a partial familial DNA match between DNA samples collected from two of the victims and the brother of John Bittrolff. Bittrolff was confirmed as an exact match to the DNA from the victims and was subsequently convicted. His case was the first homicide conviction in New York based on a partial DNA match — although it still remains unclear whether Bittrolff is the "Long Island Killer" or only one of perhaps multiple killers who disposed of their victims in that area.

#### Grim Sleeper

A single source of DNA connected several homicide victims from the 1980s and 2000s, but no suspect was identified in the FBI's Combined DNA Index System (CODIS). The lag between the associated killings led to the moniker the "Grim Sleeper."

NIJ's Solving Cold Cases with DNA program enabled detectives to review and analyze DNA evidence in several of the unsolved homicides. A familial DNA search in CODIS led investigators to the son of Lonnie David Franklin Jr. NIJ funding assisted in analyzing DNA from Franklin, which was confirmed as a match to DNA recovered from the murders. In 2016, Franklin was convicted of killing 10 women, and he is suspected of killing an additional 25 women. More than 100 photographs of unknown women were found among Franklin's possessions, leading to speculation that he may have been responsible for many more killings.

#### Golden State Killer/East Area Rapist

In the 1970s and 1980s, at least two separate serial offenders were thought to be operating in California: the "Golden State Killer" and the "East Area Rapist." These unknown offenders were also known as the "Original Night Stalker," the "Visalia Ransacker," the "East Bay Rapist," and the "Diamond Knot Killer."

Funding through NIJ's Solving Cold Cases with DNA program helped link a double homicide in Ventura to a common suspect in 10 homicides and three sexual assaults throughout California — including in Orange County, where a separate NIJ award allowed investigators to work on unsolved sexual assaults and homicides attributed to the Golden State Killer and the East Area Rapist. Once investigators from multiple counties realized that the separate offenders were in fact the same person, they calculated that the suspect had possibly committed more than 50 sexual assaults. Armed with the case-to-case connections, investigators tried a new DNA investigative approach: forensic genetic genealogy, which is the identification of suspects through DNA matches to family members. In 2018, Joseph James DeAngelo was identified as a suspect, and a confirmatory DNA match led to 13 rape charges and 13 murder charges against him.

Auditing cold cases may help to clear them. With the advances in research and technology, serial killers can be identified and solved.

<https://nij.ojp.gov/topics/articles/serial-killer-connections-through-cold-cases>

## In the NEWS

### Two New Forensic DNA Standards Added to the OSAC Registry *released May 12, 2020*

OSAC has placed two new standards covering the interpretation of DNA evidence on its registry of approved standards. This signifies that these standards are technically sound and will help forensic laboratories improve their processes and methods. This effort began in 2015 and were initially drafted by OSAC, then further developed and published by the Academy Standards Board (ASB) of the American Academy of Forensic Sciences, and finally reviewed by OSAC for placement on the registry. The new standards are:

- ANSI/ASB Standard 020, Standard for Validation Studies of DNA Mixtures, and Development and Verification of a Laboratory's Mixture Interpretation Protocol.
- ANSI/ASB Standard 040, Standard for Forensic DNA Interpretation and Comparison Protocols.

Before laboratories can use a method to analyze crime scene evidence, they must perform validation studies and use the results of those studies to develop a protocol. These new standards include detailed requirements for conducting validation studies, developing protocols from them and verifying that those protocols work correctly.

In addition, the new standards are the first to focus on DNA mixtures, which occur when evidence contains DNA from multiple individuals. DNA mixtures can be more difficult to interpret than evidence that contains DNA from only one individual. Past studies have shown that different labs, or different analysts within a lab, sometimes produce different conclusions when evaluating the same DNA mixture. The new standards are aimed in part at helping labs achieve consistent and reproducible conclusions.

Two aspects of the new standards in particular will help with this. First, the verification step must demonstrate that a laboratory's protocols produce consistent and reliable conclusions with DNA samples different from the ones used in the initial validation studies. Second, the new standards require that labs not interpret DNA mixtures that go beyond what they have validated and verified. For example, if a lab has tested its protocol for up to three-person DNA mixtures, it should not interpret casework that contains DNA from four or more people. <https://www.nist.gov/news-events/news/2020/05/two-new-forensic-dna-standards-added-osac-registry>

### Face Coverings Made from Layered Cotton Fabric Likely Slow the Spread of COVID-19 Better Than Synthetics, New Study Finds *June 29, 2020 NIST C.D.*

Zangmeister, J. G. Radney, E.P. Vicenzi and J.L. Weaver. Filtration Efficiencies of Nanoscale Aerosol by Cloth Mask Materials Used to Slow the Spread of SARS CoV-2. ACS Nano. June 25, 2020.

Researchers have completed a new study of how well a variety of natural and synthetic fabrics filter particles of a similar size to the virus that causes COVID-19. Of the 32 cloth materials tested, three of the five most effective at blocking particles were 100% cotton and had a visible raised fiber or nap, such as found on flannels. Four of the five lowest performers were synthetic materials. The testing also showed that multiple fabric layers could improve cotton's effectiveness even further. None of the materials came close to the efficiency of N95 masks. Although the sample size was relatively small, the researchers noticed that tighter woven fabrics generally filtered better than knits and loosely woven fabrics. The 100% cotton fabrics with many raised fibers also appeared to filter better than cotton fabrics that lacked this feature. The raised fibers often form web-like structures similar to those in medical grade masks.

<https://www.nist.gov/news-events/news/2020/06/face-coverings-made-layered-cotton-fabric-likely-slow-spread-covid-19>



## BACK TO THE BASICS

This issue of Back to the Basics will delve into the history of fingerprints. All information is taken from *Scientific Principles of Friction Ridge Analysis & Applying Daubert to Latent Fingerprint Identification* Written & Compiled By: Thomas J. Ferriola

Many people do not realize how long fingerprints have been used as a means of identification. “Friction ridge skin impressions were used as proof of a person’s identity in China perhaps as early as 300 B.C., in Japan as early as A.D. 702, and in the United States since 1902.” (pg 1-7). “The Chinese were the first culture known to have used friction ridge impressions as a means of identification. The earliest example comes from a Chinese document entitled “The Volume of Crime Scene Investigation – Burglary” from the Qin Dynasty (221 to 206 B.C.). The document contains a description of how handprints were used as a type of evidence.” (pg1-8). Additionally, in India, there are references of nobility using friction ridge skin as signatures. However, it is believed that the use of fingerprints on documents was adopted by the Chinese. (pg 1-9). In 1684, European scientist Dr. Nehemiah Grew, described friction ridge skin in detail. Subsequently, in 1687, Italian physiologist Marcello Malpighi was said to be the first to use the microscope to analyze friction ridge skin and stated that friction ridge skin creates traction for walking and grasping. (pg 1-9, 1-10).



Photograph from <https://www.ancientpages.com/2016/03/04/fascinating-ancient-history-of-fingerprints/>

## In the NEWS

### Fingerprints, ID Marks Could Be Alternatives to Handwritten Signatures Says DeAngelo

By TAPINTO HAMILTON/ROBBINSVILLE STAFF  
July 8, 2020

**TRENTON, NJ --** Assemblyman Wayne DeAngelo (D-Mercer, Middlesex) is working to help elderly and physically challenged individuals who are unable to write with secure alternatives to a handwritten signature.

"Allowing fingerprints and identifying marks to be used as legal signatures will remove this stigma and provide those who are unable to write with safe, secure options for signing checks, voting records and other important documents," said DeAngelo of his legislative proposal that was approved unanimously Monday by the New Jersey General Assembly.

These marks could also be used as a written signature for voting purposes.

<https://www.tapinto.net/towns/hamilton-slash-robbinsville/sections/government/articles/fingerprints-id-marks-could-be-alternatives-to-handwritten-signatures-says-deangelo>

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### Global Fingerprint Sensors Market: Growth Opportunities and Competition Assessment 2020-2024 DUBLIN, July 6, 2020 /PRNewswire/

The global fingerprint sensor market is expected to grow with a CAGR of 15% from 2019 to 2024.

The fingerprint sensor market looks promising with opportunities in the consumer electronics, government and law enforcement, military, defense, and aerospace, travel and immigration, banking and finance, commercial, healthcare, and smart home industries. The major drivers for this market are the proliferation of fingerprint sensors in smartphones and other consumer electronics, government support for the adoption of fingerprint sensors, digitization in the time and attendance capturing, and use of biometrics in mobile commerce.

The study includes the fingerprint sensor market size and forecast for the fingerprint sensor market through 2024, segmented by sensor type, technology, end use industry and the region.

Some of the fingerprint sensor companies profiled in this report include Apple, Synaptics, Fingerprint Cards, Goodix, Egis Technology, Idemia, Next Biometrics, Anviz, IDEX ASA, Gemalto, and others.

<https://www.prnewswire.com/news-releases/global-fingerprint-sensors-market-growth-opportunities-and-competition-assessment-2020-2024-301088397.html>



# BACK TO THE BASICS

## Match 'Em Up!

- |                        |   |
|------------------------|---|
| A. Artifact            | 1. Friction ridge dimensional attributes, such as width, edge shapes, and pores   |
| B. Analysis            | 2. A single section of ridge containing one pore  |
| C. Bridge              | 3. Any distortion or alteration not in the original friction ridge impression, produced by an external agent or action. |
| D. Level 3 detail      | 4. A connecting friction ridge between, and generally at right angles to, parallel running friction ridges.             |
| E. Conflict            | 5. The first step of the ACE-V method. The assessment of an impression to determine the suitability for comparison.     |
| F. Friction ridge unit | 6. A difference of determinations or conclusions that become apparent during, or at the end of, an examination.         |

## True or False

- |        |  |
|--------|--|
| T or F | 1. Chinese are the first culture known to use friction ridge impressions as a means of identification. |
| T or F | 2. Friction ridge skin was first described in detail by Nehemiah Grew.                                 |
| T or F | 3. The Marcello Malpighi is credited with being the first to use microscope to study the skin.         |
| T or F | 4. India used fingerprints for authenticity on all documents.  |

# Answer Key

- A. 3
- B. 5
- C. 4
- D. 1
- E. 6
- F. 2

## True and False

- 1. True
- 2. True
- 3. True
- 4. False; India used prints on important documents reserved for royalty.



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