Trace evidence databases for forensic investigators now available online

November 8 2016

Credit: cottonbro studio from Pexels

A window is broken. A home is burglarized. Investigators identify a suspect and find a sliver of what appears to be glass embedded in his shoe. In the forensics lab, examiners determine, using advanced

microscopy and chemical analysis, that the characteristics of that sliver match those of the broken glass in the burgled home.

Pretty strong evidence, right?

Not so fast, says Shannan Williams, who manages the trace evidence research program at the National Institute of Standards and Technology (NIST). "If those characteristics are common, that sliver of glass might match half the windows in town. But if they're rare, the evidence can be extremely powerful."

That's why one of the most important tools available to trace evidence examiners is not a microscope or a chemical reagent, but a database. Besides glass, trace evidence includes hair and fibers, fire debris, metal, paint, adhesives, and explosives, to name just a few. Large databases that describe these materials—and the variability among them—make individual pieces of trace evidence far more powerful than they would be alone.

Unfortunately, much data on trace evidence is scattered in databases at forensic labs and research departments where they are unavailable to the wider forensic community. But Williams and many others are working to change that.

Many of those individuals attended a workshop at NIST on July 19-20, 2016, where experts discussed trace evidence databases and the steps needed to make them more useful and widely available.

During his presentation, Claude Roux of the Centre for Forensic Science at the University of Technology in Sydney, Australia, said that trace evidence faces an uncertain future as an investigative tool, in part because, unlike DNA evidence, it does not have the power to directly identify suspects. Roux argued that this emphasis on identification can

lead people to undervalue trace evidence, which can be used to generate leads, eliminate suspects, reconstruct sequences of events, and identify links in serial crimes.

Sandra Koch, who sits on the Materials Subcommittee of the Organization of Scientific Area Committees for Forensic Science, presented findings that also pointed to an uncertain future for trace evidence. Koch surveyed trace evidence lab managers, with many reporting that trace evidence is often perceived as a "junk science" with little or no value. An increasing number also face shrinking budgets.

In the face of these uncertainties, workshop participants discussed ways to increase the power of trace evidence through expanded access to trace evidence databases. In addition, experts from NIST, the Federal Bureau of Investigation, and the National Institute of Justice gave presentations on databases that their agencies make available to the forensic science community.

Workshop participants also discussed ways to make other trace evidence databases and collections—many compiled by individual forensic laboratories during years of casework, others created by manufacturing companies—more widely accessible to the forensic community.

Williams hopes that these efforts will help ensure that trace evidence remains a vital tool for crime fighters. "Trace evidence databases are force multipliers," Williams said. "They make every lab that uses them more effective."

Information about the Trace Evidence Workshop, including video and downloadable presentations, can be found here.

Stay tuned for other outputs from the conference, which over the next several months will include a roadmap for prioritizing data expansion

efforts for specific trace evidence types, and a "database of databases" that will list over 500 publicly available, online databases relevant to forensic investigations.

Provided by National Institute of Standards and Technology