E38 Moving Towards Using Statistics for Fingerprint Evidence in the Courtroom

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The goal of this presentation is to inform the audience of the current state and views of fingerprint evidence, share concerns within the communities regarding statistics and fingerprint evidence, inform the audience of current research initiatives and share available data, and elicit feedback and comments from the jurisprudence community regarding their views on fingerprint statistics in the courtroom.

The presentation will impact the forensic science community because in the past the jurisprudence community has not heard about current research and statistical tools for fingerprint evidence, and the practitioner community has not heard from judges and attorneys how to use these tools, or even if they want these tools introduced into the courtroom.

Since the early 1900s it has been suggested that fingerprint evidence could be presented probabilistically to express the uncertainty associated with the inference of a source attribution to a questioned impression. However, this approach never gained widespread acceptance from the practitioner community. In fact, the forensic fingerprint community has generally eschewed, even banned, the use of probabilities to express fingerprint evidence, asserting that the inherent biological uniqueness of friction ridge skin prevented duplication of ridge arrangements. Any use of probabilities would thus allow for "some probability" of duplication. Practitioners have also noted that proposed theoretical models did not correctly or completely capture expert processes, and thus use of such statistical tools was limited or inaccurate.

Recent advances in technology, computing power, and fingerprint database development have begun to make these arguments obsolete. Furthermore, the National Academy of Sciences (NAS) Report clearly supports a move towards the use of probabilities to express fingerprint evidence, not completely unlike DNA evidence. The NAS Report recommends basic understanding and knowledge in probabilities and statistics for all forensic scientists.

The first half of this presentation will discuss changing attitudes amongst practicing fingerprint experts towards a probabilistic approach and the use of likelihood ratios (LRs) to express fingerprint evidence. Attention will be paid to recent papers, research, and discourse on the topic. In the second half of the paper, some examples will be provided of how transition towards a new approach to traditional evidence can be accomplished. Obstacles, counterviews, and lessons learned will also be presented. Finally, some data from recent experiments and forthcoming publications will be shared with the audience.

At the end of the presentation, attendees may provide comments of the legal community on this matter. There has been much debate amongst the legal scholars, the practitioners, and academics. The presenters have yet to really hear from what their clients (the courts) truly want and need. There remains uncertainty on how attorneys will deal with a statistical approach to fingerprint evidence. These are questions that would be exceptionally helpful in coordinating efforts towards a more transparent and objective probabilistic approach.

Fingerprints, Statistics, Testimony

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