CBD-IAI 2023 Educational Seminar

Abstracts and Lecture Descriptions

CSIpix

Digital imaging workflow for fingerprint comparison: benefits and time savings

This lecture presents the benefits of a digital workflow for fingerprint comparisons. Time-saving opportunities to apply case AFIS-assisted matching in a digital workflow environment are highlighted. This includes topics such as digitally assisted "searching smart" techniques for fingerprint comparison, as well as case management protocols for victim eliminations and large cases. This lecture also reviews general topics of maintaining a digital workflow including the following: image capture, documentation of the ACE-V process, image calibration, enhancement techniques, annotation, side-by-side comparison, report writing, and court chart preparation. CSIpix software is used to demonstrate the concepts during this presentation.

Instructor Bio:

John Guzzwell (M.Sc., MBA, P.Eng.) is an engineer with over 30 years of experience in technology development and commercialization, with a focus on software for forensic image enhancement, comparison, and identification. He has provided training sessions in the use of fingerprint comparison and identification software and presented lectures and workshops at various conferences on topics related to forensic imaging. He is a member of the IAI and is co-founder and VP of Business Development with CSIpix.

Eric Ray:

AFIS Search Tips and New Features *(90 minutes)*

Latent print examiners can increase AFIS search accuracy by following best practice recommendations. Understanding recommendations for image calibration, automation, feature placement, enhancements, search parameters and search strategy are key to efficient and accurate searches. New features and new technology are available that agencies should consider adding as requirements during AFIS upgrades. Imagine a single software solution for your latent print unit – image storage, calibration, enhancements, documentation, database search, manual comparison, verification, consultation, note-taking, report generation, etc. This lecture will summarize best practice recommendations for AFIS searches of IDEMIA databases and then discuss how new features and future technology can further improve accuracy and efficiency.

Latent Print Close Non-Matches *(1 hour)*

As AFIS technology continues to improve and AFIS databases continue to grow, latent print examiners face an increased risk of comparing a close non-match. This presentation discusses historical cases with close non-matches, the situations that increase the likelihood of a Close Non-Match comparisons, and steps to mitigate the risk of error. Multiple examples of Close Non-Matches will be presented, including a sample that resulted in an Erroneous Identification. The session will conclude with a review of the Quality Assurance processes from an accredited laboratory that were implemented after the error.

John Vanderkolk

Forensic Comparative Science: Irritations and Insights

This will be a discussion on the philosophy of human knowing and believing as related to forensic comparative science with an emphasis on the writings of Charles Sanders Peirce and Bernard Lonergan.

Tom Busey and Meredith Coon

Not all Identification Conclusions are Equal: Quantifying the Strength of Fingerprint Decisions

In the pattern comparison disciplines, forensic practitioners evaluate two impressions with respect to the same-source and different-sources propositions. The results are communicated using a pre-determined conclusion scale, and in the friction ridge discipline Identification is typically the highest category on the scale. Although error rates have been measured in most disciplines, there are no widespread quantitative approaches and therefore most conclusions rely on subjective human evaluations. The current work uses decisions provided by fingerprint examiners to produce a quantitative likelihood ratio measure that characterizes the strength of the support for the two propositions. We use an ordered probit model to summarize the distribution of responses of examiners who participated in error rate and validation studies. We then aggregate the data for all image pairs in a database to construct a set of likelihood ratios based on the ratio of the two strength-of-support values. We find that these values are modest relative to values typically produced by DNA analysis or implied by current fingerprint articulation language. The technique can be applied to any pattern comparison discipline for which error-rate data is available, and therefore can be used to appropriately weigh the evidence from different disciplines.

Alice White

Masked and False Minutiae in Friction Ridge Impressions

Each time the ridged skin of the hands or feet contacts a surface, an unique impression of the skin's features is recorded. This means each impression truly only "matches" itself. Two impressions from the same region of ridge skin will inevitably display differences due to the recordings occurring at different moments in time and under different conditions. When conditions are ideal, the feature sets recorded in two impressions of the same region of skin bear remarkable similarities and no "significant" differences. What counts as an insignificant difference? If the examiner notices that the latent print appears to have been made by a finger that was sliding upward under high deposition pressure, the examiner can anticipate that the ridge widths and ridge spacings will be variable through the latent print and these widths and spacings will be recorded differently in the exemplar print. These differences are expected and insignificant. But what if an entire ridge or minutia has gone missing? What if there is an extra ridge or minutia in one of the impressions? Depending on the totality of the feature sets in the latent and exemplar prints, these differences can be quite significant. This lecture will unpack some of the causes of missing and extra minutiae with ground truth examples of how different distortion issues can create these more troubling differences.

Instructor Bio:

Alice (Maceo) White has a Bachelor of Science in Biology from the University of Alaska, Anchorage. She has worked in latent prints since 1997 and was the manager of the Latent Print Detail of the Las Vegas Metropolitan Police Department for 12 years (2006 – 2018). Alice has served on several working groups and professional committees throughout her career. Alice currently serves as a member of the OSAC Friction Ridge Subcommittee and AAFS Standards Board Footwear and Tire Consensus Body. Alice has been a contract instructor since 2006 and is the owner of Evolve Forensics, LLC. She has published multiple articles and provided lectures, workshops, and courses throughout the United States and beyond.