J8 FLASH ID: A Totally Automated, Language Independent Approach for Handwriting Derived Biometric Identification

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After viewing and discussing this presentation, attendees will be familiar with the "FLASH ID" software package developed by the Gannon Technologies Group in collaboration with George Mason University with extensive guidance and technical input provided by forensic document examiners and researcher scientists from the FBI Laboratory.

FLASH ID as a fully operational software system that can address the immediate needs within the forensic community related to using handwriting as a biometric identifier will be presented. The presentation will illustrate how individual features, available and quantifiable within an individual's writing, can be empirically captured into a "loss less" data structure that preserves the topology and geometry of the original writing. The presenta- tion will continue into the statistical analysis of this data structure to capture those elements that link the writing to its writer. A more in-depth discussion of statistical methods will be in a complementary poster presented by Gantz et al. Step-by-step screen shots will be shown illustrating the methods for taking known writing samples and capturing them as a data structure based on Graph Theory replete with both topology and hundreds of detailed physical measurements. It will then be shown how this data structure can be analyzed using statistical methods to distill the topological and physical features into a "biometric kernel." The Biometric Kernel is the statistically derived subset of those measurements that truly captures the essence of an individual's writing. Otherwise stated, the Biometric Kernel consists of those features that hold most consistent within an individual's writing and vary the most across multiple different writers. Once the Biometric Kernel is estab- lished, FLASH ID can act on any unknown sample of handwriting and will return the nearest value in its handwriting reference database that provides the closest match to the questioned writing sample.

A key point to be made to the attendee is how FLASH ID represents a new approach toward using handwriting as a biometric identifier that does not attempt to replicate the actions of a forensic document examiner. Rather, it brings to bear the power of what computers do very well—rapid capture and processing of large quantities of data—into the hands of forensic experts.

This presentation will impact the forensic community by. The core message will be rooted in two important aspects of the technology used to build FLASH ID. First, FLASH ID represents a totally automated process for extracting graphical data from handwritten documents, analyzing this data using established statistical methods and matching documents based on sim- ilarity of the captured writing. Second, the technology underlying FLASH ID is language independent; that is, the empirical and analytical techniques that power the handwriting-derived biometric process have been demon- strated to function in different languages with completely different scripts.

As a residual biometric that can link individuals to documents, hand- writing provides an important data source for both law enforcement and intelligence purposes. In the form of FLASH ID, the forensic science community will now have a tool that harnesses the power of automation to leverage the effectiveness of document examiners by capturing similarities embedded among multiple writing samples and graphically showcasing these similarities supported by the statistical analysis that led to their identification. FLASH ID will also extend document forensics across language barriers— something that is not commonly practiced today.

Handwriting, Biometric, Software

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