B5 Hand Identification Based on Skin Characteristics

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After attending this presentation, attendees will understand inter- and intra-observer reliability when counting commonly found skin features of the hand that may be used in photographic hand comparisons.

This presentation will impact the forensic science community by determining if different examiners see the same features on the same hands, and if the same examiner sees the same features in the same hands. A second goal of this study is to examine how observer reliability is correlated with examiner experience in pattern recognition.

The markers used in this project include moles, freckles, sunspots, and scars. These dermatological features vary in appearance and are a potentially valuable resource for establishing individuality. As these features may form throughout an individual's life, current data and relatively recent photographs are essential. In general, these markings are constant, and such observable skin features have been useful for facial identification; however, oftentimes a suspect's face is not present in a photograph. Hands are a useful alternative, as they may be depicted in images of crimes such as: kidnappings, trophy killings, sexual assault, and child pornography.

Previous research suggests the use of a method for conducting photographic comparisons of the dorsal surface of the hand using fourteen regions. The current research consisted of examining inter-/intra- rater reliability of observers assessing a series of images of the right hand and counting the number of markers in each of these fourteen regions of the hand. Three of the thirty-four images were repeated three times, creating a total of forty images. The sets of images were examined by individuals with various experience levels in pattern recognition and dermatology. It was hypothesized that examiners with more experience would have similar results and that the three repeated hands would have closely correlated values.

Raw data was compared by examiner, region, hand, and repeated hands. The values were cross-correlated to determine the similarity between results for each examiner and for each hand. The results show that high correlation values were obtained for different examiners comparing the same hands, while slightly lower correlation values were obtained when comparing different hands. In general, those examiners with more experience had more correlated results than those with less experience. The repeated hands had comparable values to one another. Further, it seemed that some hands were particularly difficult to examine based on their high ranges and standard deviations across all examiners.

Using hands for identification of an individual will give investigators another tool to use in identifying suspects. Improvements are needed, but this method shows promise for future research and demonstrates the need for experience in image analysis and pattern recognition when conducting photographic comparisons of the hand.

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Inter-/Intra- Observer, Identification, Photographic Comparison

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