## B25 A Morphological Classification of Eyebrows to Aid in Forensic Facial Comparisons

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After attending this presentation, attendees will learn about a facial identification study that supports photographic comparisons as a part of image analysis. In facial identification research, there is very little information pertaining to the uniqueness of eyebrow features to be used in support of facial identification. The basis for conclusions reached through photographic comparison lies in the detection of correspondence or discordance of subject features. At the end of the presentation, the attendees will understand how eyebrow features can be used to support forensic facial comparisons and image analysis examinations. After attending this presentation, attendees will also understand the three main methodologies for forensic facial comparisons. Eyebrow classification based on morphological characteristics for facial comparisons will also be discussed. In addition, the various aspects of the eyebrow that were visualized to create a classification system will be presented along with the results of classifying 112 sets of eyebrows. Finally, further research possibilities in this area will be suggested.

This presentation will impact the forensic community by providing a methodology for the examination of eyebrows when performing forensic facial comparisons or identifications.

The goal of this study was to photograph approximately 100 individuals and then perform side-by-side photographic comparisons to determine if the eyebrow contained individual characteristics to suggest they are unique. In order to evaluate the uniqueness of eyebrows and the morphological characteristics they possess, it was necessary to develop a database of facial images for examination. For this project, 112 individuals volunteered to be photographed. Each photograph was categorized according to general shape, arch height and size (the width of the eyebrow in this instance). While grouping the images, the number of subsets containing distinct characteristics made it rare if any two eyebrows fell into the same category, and many other features were observed that could prove beneficial in determining eyebrow uniqueness. Therefore, the various characteristics were arranged into a table listing each category and an eyebrow classification. The observable features were then assigned a numerical value within each group.

After evaluating each of the 112 photographs and a total of 224 eyebrows, a spreadsheet containing the classification of each image was compiled. Based on the “Eyebrow Classification Table” developed, there were a total of 17 areas examined to aid in classifying each individual’s eyebrows. The spreadsheet depicts that from the 112 individuals who were studied in this project, no two sets of eyebrows classified the same way. Upon analyzing the results obtained from this study, eyebrows appear to be an area that, when adequately examined, may prove valuable as a piece of the puzzle for facial identifications. Since no two individuals’ eyebrows were found to be similar in this study, the utilization of a classification system should aid examiners in developing a universal terminology and methodology for the evaluation of eyebrows for individualization.

While all of the classifications of the eyebrows of 112 individuals in this study were found to be unique, there is still much research that must be completed in order to more thoroughly evaluate this method for use as a facial comparison tool. Future research on this topic may include studies on intra-assessor agreement, photographic variables, the effects of facial expressions on eyebrow characteristics, changes in eyebrows over time, and numerous other possibilities.

Overall, the eyebrow area appears to be a region of the face that is distinguishable between individuals. While eyebrow identification cannot and should not be used as a stand-alone source of individualization, when used in conjunction with other methods of facial comparison, it could prove to be extremely useful. The classification system developed may prove beneficial as a starting point for an examiner attempting to identify an individual from a photograph. In the future, it may be possible to create charts and overlays of standards depicting what constitutes various shapes and sizes of eyebrows. Through training, experience, and with the help of exemplar images depicting various characteristics, examiners throughout the forensic science community will become more accustomed to the examination of eyebrows when performing forensic facial comparisons.

**Morphology, Classification, Facial Identification**

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