B18 Forensic Hand Comparison

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After attending this presentation, attendees will learn about issues with hand comparison and the use of digit ratios in forensic images.

This presentation will impact the forensic science community by illustrating how, in child sexual abuse cases, hand comparison can be useful for finding a relationship with the perpetrator. The limitations and possibilities are shown also in databases of hands of siblings and other public-available databases.

In certain cases, such as child pornography, the faces of the perpetrators are not visible in the images. This makes it hard for forensic investigators to find the perpetrator. However, the hands of the perpetrators, are sometimes present in the image. This research investigates different characteristics of hands in order to find certain hand characteristics which in the future might be used to help identify perpetrators.

In the first test performed, all of the finger length ratios from the Bogazici University database in Turkey have been calculated. The ratios of D2:D5, D3:D5 and D4:D5 are found to have the widest dispersion. These ratios might in the future, when more research is performed, be used to calculate a likelihood ratio.

In the second test, left and right hands of these Turkish individuals were compared to investigate the extent to which these hands are similar. Between the left and right hands the digit ratios differed the most. However, there was almost no difference between the length of the fingers of the left and right hand.

For the third test a database of Dutch siblings was built. A total of 80 siblings (31 men and 49 women) participated in this research.

As a negative control, random individuals were compared to each other. For this test the first individual of every family was compared to the first individual of the subsequent family. This way there was data generated, using the same methods as was used for the siblings, when comparing non-family members. The data of the sibling's investigation is also divided for men and women to see if there are specific characteristics more abundant in either men or women.

In the fourth test five face comparison experts from the Netherlands Forensic Institute were given the questionnaire used in this research and asked to compare five sets of hands. These images of the hand pairs were images of the palm of the hand. The experts were not given a positive and negative control. The different characteristics which were present on the questionnaire could be classified as being 'similar', 'different' or 'non observable'. It has been statistically tested if these researchers had different results from the comparisons using this questionnaire compared to the researcher who conducted all

The most distinctive characters between siblings were the birthmarks and scars on the back of the hand. The shape of the hand was found to be a good indicator for kinship. Also, freckle patterns are found to be more common on female hands than on male hands and the hand palms of brothers differ more than the hand palms of sisters. This research shows that in the future, when more research is performed, digit ratios can be used for forensic comparison.

Hand Comparison, Biometric, Internet

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