F33 Stereometric Analysis of a Human Bite Mark

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After attending this presentation, attendees will understand that it is possible to reduce examiner subjectivity in bite mark analysis by stereometric and photogrammetric techniques.

This presentation will impact the forensic community and/or humanity by potentially allowing the forensic odontologist a more objective methodology for the analysis of human bite marks. Reducing the examiner's subjective bias in bite mark analysis will aid in enhancing the credibility of all forensic odontologists.

The utility of the photogrammetric technique of stereometric analysis for geometrically characterizing human bite marks in forensic applications is demonstrated for a pair of overlapping photographs of a bite mark inflicted by a known perpetrator. In particular, the ability of this technique to support detailed measurements of a variety of bite mark topographic and morphological parameters, suitable for populating a multi-component feature vector, is established. A subset of the bite mark feature parameters, extracted by stereometric analysis, is quantitatively compared against the corresponding values measured from the perpetrator's dental exemplar. The derived error bounds for the selected feature parameters are employed to estimate the probability of match between the bite mark measured features and the corresponding features measured from the perpetrator's dental exemplar, illustrating the potential of this technique as an objective method for quantifying the degree of certainty.

Bite Mark Analysis, Stereometric Analysis, Photogrammetry

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