Quantitative forensic evaluation of bite marks with the aid of a shape analysis computer program: Part 1; the development of 'SCIP' and the Similarity Index

Type: Article

Abstract:

Bite marks left on human tissue and bitten material have become an important aspect of scientific evidence used for the conviction or acquittal of a suspect. Expert opinion has often been based on subjective comparisons rather than any objective metrical analysis and many experts will agree that there is a need to employ additional comparative tests to achieve unbiased objectivity in their investigation. In this study, an interactive shape analysis computer program ('SCIP' - Shape Comparison Interactive Program) has been employed in an attempt to derive experimentally a quantitative comparison, in the form of a Similarity Index (S.I.), between the 'offender's' teeth and the bite marks produced on a standard flat wax form. The S.I. values obtained using 'SCIP' were evaluated in a variety of experimental bite mark situations. It was found that in no case could the S.I. values produced by comparison of the bite mark with the dental casts from non-perpetrators be confused with the much lower S.I. from comparison of the bite mark with the dental cast of the perpetrator. The use of the Similarity Index derived using the 'SCIP' program is recommended as a simple, accurate and objective means of comparing bite marks in suitable forensic cases.

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'SCIP', Bite marks ,Person identification, Quantitative shape analysis, Similarity Index, Wax, accuracy, article, bite, comparative study, computer program ,controlled study, criminal law, dentistry ,female, forensic science, human, male, normal human, offender, priority journal, Bites, Human, Dental Arch, Dental Models, Evaluation Studies, Forensic Dentistry, Image Processing, Computer-Assisted, Least-Squares Analysis, Pattern Recognition, Predictive Value of Tests, Reproducibility of Results, Software

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