

DEVELOPMENT OF A MODIFIED LIKELIHOOD RATIO MODEL FOR MULTI-MODAL BIOMETRIC IDENTIFICATION IN FORENSIC SCIENCE

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Aim: This research work aims at developing a model for Multi-Modal Forensic Examinations (Iris identification, Fingerprint and Handwriting) using modified likelihood ratio in a bid to reduce the problem of inconclusiveness, disagreements and ensure accurate results while establishing a uniform standard for examinations in forensic community.

General Approach: Likelihood Ratio (LR) is a method for measuring the quality of proof in forensic domain. The use of probability proportion in resolving issue usually hit a brick wall in the absence of nuisance parameter.

$$LR \equiv \frac{f(a, b | H_p)}{f(a, b | H_d)}$$

Problem: The LR procedures for some biometrics traits evaluation relies greatly on the choice of appropriate denominator leading to divergent opinion. This usually limits the repeatability and reproducibility of LR estimation. Forensic investigators are unable to model patterns of an individual when capturing these biometric traits which has led to examinations based on examiner's ability solely to his expertise, thus employing some parameters tagged nuisance. Again, studies have shown in different fora that a single biometric trait can be forged. Hence the need for Multi-Modal approach towards a robust Forensic Examination.

Proposed Approach:

