



ELSEVIER

Contents lists available at ScienceDirect

Data in Brief

journal homepage: www.elsevier.com/locate/dib

Data Article

Likelihood ratio data to report the validation of a forensic fingerprint evaluation method

Daniel Ramos^c, Rudolf Haraksim^d, Didier Meuwly^{a,b,*}^a Netherlands Forensic Institute, Laan van Ypenburg 6, 2497GB The Hague, The Netherlands^b University of Twente, Drienerlolaan 5, 7522NB Enschede, The Netherlands^c ATVS – Biometric Recognition Group, Escuela Politecnica Superior, Universidad Autonoma de Madrid, C/ Francisco Tomas y Valiente 11, 28049 Madrid, Spain^d LTS5 – Signal Processing Laboratory, École Polytechnique Fédérale de Lausanne, Faculty of Electrical Engineering, Station 11, CH-1015 Lausanne, Switzerland

ARTICLE INFO

Article history:

Received 6 April 2016

Received in revised form

31 October 2016

Accepted 2 November 2016

Available online 18 November 2016

Keywords:

Method validation

Automatic interpretation method

Strength of evidence

Accreditation

Validation report

Likelihood ratio data

ABSTRACT

Data to which the authors refer to throughout this article are likelihood ratios (LR) computed from the comparison of 5–12 minutiae fingermarks with fingerprints. These LR data are used for the validation of a likelihood ratio (LR) method in forensic evidence evaluation. These data present a necessary asset for conducting validation experiments when validating LR methods used in forensic evidence evaluation and set up validation reports. These data can be also used as a baseline for comparing the fingerprint evidence in the same minutiae configuration as presented in (D. Meuwly, D. Ramos, R. Haraksim,) [1], although the reader should keep in mind that different feature extraction algorithms and different AFIS systems used may produce different LR values. Moreover, these data may serve as a reproducibility exercise, in order to train the generation of validation reports of forensic methods, according to [1]. Alongside the data, a justification and motivation for the use of methods is given. These methods calculate LR from the fingerprint/mark data and are subject to a validation procedure. The choice of using real forensic fingerprint in the validation and simulated data in the development is described and justified. Validation criteria are set for the purpose of validation of the LR methods, which are used to calculate the LR values from the data and the validation report. For privacy and data protection reasons, the original fingerprint/mark images cannot be

DOI of original article: <http://dx.doi.org/10.1016/j.forsciint.2016.03.048>

* Corresponding author at: University of Twente, Drienerlolaan 5, 7522NB Enschede, The Netherlands.

E-mail addresses: d.meuwly@nfi.minvenj.nl, d.meuwly@utwente.nl (D. Meuwly).<http://dx.doi.org/10.1016/j.dib.2016.11.008>2352-3409/© 2016 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

shared. But these images do not constitute the core data for the validation, contrarily to the LRs that are shared.

© 2016 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

Specifications Table

Subject area	<i>Forensic Biometrics</i>
More specific subject area	<i>Forensic Fingerprints</i>
Type of data	<i>Empirical validation report example based on real forensic fingerprint images. Likelihood ratio values computed from those real forensic fingerprints, in order to replicate the validation report.</i>
How data was acquired	<i>Fingerprints scanned using the ACCO 1394S live scanner, converted into the biometric scores using the Motorola BIS 9.1 algorithm.</i>
Data format	<i>Text files, Calibrated likelihood ratios supporting either H_p or H_d propositions</i>
Experimental factors	<i>Biometric scores were treated as per description in paragraph 4.</i>
Experimental features	<i>Same [SS] and Different [DS] source scores were produced using a Motorola AFIS comparison algorithm and used to compute the LR values as described in paragraph 5.</i>
Data source location	<i>Netherlands Forensic Institute, Laan van Ypenburg 6, 2497 GB, The Hague, The Netherlands</i>
Data accessibility	<i>Data is with the article.</i>

Value of the data

- Real forensic data in a form of LR values suitable for validation and performance evaluation are provided. The availability of LRs from forensically relevant data is limited, which increases the value of these data.
- Complete empirical validation case study presented in a form of a validation report including a validation decision is provided. The data serve for reproducibility of validation reports of automatic forensic evaluation methods as described in [1].
- The performance characteristics of the LR method developed is measured in terms of accuracy, discriminating power, calibration, generalization, coherence and robustness [1], provided in a form of calibrated likelihood ratios for both – the baseline and the multimodal LR method.

1. Data

The term “data” is used to denote the LR values, which are produced using two different LR methods presented below. The data are shared with the forensic biometric community, alongside with the description of an empirical example of a validation report generated using the LR values, which is included in [2]. The LR data can be used to reproduce the validation experiments for the accuracy, discriminating power and calibration in the validation report in [2]. The validation report is of potential interest of forensic researchers who aim to validate and accredit their LR systems/LR methods, and the data presented here are of use to assess the reproducibility of the results presented in the report. Presented below is an experimental design, materials, methods as well as the datasets used to produce the LR values.

Download English Version:

<https://daneshyari.com/en/article/4765248>

Download Persian Version:

<https://daneshyari.com/article/4765248>

[Daneshyari.com](https://daneshyari.com)