

# ISO/IEC 19795-10:2024-10 (E)

## Information technology - Biometric performance testing and reporting - Part 10: Quantifying biometric system performance variation across demographic groups

### Contents

Page

- Foreword..... v
- Introduction..... vi
- 1 Scope..... 1
- 2 Normative references..... 1
- 3 Terms and definitions..... 2
- 4 Conformance..... 4
- 5 Planning the evaluation..... 4
  - 5.1 Identifying the scope of the evaluation..... 4
  - 5.2 Demographic variables..... 5
    - 5.2.1 Ground truth requirements..... 5
    - 5.2.2 Categorical demographic variables..... 5
    - 5.2.3 Continuous demographic variables..... 7
    - 5.2.4 Other demographic variables..... 8
- 6 Executing the evaluation..... 8
  - 6.1 Generation of mated comparison and identification trials..... 8
  - 6.2 Generation of non-mated comparison and identification trials..... 8
    - 6.2.1 General..... 8
    - 6.2.2 Verification (1:1)..... 8
    - 6.2.3 Identification (1:N)..... 8
  - 6.3 Selection of a threshold..... 9
  - 6.4 Calculating differential performance based on categorical variables for two specific demographic groups..... 9
    - 6.4.1 General..... 9
    - 6.4.2 Differential performance between two groups based on mathematical difference..... 9
    - 6.4.3 Differential performance between two groups based on mathematical ratio..... 10
  - 6.5 Calculating differential performance based on categorical variables for more than two groups..... 10
    - 6.5.1 General..... 10
    - 6.5.2 Differential performance for more than two groups based on the largest error rate relative to the geometric mean..... 10
    - 6.5.3 Differential performance for more than two groups based on the Gini coefficient..... 11
  - 6.6 Calculating differential performance in identification trials..... 11
  - 6.7 Calculating demographic differentials for failure-to-enrol rate, failure-to-acquire rate and transaction duration..... 12
  - 6.8 Calculating demographic differentials for continuous variables..... 12
  - 6.9 Comparison score differential measures..... 13
  - 6.10 Calculating uncertainty..... 14
    - 6.10.1 Uncertainty in demographic differentials..... 14
    - 6.10.2 Sampling the target population..... 14
    - 6.10.3 Sample size requirements..... 15
- 7 Reporting the evaluation results..... 16
  - 7.1 Reporting the experimental design..... 16
  - 7.2 Reporting the target application..... 16
  - 7.3 Reporting the test population..... 16
  - 7.4 Reporting differential performance..... 17
    - 7.4.1 Reporting differential performance on previously collected datasets..... 17
    - 7.4.2 Reporting differential performance for two or more groups..... 17

7.4.3	Reporting differential performance against a benchmark .....	18
7.4.4	Reporting error trade-off metrics .....	18
7.4.5	Reporting threshold management policy.....	18
7.5	Reporting comparison score differential measures .....	18
7.6	Reporting exception handling .....	19
<b>Annex A (informative) Example of estimating sample size for differential performance.....</b>		<b>20</b>
<b>Annex B (informative) Calculating aggregate equitability measures.....</b>		<b>23</b>
<b>Bibliography.....</b>		<b>25</b>