ISO/IEC 19795
Biometric Performance Testing and Reporting

Multipart standard concerned with "technical performance testing" of biometric systems.

Technical performance testing seeks to determine error rates
(false positive and false negative decisions,
failure-to-enrol and failure-to-acquire)
and throughput rates, with the goal of understanding and predicting the real-world error and throughput performance of biometric systems.

Biometric technical performance testing can be of three types: technology, scenario or operational evaluation.
Each type requires a different protocols and produces different types of results, and there are further differences due to the wide variety of biometric modes, devices, sensors, vendor instructions, data acquisition methods, target applications and populations.

- Part 1: Principles and framework

- Part 2: Testing methodologies for technology and scenario evaluation

- Part 3: Modality-specific testing [Technical Report]

- Part 4: Interoperability performance testing

- Part 5: Access control scenario and grading scheme

- Part 6: Testing methodologies for operational evaluation

- Part 7: Testing of on-card biometric comparison algorithms

ISO/IEC 19795-1: 2006

Biometric Performance Testing and Reporting

Part 1: Principles and Framework

19795-1   Scope

- Establishes general principles for testing the performance of biometrics systems in terms of error rates and throughput rates
- Specifies performance metrics for biometric systems;
- Specifies requirements on test methods, recording of data and reporting of results; and
- Provides a framework for developing & describing test protocols, to:
    - avoid bias due to inappropriate data collection or analytic procedures
    - achieve the best estimate of field performance for the expended effort
    - clarify the the limits of applicability of the test results.

- The standard is applicable to *empirical performance testing* of biometric systems and algorithms through analysis of the matching scores and decisions output by the system, without detailed knowledge of the system's algorithms or of the underlying distribution of biometric characteristics in the population of interest.

- **Out of scope:** Measurement of performance for people deliberately trying to circumvent correct recognition by the biometric system (i.e. active impostors).

ISO/IEC 19795-6:2012

Biometric performance testing and reporting —

Part 6: Testing methodologies for operational evaluation

What makes operational evaluation different?

Operational evaluation differs from technology or scenario evaluation
- Subjects, environment, system design are not controlled for the purpose of repeatable testing, but vary in accordance with operational use. E.g.
  - legitimacy of the subject's identity claim
  - environmental effects from weather or lighting,
  - variability of system use by different individuals

Recognition metrics
- System rejection rate / System identification rate
  that do not require "ground truth" on subjects identity
- System rejection rate would include rejections in which the subject did not provide an ideal presentation or did not correctly follow instructions

Determining false accept rate / false reject rate from the number of system rejections and acceptances requires additional observations or controls to determine the legitimacy of identity claims and device interactions.

Technical report

ISO/IEC PDTR 29189

Evaluation of examiner-assisted biometric applications

What makes evaluating examiner assisted biometric systems different?

An Examiner assisted biometric system:

- reliant on the interaction and skill of a human examiner in the biometric process, be it data capture, enrolment, template generation or final decision
- uses a combination of the Examiner's input and the functionality of the biometric algorithm
- will likely have inbuilt toolsets to assist the Examiner in enrolling biometric samples, and when comparing the top match results provided by the biometric algorithm.

The Examiner is typically:

- a field expert in the biometric modality being exploited
- trained to use the system to an advanced degree of proficiency
- authorised to override the biometric system's decisions, based on their own examination of the biometric samples and the results returned.