



The ISO/IEC 19795 Biometric Performance Testing and Reporting standard

**Other SC37 WG5 standards:
ISO/IEC 29156, 29197, 29198**

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ISO/IEC TR 29156 (4th WD)

Guidance for specifying performance requirements to meet security and usability needs in applications using biometrics

Scope

- Guidance on the use of biometrics WITH and WITHOUT the use of a second factor
 - Guidance on comparing and quantifying security and usability in authentication mechanisms
- Security and Usability, not only technical performance, but also on technical, human and procedural vulnerabilities
- Conditions in maintaining security and usability
- DOES NOT cover identification, only verification and enrolment
- Target small to medium systems, although much of the content is applicable to large-scale systems
- Seeking a balance between security and usability

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- Security failures:
 - Inherent limitations
 - Failures of design, implementation and/or operation
- Security requirements to establish:
 - Acceptable level of false acceptance
 - Impact of failure to enrol (how secure is the intended secondary procedure? Is a secondary biometric needed?)
 - Resistance to/detection of active imposter attacks at the biometric sensor point of attack (spoofing, liveness, artefacts,...)
 - Detection of physical attack/tampering
 - Detection of non-zero effort imposter attacks using liveness or artifact detection
 - Methods to mitigate attacks
 - Adjustable threshold setting (s) for changes in the threat state (increased alert level)

Usability and Use Cases

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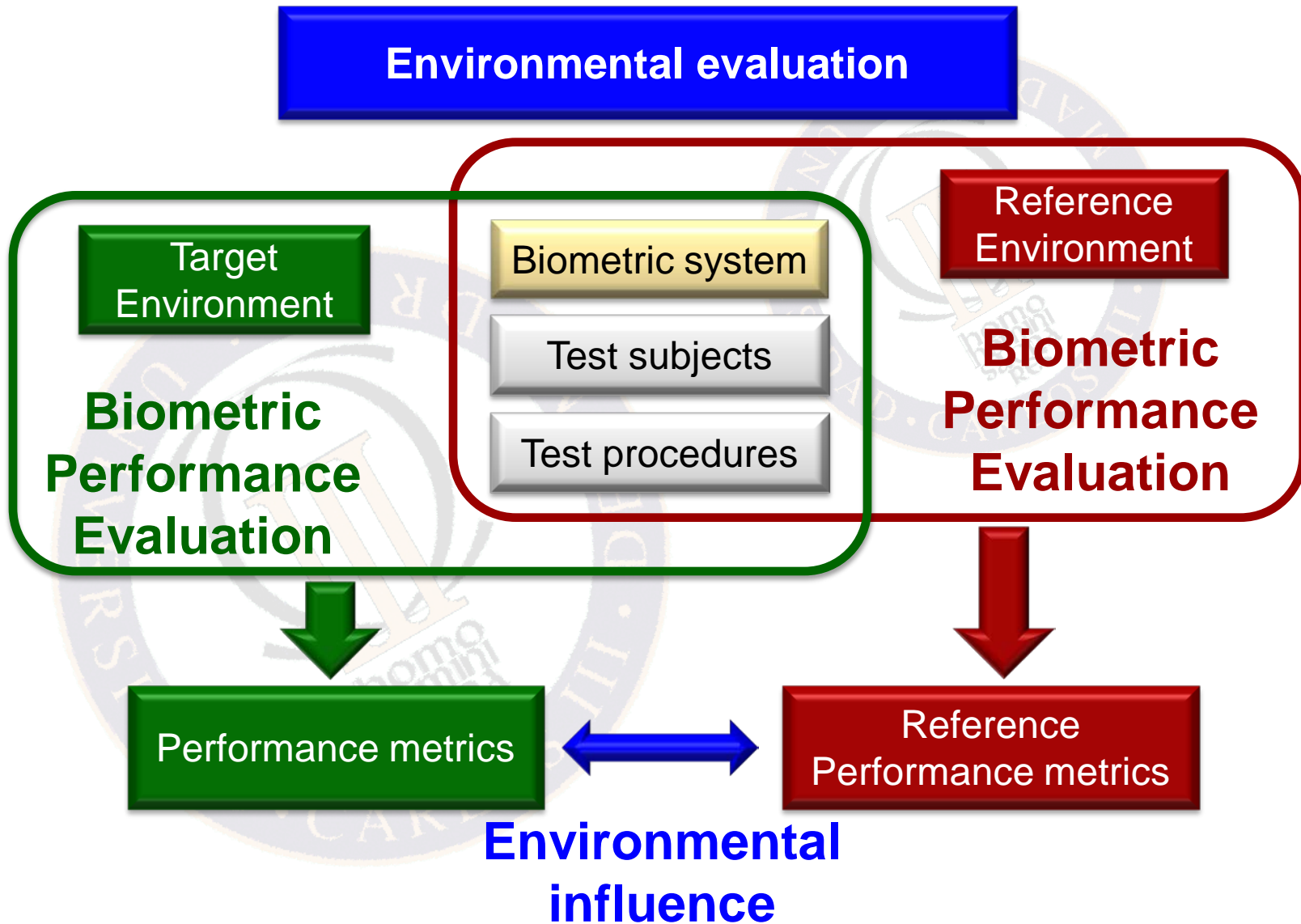
- Usability requirements to establish:
 - Ergonomics
 - Performance aspects (throughput, FTA, FRR, etc.)
 - Methods to reduce FRR such as training, signage, subject feedback (at the sensor), ways to encourage habituation
 - Dynamic template updating
 - Re-enrolment of subjects (periodically or based on trend monitoring and detection of high FRR individuals)
- Use cases illustrated:
 - Time and attendance
 - Physical access control
 - Computer sign-on
 - E-authentication
 - Point of Commerce
- Annex C contains information about Risk Assessment



ISO/IEC 29197 (5th WD)

Evaluation methodology for
environmental influence in biometric
system performance

Introduction



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Introduction

- Environmental conditions
 - Atmosphere parameters: temperature, humidity, etc
 - Physical and chemical phenomena: illumination, noise, vibration, etc
- “End-to-end” biometric performance evaluation
 - Scenario evaluation
 - Modelled environment considering a real-world target application and population
 - In accordance to ISO/IEC 19795-2: Testing methodologies for technology and scenario evaluation
 - Operational evaluation
 - Real environments using a target population
 - In accordance to ISO/IEC 19795-6: Testing methodologies for operational evaluation

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This standard addresses...

- Requirements for planning and execution of environmental testing evaluations for biometric systems based on scenario and operational evaluations
- Specifications to define, establish and measure specific conditions to assess
- Requirements for establishing a baseline performance in order to compare the influence of environmental parameters
- A specification of the biometric evaluation including requirements for test population, test protocols, data to record and test results
- Procedures for carrying out the overall evaluations

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This standard does not ...

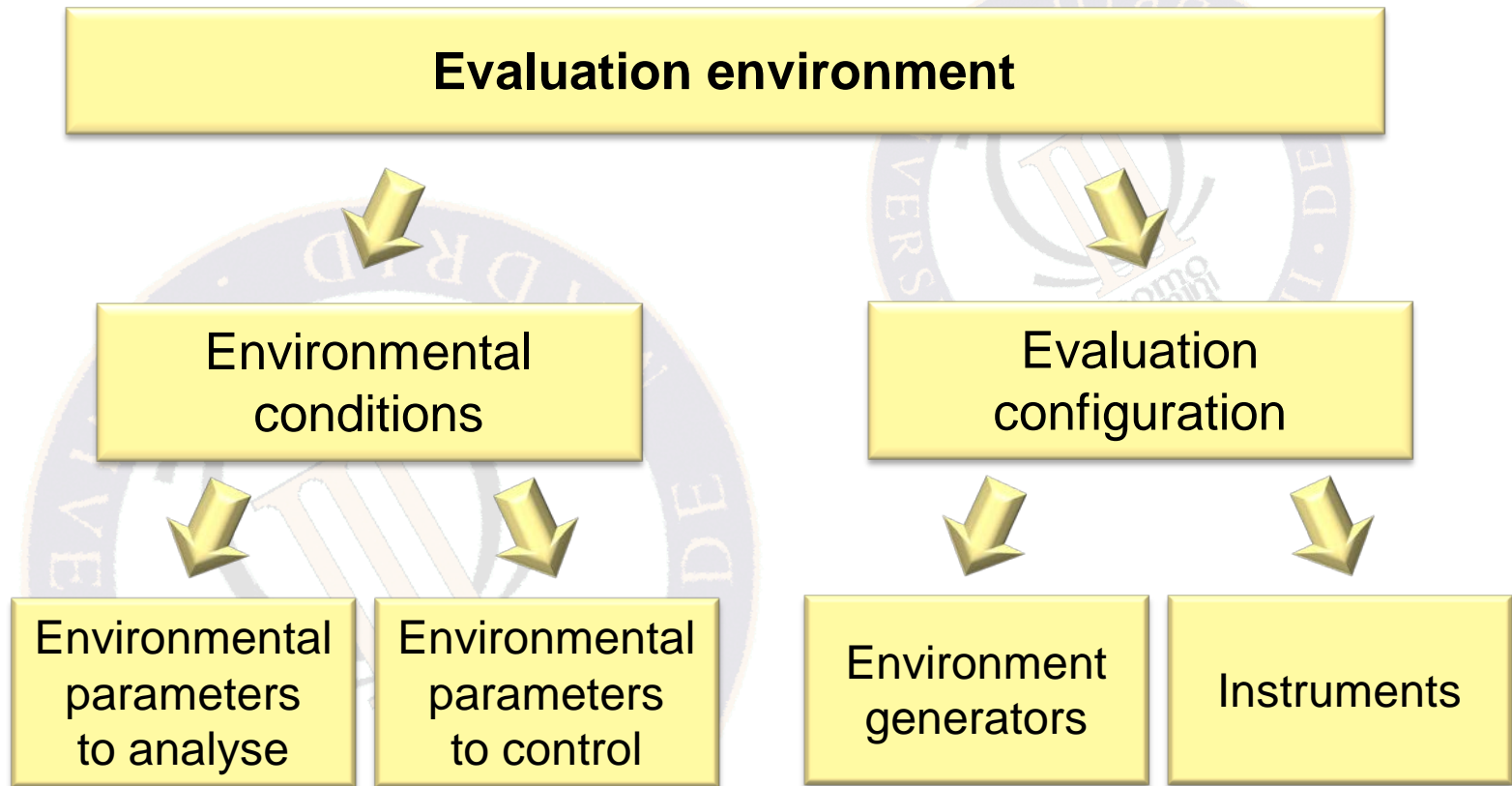
- Determine which parameters shall be analyzed for a specific biometric modality
 - ISO/IEC TR 19795-3: Modality specific testing
- Specify requirements to perform a vulnerability analysis modifying environmental factors
- Classify biometric systems upon performance against different environmental conditions
- Specify requirements for determining the functional effects of environmental conditions on hardware components of biometric systems

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Overview



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Scenario evaluation

- Suitable for:
 - Measuring the influence **of one or a combination of** environmental parameters
 - Analyse an specific controlled environment
- Requirements related to:
 - Environment
 - Test population: size, selection, training, guidance
 - Acclimatization
 - Level of effort and decision policies
 - Error protocols
 - Data to record and test results
 - Execution sequence

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Operational evaluation

- Suitable for:
 - Measuring biometric systems performance in their operational environment
- Requirements related to:
 - Environment
 - Test period
 - Data recording processes
 - Performance measurements
 - Establishment of baseline performance
 - Impostor transactions
 - Reporting

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ISO/IEC TR 29198 (PDTR)

Characterization and measurement of
difficulty for fingerprint databases for
technology evaluation

Scope

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- Scope:
 - characterizing level of difficulty attributable to differences between samples acquired from the same finger,
 - developing statistical methodologies for representing the level of difficulty of a fingerprint dataset by aggregating influencing factors,
 - comparing the level of difficulty of different fingerprint datasets,
 - defining procedures for testing and reporting the level of difficulty of fingerprint datasets collected for technology evaluation,
 - describing the archived data selection methodology for building a dataset for evaluation
- Outside of the scope is:
 - Defining the quality of individual fingerprint images,
 - Defining the methodologies or explicit measures for evaluating or predicting the performance of fingerprint recognition algorithms

Overview

- It provides the explanation about the differential factors in fingerprint images
 - Capabilities of the capture device
 - Environmental conditions
 - Demographics
 - Intrinsic to the biological characteristics of the modality
 - Usability
 - Common area among samples
 - Relative deformation among samples
 - Relative sample quality among samples and within the ones used to get the biometric reference

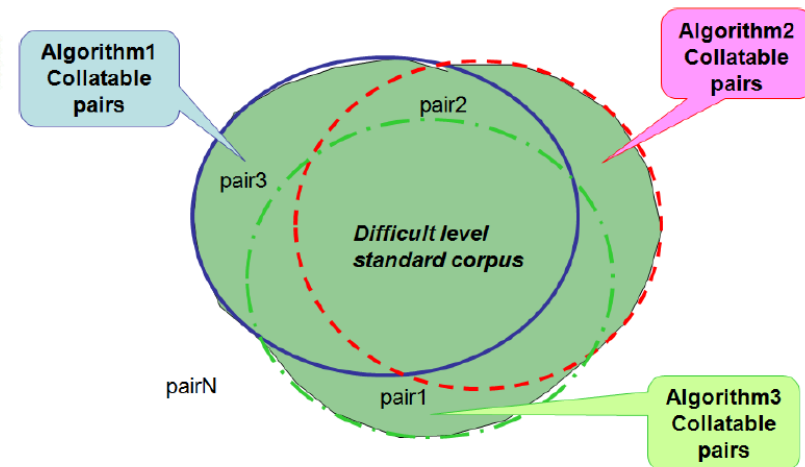
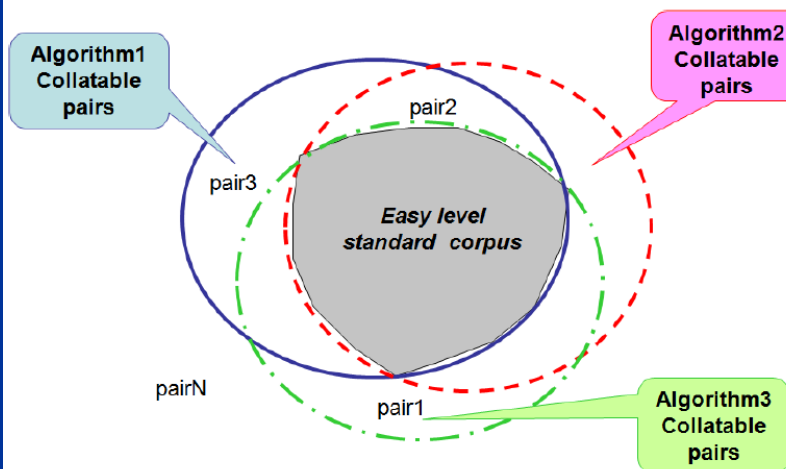
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Metrics

- It also provides the way to calculate the Level Of Difficulty of the dataset:
 - Measuring the LOD of individual pairs
- And how to analyze mated pair data characteristics based on comparison scores
- Finally it provides the way databases can be built for achieving different levels of difficulty:
 - Easy-level
 - Difficult-level



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THANK YOU FOR YOUR ATTENTION

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