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

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- 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

Security

- 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)

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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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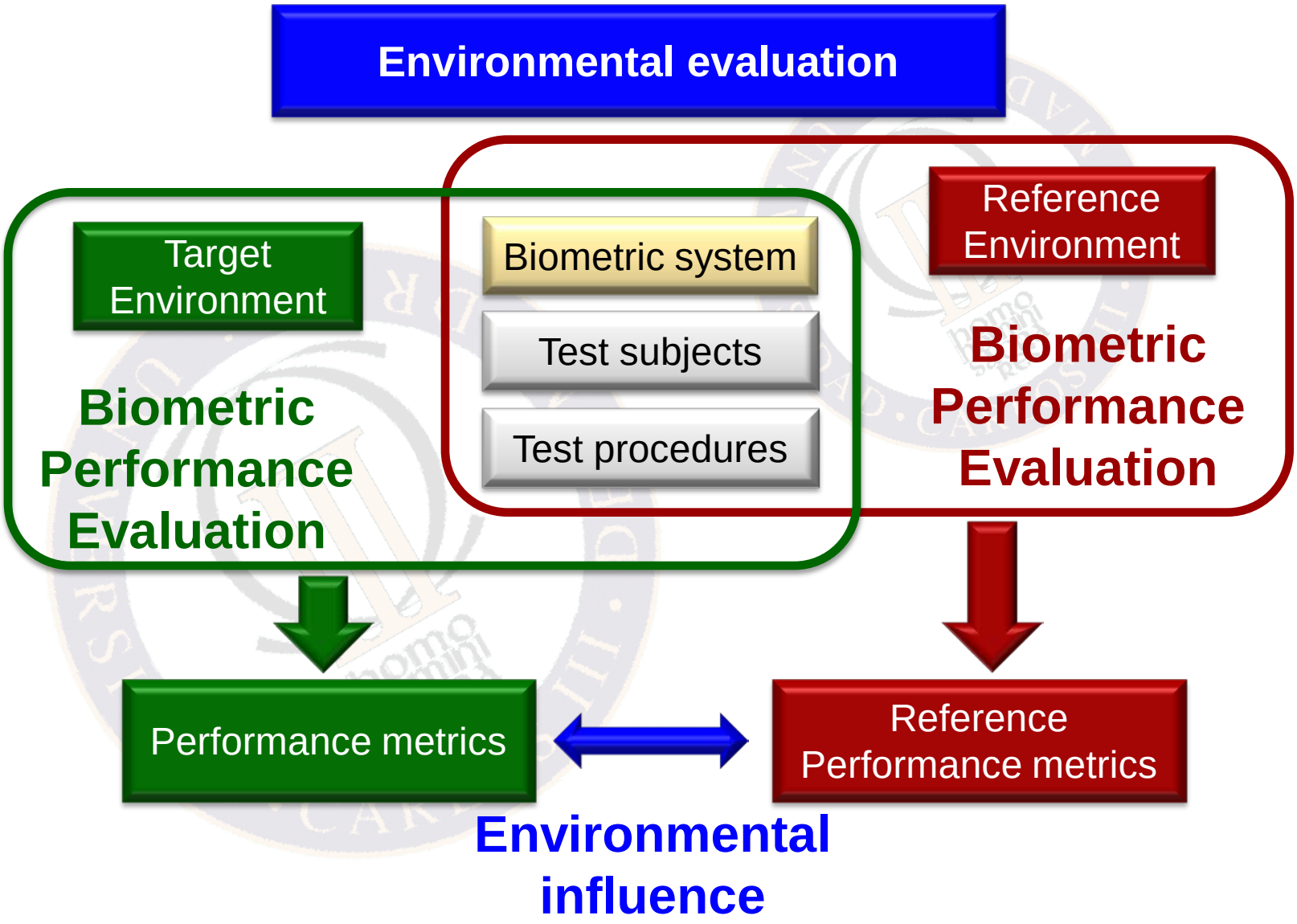

Introduction

- 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…

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- 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

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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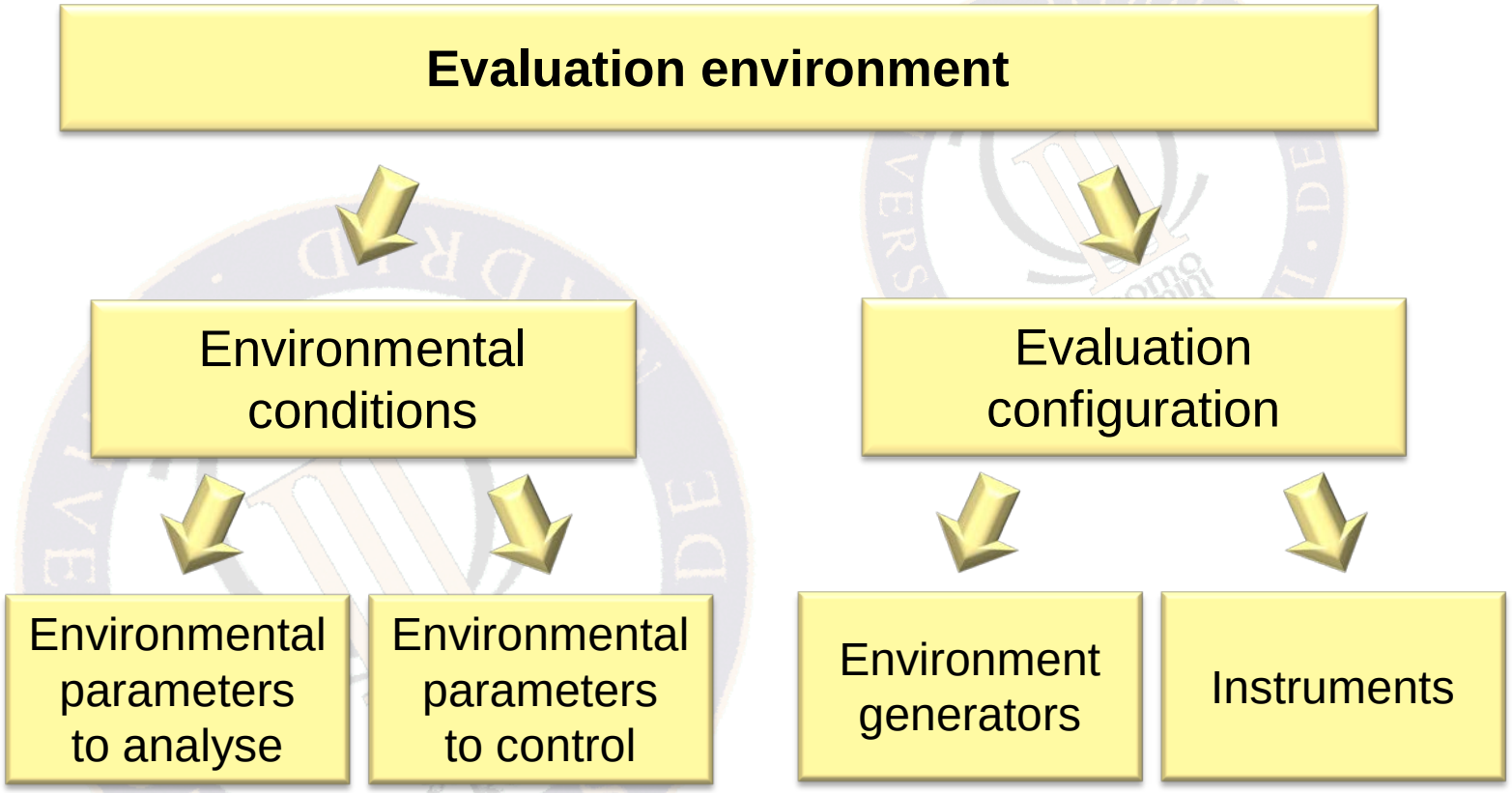

Scenario evaluation

- 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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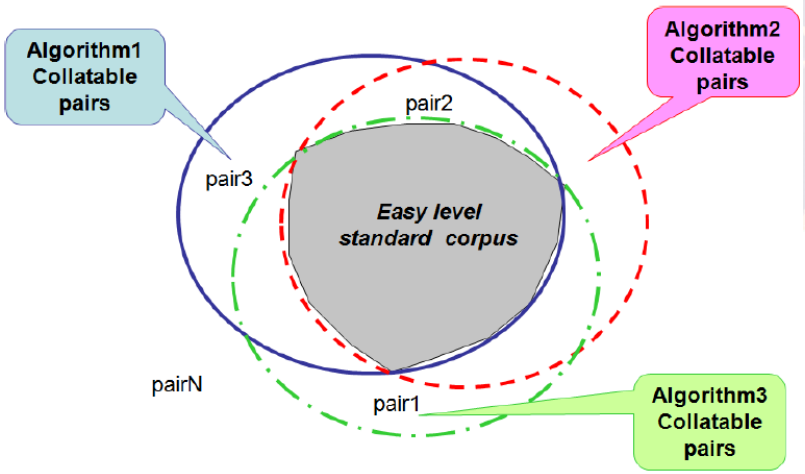

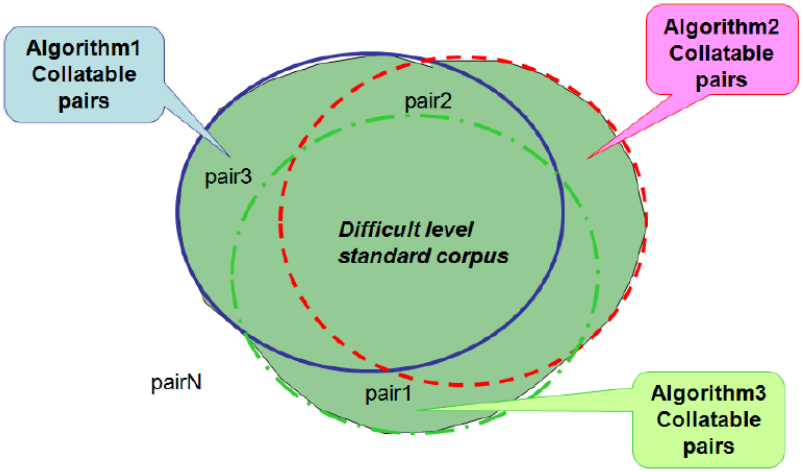

THANK YOU
FOR YOUR ATTENTION

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