ISO/IEC Working Draft 29197: Evaluation Methodology for Environmental Influence in Biometric System Performance

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Outline

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Introduction

● Environment is a relevant factor that can affect biometric performance negatively

● However a specific methodology for measuring how much performance is affected does not exits

● A NWI was proposed for developing this methodology

● It was accepted in 2009
  - PoW of JTC1/SC37/WG5
  - ISO/IEC 29197 project

● Current stage: 4th Working Draft
Introduction

ISO/IEC 29197

Project

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Environmental evaluation

Biometric system

Test subjects

Test procedures

Reference Environment

Biometric Performance Evaluation

Target Environment

Biometric Performance Evaluation

Performance metrics

Reference Performance metrics

Environmental influence
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
ISO/IEC 29197 (III)

Biometric Performance Evaluation

Enrolment

Enrolment evaluation conditions

Verification

Reference evaluation environment

Verification evaluation conditions

Evaluation environments
ISO/IEC 29197 (IV)

- Evaluation environment
  - Environmental conditions
    - Environmental parameters to analyse
    - Environmental parameters to control
  - Evaluation configuration
    - Environment generators
    - Instruments

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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
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
Evaluation conditions specification

● Definition of evaluation conditions
  ➢ Reference evaluation environment
  ➢ Types of evaluation conditions
  ➢ Selection of the evaluation conditions
    ▪ Enrolment evaluation conditions
    ▪ Verification evaluation conditions

● Measurement and record of the environmental conditions
  ➢ Instruments to measure and record environmental conditions
  ➢ Requirements for measuring and recording environmental conditions
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
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
Contributions

- Comments and contributions are welcomed

- Specifically on the following issues:
  - Evaluation conditions specification
    - Evaluation conditions for operational evaluations
  - Scenario evaluation
    - Requirements for recording and reporting results
  - Operational evaluation
    - Establishment of baseline performance
THANK YOU FOR YOUR ATTENTION

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