

# Open Source Face Image Quality (OFIQ) An Overview

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## Outline

The Open Source Face Image  
Quality (OFIQ) implementation

Motivation for OFIQ

Project OFIQ

# Welcome!



# The Open Source Face Image Quality (OFIQ) implementation



- Facial images are widely used in public sector applications such as EES and VIS
- Quality assessment of facial images is important to ensure system performance
- Quality components affect recognition performance but can also be relevant to control compliance with existing regulations (e.g. the EES implementing decision 2019/329)
- A common approach to quality assessment is essential
- Assessment of fingerprint images by NFIQ2.2 is standard procedure. But currently we have no equivalent open source solution for facial images
- We need „NFIQ for Face“ → why?

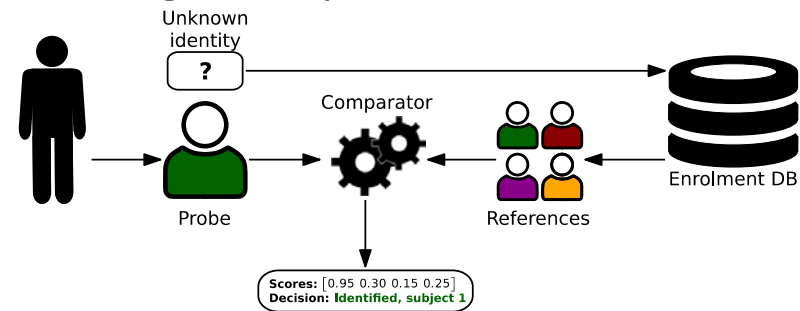


Image source: <https://www.schengenvisainfo.com/wp-content/uploads/2018/11/Entry-Exit-System-EES.jpg>



# Motivation for OFIQ: Quality matters

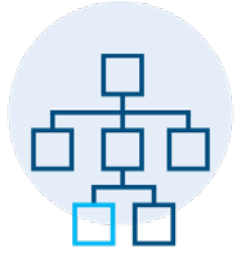
- The quality of facial images has an impact on the recognition performance.
- In large scale databases, such as EES, quality requirements are therefore immensely high.



- Good data quality is essential for overall system performance.
- But: What does “good” mean?
- The necessary quality level depends on the specific application scenario which can be quite diverse.



Image source: <http://solutions.ait.ac.th/garbage-in-garbage-out/>



# Motivation for OFIQ: Quality in diverse scenarios

- The scenarios in which facial images are used are very different (border control only being one of them).
  - All scenarios come with different requirements and needs.
  - There are many different vendors and solutions.
  - Even within one application scenario (e.g. border control), different solutions may be used (e.g. self-service system followed by manual border control).
- Biometric samples might be fed into different backend systems (EES, VIS, ...). It is important to ensure interoperability and harmonize requirements.
- At enrolment stage, recognition algorithms might be unknown (and black box).
- A standardized quality assessment is important when the application landscape is diverse





# Motivation for OFIQ: Quality versus transaction time

- Remember
  - Quality requirements depend on the system in question (ABC gate versus Smartphone).
  - The aim is to reach the desired quality level in the minimum of time not to achieve the maximum quality. Quality is not an end in itself.
  - It is advantageous to know the required quality level of the target system and to align to it.
- Producing "good" quality is "expensive" (in the sense of "time-consuming"), especially in distributed systems.
- There are different components that potentially affect the quality of a facial image. Components might be time-consuming to control without enhancing the overall quality significantly.
- OFIQ will focus on the essential quality components and one unified quality score

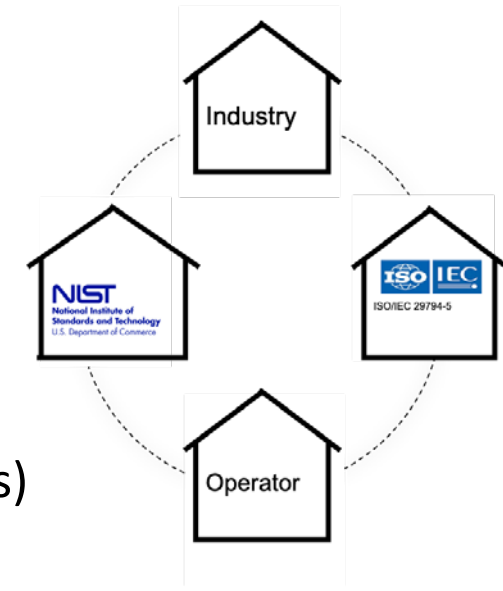


Image source: <https://www.flaticon.com/jpg>



# Motivation for OFIQ: Harmonization and Open Source

- Facial image quality is not standardized yet.
  - Standardization and harmonization is key, especially in the view of (semantic) interoperability.
  - ISO/IEC 29794-5 will give us a common understanding of measuring facial image quality in a specific application scenario.
- We need a reference implementation of the ISO/IEC 29794-5 -> OFIQ
  - OFIQ will allow for alignment of all stakeholders (researchers, vendors, system architects, etc.)
  - Flexible software framework (usable for ABC gates and for Smartphones)
  - Contribution to ISO 29794-5
  - Open Source solution, which can be integrated in commercial systems (i.e. products)





# Motivation for OFIQ: Summary

- Quality matters, especially in large-scale databases and with diverse application scenarios.
- Garbage in, garbage out! Good data quality is essential but what does “good” mean?
- Quality requirements depend on application context. A common approach is important.
- Quality is often a question of time. Specific components contribute differently to overall quality.
- Standardization and harmonization is essential for (semantic) interoperability.
  
- Reference implementation OFIQ (open source)
- Project by German Federal Office for Information Security (BSI)





# Project OFIQ: Overview

- January 2022 – Mid 2024
- Open source implementation, public documentation, public state of the art reports (see [arXiv.org](https://arxiv.org))
- Current state: Prototyping and evaluation of quality components, NIST benchmarking
- Different other projects to align to, e.g. Live Enrolment activities in Germany

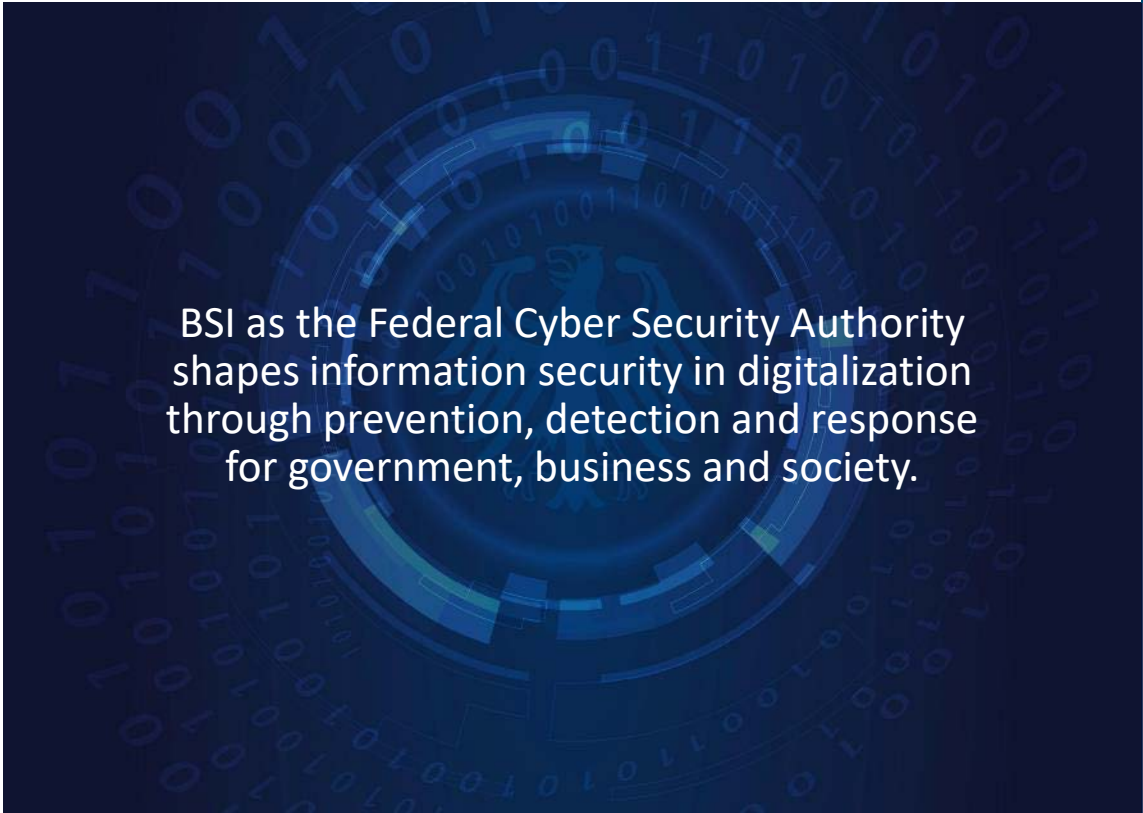
# Thank you for your attention!

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