OFIQ: “Open-source Face Image Quality”
Frequently Asked Questions (FAQs)

I. QUESTIONS ABOUT OFIQ

If the reply to your query is not found below, OFIQ users can address general questions regarding the tool to: OFIQ@eulisa.europa.eu

II. FAQs

Question: Which use cases have been considered in the development of OFIQ?

Answer: The OFIQ was designed to serve the following use cases (UC):

- **UC 1**: Collection of reference samples for ID documents. The face image will be stored on a document, used for example for a maximum of 10 years and should support human examination.
- **UC 2**: System enrolment, current or later creation of a reference, delayed recognition. Acquisition of face images where quality should be high enough to ensure later usage and interoperability.
- **UC 3**: Collection of probe samples for instantaneous recognition by comparison with a reference image acquired in UC1 or UC2.

Question: Is Entry-Exit-System the only use case for OFIQ or can the software be used in other use cases? Will the OFIQ software be available to support facial examiners?

Answer: Although OFIQ was designed for the three use cases outlined above, the software is flexible and can be used for many more use cases, such as supporting facial examiners.

Question: Does OFIQ work for passport images that need to be compared with probe images captured from the traveller?

Answer: By definition of the ISO/IEC 29794-5 standard the passport enrolment is UC1, the assessment of probe live images for immediate 1:1 verification is UC3.

Question: How does OFIQ relate to the ICAO requirements and to the ICAO portrait report?

Answer: OFIQ is the reference implementation of the international standard ISO/IEC 29794-5:2025. This standard defines algorithms that quantify how a face image’s properties conform with those of canonical face images specified in ISO/IEC 39794-5:2019 Annex D.1, commonly known as ICAO requirements. The Annex D.1 was formerly published as ICAO portrait quality report.

Question: What is considered as occlusion and how does the occlusion prevention function with glasses?

Answer: All opaque parts of glasses are considered as occlusions (which they are), while transparent eyeglass lenses are not considered as occlusion. The algorithm counts frames of the glasses, non-transparent eyeglass lenses and saturated reflections on lenses as occlusions. Lenses of glasses are considered as occlusion if they are either opaque or if they are coloured and their colour differs considerably from the skin colour. Facial hair (beards, moustaches, eye brows) is not considered as occlusion. More details on what is considered as occlusion can be found in Section 4.3.3.1 of the OFIQ report “Implementation and Evaluation of Algorithms”. See:

https://github.com/BSI-OFIQ/OFIQ-Project/blob/main/doc/reports/Public_Report_V1.2_2024_11_06.pdf.

Question: Is there a plan for OFIQ-2 to enhance the current implementation of background uniformity measurement based on luminance image gradients?

Answer: Yes, the OFIQ-team has already an implemented improvement, which will soon be tested with NIST FATE SIDD. This improvement is planned for in OFIQ-2.

Question: Why was the Laplace filter used for the sharpness measure? Is it not that young people, due to their smooth skin, will have a low score and older people with significant age marks, will get a higher score?

Answer: The sharpness measure uses more features than just the Laplace filter. The sharpness component quality measure (CQM) is a classifier trained on a combination of features from the Laplacian, Sobel and mean-diff filter.

Question: What threshold should be chosen for the unified quality score? Are there recommended threshold to reject images?

Answer: The threshold for the unified quality score depends on the system and use case in question but that has no effect on compliance regarding ISO/IEC 29794-5. This standard does not define thresholds. The ISO/IEC AWI 25722 technical report will provide best practices as recommended thresholds for quality measures values in each use case. See:

https://www.iso.org/standard/91308.html

Question: Is it correct that ideally each system should have its own OFIQ threshold being specifically defined by calibration in order to minimize the false non-match rate (FNMR)?

Answer: The UnifiedQualityScore (OFIQ-UQS) is emitting values between 0 (very bad) and 100 (very good). It depends on the application which criteria to apply to accept or reject an image. The ISO/IEC AWI 25722 technical report will provide best practices for thresholds in each use case. See:

https://www.iso.org/standard/91308.html

Question: How does skin colour influence the calculation of under and over exposure?

Answer: Demographic variability for the exposure measures is a known fact. This is reported in the ISO/IEC AWI 25722 technical report. New algorithms for the exposure component quality are investigated and will be included in OFIQ-2. See:

https://www.iso.org/standard/91308.html.

Question: Is it very difficult to assess quallity measures for yaw and pitch correctness?

Answer: The head pose estimation is based on CNNs. You can find the details on that in Sections 7.10.2 and 7.10.3 of the OFIQ report. See:

https://github.com/BSI-OFIQ/OFIQ-Project/blob/main/doc/reports/Public_Report_V1.2_2024_11_06.pdf

Question: What databases were used to train or validate the OFIQ quality measures?

Answer: The databases used in the validation have been documented in the OFIQ report “Implementation and Evaluation of Algorithms”. See:

https://github.com/BSI-OFIQ/OFIQ-Project/blob/main/doc/reports/Public_Report_V1.2_2024_11_06.pdf

For the evaluation you can also read the NIST-FATE-SIDD report. See:

https://pages.nist.gov/frvt/reports/quality_sidd/frvt_quality_sidd_report.pdf

Question: What models have been used for OFIQ quality measures?

Answer: The models have been documented in the OFIQ report “Implementation and Evaluation of Algorithms”:

https://github.com/BSI-OFIQ/OFIQ-Project/blob/main/doc/reports/Public_Report_V1.2_2024_11_06.pdf

and are downloadable from the dedicated eu-LISA webpage to OFIQ:

https://resources.eulisa.europa.eu/research/OFIQ-Models.zip

Question: What can you say about performance differences in terms of transaction times between 480x640 pixel images to 1200x1600 in terms of OFIQ results?

Answer: The face detection algorithm used in OFIQ can take longer for very large images due to memory allocation, but for images with moderate dimensions, the processing time is independent of the image dimensions. The only quality component algorithm, for which the processing time scales with the image dimension (even for moderate dimensions) is sharpness. In OFIQ-2, the algorithms will be improved so that the processing times don’t significantly depend on the image dimensions.

Question: How is OFIQ supporting mobile devices?

Answer: OFIQ runs on mobile devices (Android and iOS). As of version 1.1.0, an instruction for compiling on mobile devices will be provided in:

https://github.com/BSI-OFIQ/OFIQ-Project/blob/main/mobile/BUILD.md

Question: How can OFIQ be used with other programming languages, such as Python and Java?

Answer: The binding for other programming languages is on the roadmap of the OFIQ-team. For the time being Python programmers can use the non-official Python Adapter:

https://github.com/torss/OFIQ-Project/tree/zeromq

Question: Where can I find a pre-compiled version of the OFIQ software?

Answer: The pre-compiled OFIQ binaries, as well as dependencies with external libraries, can be downloaded from the eu-LISA dedicated webpage to OFIQ. See:

https://resources.eulisa.europa.eu/research/OFIQ-PrecompiledBinaries.zip

https://resources.eulisa.europa.eu/research/OFIQ-ExternalLibraryDependencies.zip

Question: OpenCV has some methods that will give different results on x86 and arm, and this can influence output of down stream neural nets. Does this cause a problem for OFIQ component quality measures (CQM)?

Answer: The only CNN that OFIQ executes with OpenCV is the face detector. All other CNNs are executed using ONNXRuntime. However, deviations across different platforms can occur. For this reason, the ISO/IEC 29794-5 Annex A formulates conformance tests assertions, which allow a deviation of the quality component value by 1.

Question: Which test images shall be used in a conformance test and where can I find the target values for quality component values that are constituting the conformance test with ISO/IEC 29794-5?

Answer: The conformance test images can be downloaded from the eu-LISA dedicated webpage to OFIQ. The target values for these conformance test images, contained in ISO/IEC 29794-5 Annex A, are also included in the file with the test images. See:

https://resources.eulisa.europa.eu/research/OFIQ-ImagesConformanceTest+TargetValues.zip

Question: Is there any research on how OFIQ quality scores can help in the detection of presentation attacks and morphs?

Answer: The benefit of OFIQ for morphing attack detection has been investigated in the work: Schlett et al. “Impact and Mitigation of Quality Degradation for Differential Morphing Attack Detection”, IWBF 2025. See:

https://ieeexplore.ieee.org/document/11113432