



FACE Automated face recognition

The requirements for civil security are quickly enhancing. Due to this fact, Fraunhofer IPK sets its research focus on biometric procedures for identity control and verification of documents which can be used for access control, border control or as protective mechanism for economic espionage. Now the human being with its individual, unchanging body characteristics is becoming the key to his / her personal data. Biometric features serve for identification and authentication.

Due to the strive for cost-effectiveness, reliability and correctness, automated security checks are becoming increasingly necessary. The logging of these automated procedures allows the comparison of safety inspections.

System description

The faces are captured live by an electronic camera. In a split second, a person can be identified or respectively the identity verified by comparing the captured characteristic face structures with an existent database of reference face images.

In order to examine the authenticity of documents / images Fraunhofer IPK developed in collaboration with partners, the "Verifier", a reading device which extracts the machine-readable attributes of a document and its biometric characteristics. The necessary biometric information may be contained in a photo, a barcode or a chip. After the extraction of biometric information, it will automatically be fed into the „Verifier“ and compared with the live picture of an installed camera or other reference data.

This way, for example border police could detect whether it is the authentic person of the presented passport or ID or the person presented a forged document.

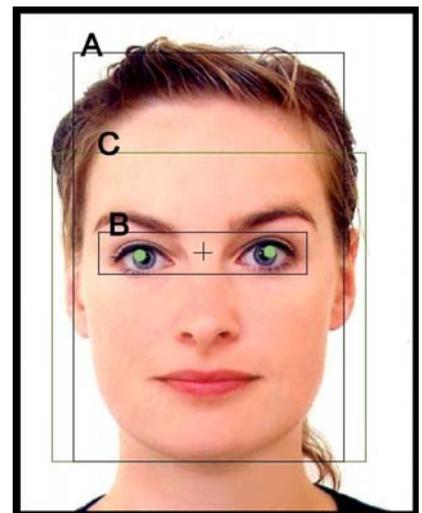


Image 1
The marked areas show the head area (A), the eye (B) and the face area (C).

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Besides a camera, the system requires only a computer on which the software is installed as well as commercially available hardware.

Performance characteristics

The evaluation of the positioning of distinctive anatomic face characteristics in the facial image is the core of possible applications of this module.

After the obligatory implementation of the biometric passport in Germany, the digital facial image requirements increased immensely. Besides others, criteria like the comparative position of the eyes and head area in the picture, posture of the head and physiognomy have to be taken into consideration now. With our module, the evaluation of facial images quality according to ICAO requirements can now be carried out automatically.

For border traffic in airports, the facial identification is a great tool for identity control. It can be applied contact-less and with only the help of a biometric sensor. Therefore, individuals could pass the border and simultaneously their identity can be verified. The system will check automatically every individual passing and will only react if something is at hand against the individual passing or captured data is not consistent with the document or data base data. In such a case, border control staff should check on the individual more closely. Besides being an efficient and secure system for the handling of border traffic, the system works fast and long queuing times are being avoided.

References

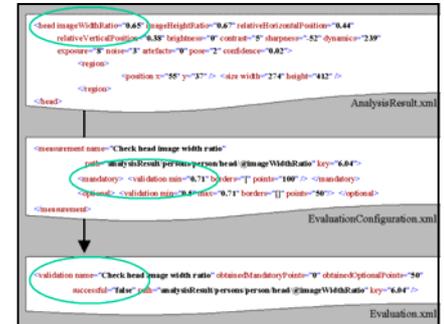
- successful application for the German E-passport,
- E-health insurance card,
- E-store card,
- E-staff card

Fields of application

- Module for an identity verification system for airport border control
- Evaluation of recording and portrait quality of digital images
- Access control and access monitoring
- Identity verification by means of simultaneous control of staff/ identity cards and biometric features

Our offer to you:

- Contact-free identity verification
- Ensuring of digital face images quality by means of checking with our Face module
- Ease of machine evaluation according to ISO-19794-5
- Provision of IPK software in the form of a Windows DLL,
- Checking of ICAO conformity of face images
- Easy adjustable positioning of detection areas
- Contact-free live capturing of biometric data
- Robust and able to abstract; changes like a beard, body weight, haircut, clothing can be disregarded



Identification of a quality problem during evaluation of Image 1

Individual evaluations are listed in **AnalysisResult.xml** (e.g. ratio face to facial image width should be 69%)

EvaluationConfiguration.xml describes the evaluation of image characteristics (e.g. ratio face to facial image width should be 71%)

In this case, the quality requirements are not fulfilled. This problem is recorded in **Evaluation.xml**.

Minor exceedance of reference values can be considered negligible. Since the system presents the user with the exact source of the problem (Evaluation.xml), the individual is able to assess the problem.