

Facial Identification and Related Definitions

Biometric Comparison

A process of comparing a biometric template with a previously stored template in the reference database in order to make an identification or verification decision.

Biometric Match

A determination that two samples correspond to the same source based on some level of computer-evaluated similarity. Does not inherently imply that the probe and candidate are the same person.

Class Characteristics

Characteristics common to many individuals (e.g., the overall shape of the nose, eyes, or mouth).

Cognitive Bias

(1) A mental error caused by one's simplified information processing strategies. It does not result from any emotional or intellectual predisposition toward a certain judgment, but rather from subconscious mental procedures for processing information. (2) A mental error that is consistent and predictable. (3) Influences that may affect the reliability and validity of one's observations and conclusions.

Confirmation Bias

Tendency to search for data or interpret information in a manner that supports one's preconceptions or prior beliefs.

Contextual Bias

The decision of a person is influenced by extraneous (often ambiguous) information that is not needed to draw a conclusion.

Controlled image

An image captured in accordance with facial identification or facial recognition standards or guidelines (e.g., passport photo, mugshot).

Face Perception

An individual's understanding and interpretation of the face, particularly the human face, especially in relation to the associated information processing in the brain.

Facial Identification (Facial Image Comparison)

The manual process by a human to evaluate similarities and dissimilarities between facial images or between a live subject and facial image(s) for the purpose of determining if they represent the same person or a different person.

Types of facial image comparison tasks:

Facial Assessment is a quick comparison of image-to-image or image-to-person, typically with controlled images, carried out in high throughput screening and access control applications or field operations. For example, at a border crossing or in a law enforcement setting (e.g., police traffic stop). Due to time constraints, assessment is the least rigorous of facial comparison tasks.

Facial Review is a comparison of image(s)-to-image(s) often used in either investigative or operational leads or in intelligence gathering applications. Review encompasses a broad range of purposes and levels of rigour, though by nature it is more rigorous than the assessment process. The task of facial review often includes the use of a 1:N or 1:Few facial recognition search. This task may also include escalations from facial assessment. A technical review or verification by at least one additional reviews should be conducted.

Facial Examination is a comparison of image(s)-to-image(s) often used in a forensic application. This task uses a rigorous morphological analysis, and includes a formal, systematic examination process (e.g., Analysis, Comparison, Evaluation - Verification [ACE-V]) for the purpose of effecting a conclusion. The examination and decision-making process is fully documented and included an independent technical review.

Facial Recognition

In Automated Systems

One-to-Many (1:N): The automated searching of a facial image in a biometric database, typically resulting in a group of facial images ranked by computer-evaluated similarity. (Is this person in the database-are they who they say they are?) E.g. Photo submitted with a passport application being checked against photos in an existing passport database.

A One-to-Few (1:Few): The automated search of a facial image against a subset of biometric templates. E.g. Watch lists, and or preapproved trusted travellers.

One-to-One (1:1) The automated authentication/verification through 1:1 matching. (Is this person who they claim to be?) E.g. Smart gate capturing a live image of the passenger and verifying against a template of the image stored on the e-passport).

By Humans

The mental process by which an observer identifies a person as being one they have seen before (familiar face) based on the recall of memories and information linked with that face.

Forensic Report

A document whose intent it is to provide information to assist a trier of fact (e.g. judge, immigration refugee board member).

Holistic Face Processing

The innate human ability of comparing faces by looking at the face as a whole without specifically considering the component parts in isolation.

Individual Characteristics

Characteristics allowing one to differentiate between individuals having the same class characteristics (e.g., freckles, moles, and scars).

Investigate Lead Report

A document whose intent is to provide information to operational personnel to assist them with meeting their objective.

Lights Out

An automated conclusion based upon threshold scores with no human involvement.

Morphological Analysis

A method of facial comparison in which the features and components of the face are compared. Conclusions in relation to similarity or difference are based on subjective assessment, evaluation, and interpretation of observations. Morphological analysis is based on the evaluation of the correspondence among facial features, components and their respective component characteristics (presence, shape, appearance, symmetry, location, relative proportion, etc.). This method in some form should be the primary approach used for facial comparison in all facial comparison tasks.

Perspective

Camera to subject geometry, including both camera to subject distance and orientation of the camera relative to the subject.

Perspective Distortion

Warping or transformation presented on an object's appearance in an image introduced by insufficient subject to camera distance (e.g., larger nose or smaller ears). Photographs made from a distance of less than two meters tend to introduce noticeable perspective distortion (e.g. selfie).

Resolution

The act, process, or capability of distinguishing between two separate but adjacent elements of detail in an image. Resolution normally has three components: spatial (e.g., pixels per inch), spectral (e.g., number of colors), and radiometric (e.g., number of shades).

Spoofing

In a biometric system, the process by which an imposter intentionally attempts to be recognized as another person or intentionally attempts to be missed as an existing identity in the gallery.

Uncontrolled image

An image not captured in accordance with standards or guidelines (e.g., a surveillance image, social media image).