

IMT 4126

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Standardised terms in biometrics

1. Always formulate your writing in compliance with ISO/IEC harmonized vocabulary.

- (a) 3 points What is the difference between a biometric characteristic and a biometric feature?

Answer: According to the ISO/IEC standard a biometric features are numbers or labels extracted from biometric samples which are used for comparison. And a biometric characteristic is a biological or behavioral characteristic of an individual from which distinguishing, repeatable biometric features can be extracted for the purpose of biometric recognition.

Or in layman's terms: A biometric characteristic can be something biological, like a finger, face or an eye, or some behavior like a persons gait pace or typing rhythm that we can extract biometric features from. Biometric features are labels or numbers that are extracted from a biometric sample like a fingerprint; ridges, delta structures, or for example the core, or lack thereof, which are used for comparison.

- (b) 3 points Before ISO/IEC standards on biometrics were established, the literature was using the term “*matcher*”. What is a better and ISO/IEC 2382-37 compliant term for the same concept?

Answer: The better term is “*compare*” or “*comparison*”. The “*match*” term was substituted with “*compare*” to make the message in sentences clearer, since researchers found the using the term “*match*” multiple times in the same sentence often led to contradictions and confusion. Thus in compliance with ISO/IEC 2382-37 the term “*compare*” means: Determination of whether the biometric probe(s) and biometric reference(s) have the same biometric source, based on a comparison score(s), a decision policy(ies) including a threshold, and possibly other inputs. And the term “*match*” refers to the value resulting from a comparison process.

Biometric Performance

2. You should be able to clarify, how we report the performance of biometric algorithms and systems.

- (a) 4 points Describe the difference between FNMR and FRR? What do you need to measure in order to determine the FRR of a system?

Answer: False Rejection Rate (FRR) is used as a metric for the verification process of a biometric system, while False Non-Match Rate (FNMR) is used as a metric for the decision subsystems. FRR gives a value for the biometric system falsely rejecting a presented identity, that is in fact registered in the system. FNMR is a metric for the proportions of the completed biometric mated comparisons trails that should have resulted in a match, but was returned as a non-match.

To measure the FRR we need to know the possible failures, and their proportions, that can happen in case of a false rejection. In a biometric system this would be the failure to capture (FTA) the presented characteristic and/or the failure to extract features (FTX) from the sample

if it was captured. These failures amounts to what is known as failure to acquire (FTA), which is calculated using the relationship between the FTC and FTX.

$$FTA = FTC + FTX * (1 - FTC)$$

This means that the we have to consider the cases of failure to acquire, cases in which we are accepted in the system, and when we are accepted but encounter a false non-match. This is represented in the following formula:

$$FRR = FTA + FNMR * (1 - FTA)$$

Biometric Face Capture Process

3. The face images collected in this practical are shared between the on-campus students for the purpose of solving the tasks for a future practical. The participation in the biometric capture process is on a voluntary basis.

- (a) 0 points I do understand the purpose of the face capture sessions and I agree that my face images are captured. Furthermore I confirm that I will remove the face images from other on-campus students as soon as I have completed the course.

Answer: I do not consent to sharing my image at this time. However I do confirm that I will remove the face images from other on-campus students as soon as I have completed the course.