TÉCNICO LISBOA

Learning-based Multimedia Processing

2022/2023

IST number: _____

Name: _____

Quiz #2 **Duration: 20 minutes**

Provide clear, legible, and succinct answers.
Always justify your assumptions.

Questions

1. To control the access to a critical system an organization may use one of the following solutions:

a) Token based PIN
b) Iris Scan
c) Identification card with photo
d) Password

Discuss the relative merits of these options, indicating the one you believe is the most effective.

2. What is understood by biometric verification?

Indicate two metrics (explaining what they measure) which can be used for performance evaluation of a biometric verification system.

3. An organization is considering implementing biometric access control for a critical system. The organization should be MOST concerned with which of the following? (Justify your answer)

a) False Match Rate (FMR)
b) False Non-Match Rate (FNMR)
c) Equal Error Rate (EER)
d) Number of staff enrolled for biometrics.

4. Fusion of information captured from multiple biometric traits often improves biometric recognition results. Give one example to illustrate the types of information that can be considered for fusion, and an example of how the fusion of those biometric traits can be done.

5. Is a biometric template always created from a single biometric sample of a given person? Why?

Solution:

1 –

Iris scan – more reliable; very difficult to bypass.
A password can be shared; a token can be borrowed; an ID card can be borrowed by someone that modifies its look to be sufficiently similar to the photo.

2 –

Biometric verification corresponds to a 1:1 matching against a claimed identity;
Possible metrics: FNMR, ROC curve

3 –

False Match Rate (FMR), which is related to False-Acceptance Rate (FAR) - $FAR=FMR\times(1-FTA)$
FMR is the rate of acceptance of unauthorised persons. A low FMR is essential when controlling access to highly sensitive data/facilities. EER could be used as an indicator of overall performance.

4 –

voice and face;
sensor-level; feature-level; decision-level; score-level

5 –

No, considering multiple samples acquired in different conditions will make the person's template more representative