Fingerprint Biometrics Lab - Report

APRENDIZAJE PROFUNDO PARA PROCESAMIENTO DE INFORMACIÓN BIOMÉTRICA

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Exercise 1

a) *Copy here the two fingerprint images provided as examples (`example1_1` and `example1_2`).*

(a) Example1_1 (b) Example1_2

Figure 1: Original fingerprints

b) *How many macro-singularities do you observe in each fingerprint?*

We can see that there is only one macro-singularity in each fingerprint. Specifically, we observe a **loop** in each one of them.

c) *Mark the macro-singularities in the images (deltas and loops).*

1 Exercise 2

a) *Execute the provided code for Fingerprint Enhancement and paste the resulting image here:*

b) *What differences do you observe with respect to the original fingerprints?*

Conseguimos continuidad en las crestas papilares.

2 Exercise 3

a) *Execute now the code for Quality Maps, and past the resulting quality maps:*

b) *What is the range of values for these quality maps?*

c) *What kind information (apart from the quality) can be inferred from such code?*

3 Exercise 4

Execute the code in order to show the Binarized Fingerprint and the Segmented Fingerprint. Apply different values of quality threshold (0.1, 0.3, 0.6, 0.9) and paste here the resulting images:

4 Exercise 5

a) *Execute the code for generating the Fingerprint Skeleton and the Minutiae Extractor. Paste the resulting images for the original values window=5 and margin=5.*

b) *Search heuristically by looking at the images for the optimal values of parameters window and margin. Paste the resulting images with your optimal parameters and justify your decision.*

5 Exercise 6

a) *Execute the code corresponding to the Minutiae Validation for window=5 and margin=5. Paste the resulting image including the minutiae extracted (red crosses) and validated (blue circles) of both fingerprints.*

b) *Execute the same code but with the optimal values of parameters window and margin. Paste the resulting image below.*

c) *Do you think it is a good idea to include the Minutiae Validation module? Justify your opinion.*

6 Extra Exercise

In folder `/ddbb` *you have 20 fingerprint images. 19 of them are labeled with the subject identity (e.g., H0001), and 1 is Unknown. Search for the identity of the Unknown fingerprint in the set of 19 labelled reference fingerprints. You can use the provided code* `identification_1_19.m` *as basis. Paste here the resulting ranked list of scores of the Unknown fingerprint with respect each one of the 19 reference fingerprints.*