

Fingerprint Biometrics Lab - Report

APRENDIZAJE PROFUNDO PARA PROCESAMIENTO DE INFORMACIÓN BIOMÉTRICA

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1. Exercise 1

- a) *Copy here the two fingerprint images provided as examples (example1_1 and example1_2).*
- b) *How many macro-singularities do you observe in each fingerprint?*
- c) *Mark the macro-singularities in the images (deltas and loops).*

2. 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?*

3. 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?*

4. 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:

5. 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.*

6. 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.*

0.2



(a)

b

Figura 1: Example1_1

0.2



(a)

b

Figura 2: Example1_2

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.

7. Extra Exercise

In folder `/ddb` 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.mas` as basis. Paste here the resulting ranked list of scores of the Unknown fingerprint with respect each one of the 19 reference fingerprints.