Regular Track: Assignment #3

Image Based Biometry 2021/22
Faculty of Computer and Information Science
University of Ljubljana

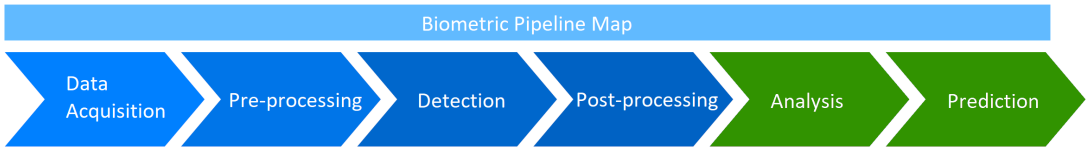
Recognition

Biometric pipeline coarsely consists of: data acquisition, pre-processing, detection, feature acquisition and decision making as visualized in Figure 1. For this assignment you are going to tackle the last two steps, using either the output of your previous assignment or your own dataset.

After completing this assignment you will have addressed a typical biometric pipeline from start to finish, which is quite an achievement!

Please, visit lab sessions in order to get all the information needed for this assignment. Download the base Python evaluation code available from Eučilnica which will, in conjuction with lab sessions provide you with the material needed for this assignment.

Figure 1. Biometric recognition pipeline.



I. Task Overview

1) Data:
   - Use the output from your previous assignment (store predicted regions as images and use those for your model),
   - OR use the already cropped dataset attached to the package,
   - OR use a dataset of your choosing.
2) Classification consisting of two main steps:
   - Feature extraction/analysis,
   - prediction (identification/verification).

However, if you will be using CNNs these two steps are addressed jointly (if you set it as a closed-set problem – more on this during lab sessions).

A. Traditional (Hand-crafted) Approaches

If you decide to tackle this task in a more traditional way, hand-crafted approaches are the way to go. There are multiple options on how to address this:

- You implement your own feature extractor (you got familiar with one of those during lectures already – LBP; we are going to tackle this during the lab sessions this week),
- OR use available ones and modify them (visit lab sessions to see how),

When you have your features (vectors) computer for each image, measure similarity between them, sort them according to distance and compute measures that we have covered. If you have questions on how to do that, please, visit lab sessions.

B. Deep-learning-based Approaches

Similar to the previous task (detection) perhaps the most straight-forward, and the most SOTA-like approach, would be a CNN-based one.

There are again multiple options; similar to the detection task, the safest bet is to start with some existing network and go from there. More on this during lab sessions.

II. Grading

The maximum amount of points you can get is 100. The grading will be the following:

1) Using prediction from your previous assignment, if possible: up to 10 pts.
2) Recognition: up to 70 pts:
   - Either CNN-based approaches,
   - OR multiple feature extractors + distance measure.
3) Evaluation: up to 10 pts (preparation of plots, identification/verification experiments etc.).
4) Additional: up to 10 pts – reserved for things like outstanding performance, preparation of datasets, etc.

The grading will follow the rules above. However, notice that there could be some deviation based on the estimated amount of work you invested.

After the meeting feel free to improve your grade through the rebuttal.

If you have any questions or issues do not hesitate to contact Žiga (ziga.emersic@fri.uni-lj.si) and visit lab sessions.