

BIOMETRICS

Fall 2006

Homework 3: Hand Geometry Classification

Due: November 7, 2006



Figure 1: Hand Geometry Recognition

Lab Description:

In this lab you will attempt to recognize a person from their hand geometry. To do this you will be given 100 total outlines taken from 10 hands. Fifty of the outlines will be labeled, five for each hand. fifty of the outlines will be unlabeled. Your job will be to extract the features, train two different classifiers using the labeled samples, and then recognize the 50 remaining unlabeled samples.

Where to get the Outlines:

The outlines will be posted to the course website.

What to Program:

You should first decide on which features of the hand you want to use for classification. You must use a minimum of 4 features, though you may use more. The same features must be extracted from each image. While you could write code to extract your features you can also do this manually, using for example a ruler and entering the features manually.

You will then create two classifiers, which take these features as input. One classifier should be probabilistic in the sense that you compute some sort of statistic from the enrollment data. The other could be whatever you want (e.g.,k-th nearest neighbor).

You should then train your classifiers and perform recognition on the test set. The output should be a table where the first column is the image number (as written on the image) and the second column contains the recognition result.

You can use whatever language you like.

What to Hand In:

Students must hand in the following:

1. A description of the experimentation done, including the logic behind your choice of features and classifiers.
2. A printout where the first column contains the outline number (51—100) and the second column contains the ID. If you implement this in Matlab, it would be appreciated if you saved the results as a .mat file so that the results can be automatically evaluated.