

# EXPERIMENT 01

## DESCRIPTION:

In summary, we need to do the following

1. Compute the Eigenspace (Training) built from all databases (**AR+FERET**), i.e. eigenspace from 400 randomly selected images (200 from **AR** + [200 from **FERET B** 70 from **fa** + 70 from **fb** + 60 from **dup1**]).

**Files associated with eigenspace:** PCs.mat, EVs.mat, PCfiles.mat, data\_mean.mat.

**No files to use (already done).**

2. Fine tuning of GA-based gender feature selection on AR database, i.e. fine-tune GA using a gallery set from AR (images 1-7 from every subject) and a validation set from AR (images 14-20 from every subject).

Files to use	
Gallery	Validation
AR_proj_gal_data.mat	AR_proj_val_data.mat
AR_proj_gal_files.mat	AR_proj_val_files.mat

3. Evaluate impact of different conditions on face recognition performance by testing probes fb, dup1 and dup2 against gallery fa. Specifically, try the following setting:

Gallery	Probe	Files to use	
		Gallery	Probe
fa	fb	fa_proj.mat	fb_proj.mat
		fa_files.mat	fb_files.mat
fa	dup1	fa_proj.mat	dup1_proj.mat
		fa_files.mat	dup1_files.mat
fa	dup2	fa_proj.mat	dup2_proj.mat
		fa_files.mat	dup2_files.mat

**NOTE:** All \* files.mat MAT-files (lists of filenames) can be used for extracting the IDs for each partition set. The IDs are shown in the first 5 letters of the filename for both the AR and FERET databases.

Code used for generation of MAT-files (above): FCRtk package (Face Categorization & Recognition ToolKit)

## CONTENTS DESCRIPTION

Location (Folder)	File	Description
Original Data		All images in the MAT-files in this folder are normalized in terms of translation and rotation, and cropped to a 60×85 (width×height) resolution (in pixels). Each MAT-file contains a M×N matrix (N samples, M features).
	AR.mat	The <b>AR</b> face database before projection.
	fa.mat	The <b>fa</b> partition of the <b>FERET</b> database before projection (regular frontal image).
	fb.mat	The <b>fb</b> partition of the <b>FERET</b> database before projection (alternative frontal image, taken shortly after the corresponding fa image).
	dup1.mat	The <b>dup1</b> partition of the <b>FERET</b> database before projection ('dup1', consists of all other frontals of the subjects. Most were captured at later sessions, although some are images of the subjects at the earliest session but with glasses and/or an alternate hairstyle. The 'dup1' probe set size is 702 images).
	dup2.mat	The <b>dup2</b> partition of the <b>FERET</b> database before projection ('dup2' probe set is a subset of the 'dup1' probe set consisting of all frontals captured at least 540 days after the subject's allery image. The 'dup2' probe set size is 223 images).
Eigenspace		This folder contains all the files related to the computation of the eigenvectors and eigenvalues which is based on 400 randomly selected images from both AR and FERET (i.e. 200 from AR and 200 from fa+fb).
	PCs.mat	Principal Components (eigenvectors).
	EVs.mat	Eigenvalues
Training Data		
	PCfiles.mat	The list of filenames of the samples used for computing the eigenspace.
	data_mean.mat	The mean vector of the training data.
GA		This folder contains the gallery and validation datasets (projections) that are used for fine tuning the GA.
\AR\Gallery	AR_proj_gal_data.mat	The gallery set of the projected <b>AR</b> database (images 1-7 from every subject) used for fine tuning.
	AR_proj_gal_labels.mat	The labels for the gallery set.
	AR_proj_gal_files.mat	The filenames of the AR images in the gallery set.
\AR\Validation	AR_proj_val_data.mat	The subset of the projected AR database (images 14-20 from every subject) that will be used for validation during fine tuning of the GAs.
	AR_proj_val_labels.mat	The labels for the validation set.
	AR_proj_val_files.mat	The filenames of the AR images in the validation set.
Testing		This folder contains all the necessary files for the matching/testing stage of the experiment.
\FERET\Gallery	fa_proj.mat	The fa database after projection to the eigenspace.
	fa_labels.mat	The labels of the projected fa database.
	fa_files.mat	The filenames of the images included in the fa database.
\FERET\Probe\fb	fb_proj.mat	The fb database after projection to the eigenspace.
	fb_labels.mat	The labels of the projected fb database.
	fb_files.mat	The filenames of the images included in the fb database.
\FERET\Probe\dup1	dup1_proj.mat	The dup1 database after projection to the eigenspace.
	dup1_labels.mat	The labels of the projected dup1 database.
	dup1_files.mat	The filenames of the images included in the dup1 database.
\FERET\Probe\dup2	dup2_proj.mat	The dup2 database after projection to the eigenspace.
	dup2_labels.mat	The labels of the projected dup2 database.
	dup2_files.mat	The filenames of the images included in the dup2 database.

**NOTE:** The \*\_files.mat files can be used for extracting the subjects' IDs.

The \*\_labels.mat files contain the labels of Male and Female classes (i.e. 1 and 2 respectively).