

EXPERIMENT 02

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 FERET database, i.e. fine-tune GA using a gallery set from FERET (fa frontal poses partition) and a validation set from FERET (fb frontal poses partition).

Files to use	
Gallery	Validation
fa_proj_gal_data.mat	fb_proj_val_data.mat
fa_proj_gal_files.mat	fb_proj_val_files.mat

3. Evaluate impact of different conditions on face recognition performance by testing probes AR_fe (facial expressions), AR_light (lighting), AR_sg (sunglasses) and AR_occl (occlusions) against gallery AR1_14 (regular frontal poses: images 1 and 14 from each subject). Specifically, try the following setting:

Gallery	Probe	Files to use	
		Gallery	Probe
AR1_14	AR Facial Expressions	AR1_14_proj.mat	AR_fe_proj.mat
		AR1_14_files.mat	AR_fe_files.mat
AR1_14	AR Lighting	AR1_14_proj.mat	AR_light_proj.mat
		AR1_14_files.mat	AR_light_files.mat
AR1_14	AR Sun Glasses	AR1_14_proj.mat	AR_sg_proj.mat
		AR1_14_files.mat	AR_sg_files.mat
AR1_14	AR Occlusions	AR1_14_proj.mat	AR_occl_proj.mat
		AR1_14_files.mat	AR_occl_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 AR face database before projection.
	fa.mat	The fa partition of the FERET database before projection (regular frontal image).
	fb.mat	The fb partition of the FERET database before projection (alternative frontal image, taken shortly after the corresponding fa image).
	dup1.mat	The dup1 partition of the FERET 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 dup2 partition of the FERET 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 allergy 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.
\FERET\Gallery	fa_proj_gal_data.mat	The projected fa database used as gallery for fine tuning.
	fa_proj_gal_labels.mat	The labels for the gallery set.
	fa_proj_gal_files.mat	The filenames of the AR images in the gallery set.
\FERET\Validation	fb_proj_val_data.mat	The projected fb database used as validation for fine tuning.
	fb_proj_val_labels.mat	The labels for the validation set.
	fb_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.
\AR \Gallery	AR1_14_proj.mat	The AR database subset (poses 1 & 14 from each subject) after projection to the eigenspace that is used as gallery in the testing stage of the experiment.
	AR1_14_labels.mat	The labels of the test gallery.
	AR1_14_files.mat	The filenames of the images included in the test gallery.
\AR\Probe\fe	AR_fe_proj.mat	The AR database subset (poses 2-4 & 15-17 from each subject) after projection to the eigenspace that is used as probe in the testing stage of the experiment for facial expression evaluation.
	AR_fe_labels.mat	The labels of the facial expressions test probe.
	AR_fe_files.mat	The filenames of the images included in the facial expressions test gallery.
\AR \Probe\light	AR_light_proj.mat	The AR database subset (poses 5-7 & 18-20 from each subject) after projection to the eigenspace that is used as probe in the testing stage of the experiment for lighting evaluation.
	AR_light_labels.mat	The labels of the lighting test probe.
	AR_light_files.mat	The filenames of the images included in the lighting test gallery.
\AR \Probe\sg	AR_sg_proj.mat	The AR database subset (poses 8-10 & 21-23 from each subject) after projection to the eigenspace that is used as probe in the testing stage of the experiment for sunglasses evaluation.
	AR_sg_labels.mat	The labels of the sunglasses test probe.
	AR_sg_files.mat	The filenames of the images included in the sunglasses test gallery.
\AR \Probe\occl	AR_occl_proj.mat	The AR database subset (poses 11-13 & 24-26 from each subject) after projection to the eigenspace that is used as probe in the testing stage of the experiment for occlusions evaluation.
	AR_occl_labels.mat	The labels of the occlusions test probe.
	AR_occl_files.mat	The filenames of the images included in the occlusions test gallery.

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).