

3 Facial Recognition

- The AR Database (created by Aleix Martinez and Robert Benavente in the Computer Vision Center at the Universitat Autònoma de Barcelona) contains over 4000 facial images of 126 different people with different illumination conditions, facial expression, and occlusions.
 - Learning Objective: be able to automatically read in directory/location of files of interest, read the files, image processing and feature extraction, and employ one or more classification algorithm, conduct monte carlo simulations to assess performance variability, and summarize the results
 - Target Audience: undergraduates, graduate students
 - Techniques: using R's input/output abilities, image processing, classification
- (a) Contact Dr. Aleix Martinez (aleix@ece.osu.edu) and obtain permission to download the collection. Decompress the files and put them in corresponding folders.
- (b) Write a function (potentially a suit of functions) which will automatically access the directories and their files. For each image
- Open the RAW file (768*576 RGB, or used converted TIFF/JPEG files)
 - Apply normalization and segmentation procedures
 - Extract a feature vector
 - Store the feature vector and the associated metadata in a structure or list format
- (c) Apply one or more classification methods and a monte carlo simulation to assess performance variation. Summarize your output with a confusion matrix.