Kin Recognition Using Weighted Graph Embeddings

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Recap: Problem Statement and Solution

Given two images of people's faces, we want to be able to say how the people in the pictures they are related. For example, given the following pair of images:

We want to be able to tell that they are mother and daughter. To do this, we are implementing the paper "Weighted Graph Embedding-Based Metric Learning for Kinship Verification" and verifying their results.

What's Been Accomplished

We are exactly on schedule as the basic experimental settings have been implemented:

- **Face Detection**: The ability to detect faces and save them as 64×64 images
- **LBP**: A 3776-dimensional vector for each face using Local Binary Patterns
- **HOG**: A 2880-dimensional vector is obtained based off of Histogram of Gradients
- **SIFT-variant**: A 6272-dimensional vector is obtained
- **VGG**: Using the VGG architecture and weights from Oxford's Visual Geometry Group, obtains the 4096-dimensional feature vector.

Metrics - Unit Test Coverage

Name	Stmts	Miss	Cover	Missing
src/face_descriptors/HOG.py	47	0	100%	
src/face_descriptors/LBP.py	45	0	100%	
src/face_descriptors/SIFT.py	151	10	93%	151-162, 166, 201
src/face_descriptors/VGG.py	79	6	92%	148, 166-170
src/face_recognition/face_detection.py	16	4	75%	50, 63-65, 75
TOTAL	338	20	94%	

Core Functionality Left

- Main Algorithm of the Paper
  - There are 2 different algorithms used, WGEML and a kernelized version. For now, we will only look at the base algorithm as those are the results they put in the paper
- Do the experiments with WGEML and the corresponding vectors of each face in the dataset
- Experiment with SIFT and HOG vectors
  - SIFT uses keypoints but the paper does it differently
  - HOG requires normalization of the vectors in a specific way which the paper doesn't mention doing