**EigenFace**

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**Description:**

Implement EigenFace and apply it on att\_faces data set, which contains 400 face images of 40 people. 280 of them are set as training and the rest of them are set as testing.

**Result:**

eigenVectors: 40 10304

convert images to feature vectors...

Matching...

real label: 1 predicted label: 1 distance: 12.1918

real label: 1 predicted label: 1 distance: 10.432

real label: 1 predicted label: 1 distance: 10.5819

real label: 2 predicted label: 2 distance: 2.40525

real label: 2 predicted label: 2 distance: 6.57612

real label: 2 predicted label: 2 distance: 3.97464

real label: 3 predicted label: 3 distance: 3.15635

real label: 3 predicted label: 3 distance: 7.07647

real label: 3 predicted label: 3 distance: 6.16451

real label: 4 predicted label: 4 distance: 2.65069

real label: 4 predicted label: 4 distance: 3.19919

real label: 4 predicted label: 4 distance: 5.45377

real label: 5 predicted label: 5 distance: 7.20316

real label: 5 predicted label: 5 distance: 6.03769

real label: 5 predicted label: 40 distance: 6.88576

real label: 6 predicted label: 6 distance: 4.27129

real label: 6 predicted label: 6 distance: 5.50219

real label: 6 predicted label: 6 distance: 2.14154

real label: 7 predicted label: 7 distance: 4.3957

real label: 7 predicted label: 7 distance: 3.56415

real label: 7 predicted label: 7 distance: 5.26365

real label: 8 predicted label: 8 distance: 3.74006

real label: 8 predicted label: 8 distance: 6.94684

real label: 8 predicted label: 8 distance: 4.81941

real label: 9 predicted label: 9 distance: 5.89208

real label: 9 predicted label: 9 distance: 5.79973

real label: 9 predicted label: 9 distance: 5.97745

real label: 10 predicted label: 10 distance: 6.09399

real label: 10 predicted label: 10 distance: 10.8449

real label: 10 predicted label: 38 distance: 11.2348

real label: 11 predicted label: 11 distance: 5.96445

real label: 11 predicted label: 11 distance: 6.31401

real label: 11 predicted label: 11 distance: 5.0495

real label: 12 predicted label: 12 distance: 6.13916

real label: 12 predicted label: 12 distance: 7.67866

real label: 12 predicted label: 12 distance: 7.25529

real label: 13 predicted label: 13 distance: 1.33499

real label: 13 predicted label: 13 distance: 5.51252

real label: 13 predicted label: 13 distance: 1.95853

real label: 14 predicted label: 14 distance: 4.52593

real label: 14 predicted label: 14 distance: 6.35373

real label: 14 predicted label: 14 distance: 8.39078

real label: 15 predicted label: 15 distance: 7.20904

real label: 15 predicted label: 15 distance: 3.1526

real label: 15 predicted label: 15 distance: 3.15913

real label: 16 predicted label: 16 distance: 10.5315

real label: 16 predicted label: 16 distance: 8.83227

real label: 16 predicted label: 16 distance: 6.66347

real label: 17 predicted label: 17 distance: 6.26818

real label: 17 predicted label: 17 distance: 4.24821

real label: 17 predicted label: 17 distance: 3.77059

real label: 18 predicted label: 18 distance: 4.07614

real label: 18 predicted label: 18 distance: 4.57468

real label: 18 predicted label: 18 distance: 6.00655

real label: 19 predicted label: 19 distance: 6.71548

real label: 19 predicted label: 11 distance: 11.4164

real label: 19 predicted label: 19 distance: 5.01018

real label: 20 predicted label: 20 distance: 7.51666

real label: 20 predicted label: 20 distance: 5.96926

real label: 20 predicted label: 20 distance: 3.72769

real label: 21 predicted label: 21 distance: 5.84553

real label: 21 predicted label: 21 distance: 3.80463

real label: 21 predicted label: 21 distance: 4.74697

real label: 22 predicted label: 22 distance: 3.15796

real label: 22 predicted label: 22 distance: 3.13103

real label: 22 predicted label: 22 distance: 3.44837

real label: 23 predicted label: 23 distance: 2.88688

real label: 23 predicted label: 38 distance: 6.88307

real label: 23 predicted label: 23 distance: 4.26018

real label: 24 predicted label: 24 distance: 4.03075

real label: 24 predicted label: 24 distance: 6.72624

real label: 24 predicted label: 24 distance: 6.09344

real label: 25 predicted label: 25 distance: 6.47854

real label: 25 predicted label: 25 distance: 4.41752

real label: 25 predicted label: 25 distance: 3.97678

real label: 26 predicted label: 26 distance: 5.32992

real label: 26 predicted label: 26 distance: 4.35731

real label: 26 predicted label: 26 distance: 5.8058

real label: 27 predicted label: 27 distance: 3.64548

real label: 27 predicted label: 27 distance: 5.3387

real label: 27 predicted label: 27 distance: 5.48915

real label: 28 predicted label: 37 distance: 7.72725

real label: 28 predicted label: 28 distance: 8.40941

real label: 28 predicted label: 28 distance: 6.60681

real label: 29 predicted label: 29 distance: 5.91097

real label: 29 predicted label: 29 distance: 6.2474

real label: 29 predicted label: 29 distance: 5.59287

real label: 30 predicted label: 30 distance: 4.58986

real label: 30 predicted label: 30 distance: 4.83648

real label: 30 predicted label: 30 distance: 3.83912

real label: 31 predicted label: 31 distance: 3.84088

real label: 31 predicted label: 31 distance: 5.07823

real label: 31 predicted label: 31 distance: 4.58552

real label: 32 predicted label: 32 distance: 7.24838

real label: 32 predicted label: 32 distance: 5.5445

real label: 32 predicted label: 32 distance: 4.12246

real label: 33 predicted label: 33 distance: 7.86354

real label: 33 predicted label: 33 distance: 4.31062

real label: 33 predicted label: 33 distance: 1.21694

real label: 34 predicted label: 34 distance: 2.68441

real label: 34 predicted label: 34 distance: 4.54946

real label: 34 predicted label: 34 distance: 4.59253

real label: 35 predicted label: 35 distance: 5.32303

real label: 35 predicted label: 35 distance: 7.84739

real label: 35 predicted label: 35 distance: 8.18124

real label: 36 predicted label: 36 distance: 3.65559

real label: 36 predicted label: 36 distance: 7.40615

real label: 36 predicted label: 36 distance: 8.58598

real label: 37 predicted label: 37 distance: 5.06373

real label: 37 predicted label: 37 distance: 2.67578

real label: 37 predicted label: 37 distance: 5.11899

real label: 38 predicted label: 38 distance: 7.36874

real label: 38 predicted label: 38 distance: 5.82913

real label: 38 predicted label: 38 distance: 3.40159

real label: 39 predicted label: 39 distance: 3.33881

real label: 39 predicted label: 39 distance: 5.19194

real label: 39 predicted label: 39 distance: 5.83115

real label: 40 predicted label: 40 distance: 5.12252

real label: 40 predicted label: 40 distance: 7.09501

real label: 40 predicted label: 40 distance: 5.86339

**Total number of test cases: 120**

**# correct: 115 accuracy: 0.958333**

**Other:**

**Compile it with OpenCV3**

**Use release mode to boost the program**