

# Face Detection and Recognition

**Group Number: 25**

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# Introduction

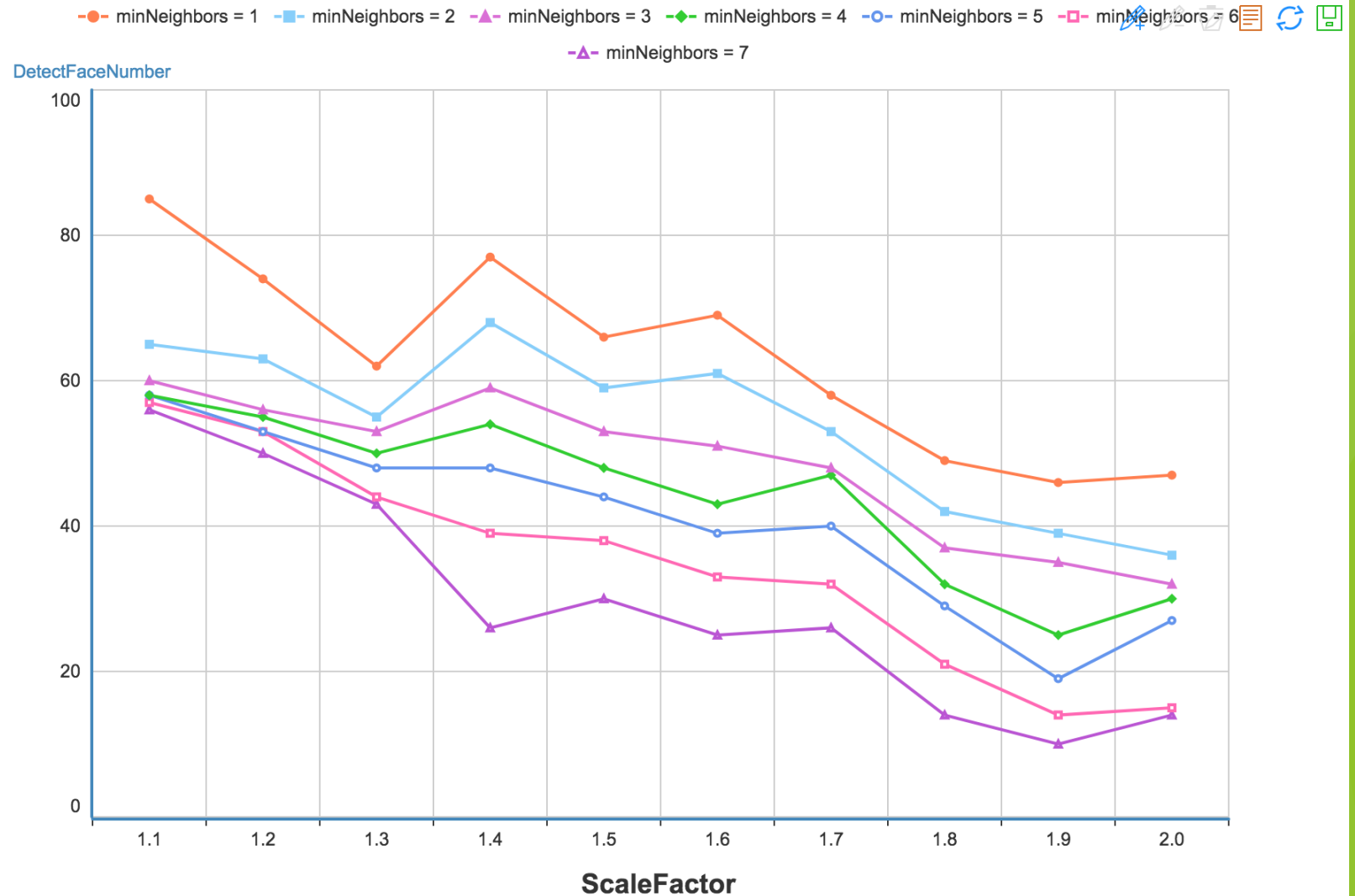
- ▶ Application in numerous fields<sup>[1]</sup>
  - ▶ Security: recognizing fraud detection
  - ▶ Marketing: recognizing customers as they enter (such as the Facedeals APP)
  - ▶ Digital make-up: recognizing face and applying digital make-up
  - ▶ ...
- ▶ Our project:
  - ▶ Detect faces in class photos
  - ▶ Recognize detected faces

# Pre-Process Dataset

- ▶ Resized all training images to 1024\*720
- ▶ Unified names of training images: format is face\_01\_uid
  - ▶ No uid
  - ▶ Different name, such as yqs1.jpg, IMG\_201802281.jpg
  - ▶ Upper 'U' to lower 'u'

# Face Detection<sup>[2]</sup>

- ▶ Algorithms (OpenCV):
  - ▶ Haar Cascade Classifier
  - ▶ LBP Cascade Classifier
- ▶ Accuracy:  $58/72 = 81\%$
- ▶ Compare Parameter:
  - ▶ Minimum neighbors
  - ▶ Scale factor



# Face Recognition<sup>[3, 4]</sup>

- ▶ 58 faces are detected (in IMG\_1820.JPG)
- ▶ Faces are resized to 150\*150
- ▶ Performance of different algorithms:

Algorithm	Correctly recognized faces	Consumed time (including detection)
Local Binary Patterns Histograms (LBPH)	4	< 1 minute
EigenFaces	6	< 1 minute
FisherFaces	7	< 1 minute
ResNet	30	> 2 minutes originally. But < 20 seconds after our improvement (i.e. caching face encodings)

# Result



Click [here](#) to view the result in browser

# References

- ▶ [1] K. Sennaar, "Facial Recognition Applications - Security, Retail, and Beyond", TechEmergence, 2018.
- ▶ [2] R. Raja, "Face Detection using OpenCV and Python.", SuperDataScience - Big Data | Analytics Careers | Mentors | Success, 2017.
- ▶ [3] R. Raja, "Face Recognition using OpenCV and Python.", SuperDataScience - Big Data | Analytics Careers | Mentors | Success, 2017.
- ▶ [4] "Welcome to Face Recognition's documentation! — Face Recognition 1.2.2 documentation", Face-recognition.readthedocs.io, 2017. [Online]. Available: <https://face-recognition.readthedocs.io/en/latest/index.html>.
- ▶ [5] "Jupyter Notebook Viewer", Nbviewer.jupyter.org, 2018. [Online]. Available: [http://nbviewer.jupyter.org/github/krasserm/face-recognition/blob/master/face-recognition.ipynb?flush\\_cache=true](http://nbviewer.jupyter.org/github/krasserm/face-recognition/blob/master/face-recognition.ipynb?flush_cache=true).
- ▶ [6] He, K., Zhang, X., Ren, S., Sun, J. (2016). Deep residual learning for image recognition. In Proceedings of the IEEE conference on computer vision and pattern recognition (pp. 770-778).