Face Recognition and Detection

COE 485

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OpenCV

- **C**omputer **V**ision Library for Python
- Haar Cascades (native) > Classify
- Face Recognizers (contribution)
  - Local Binary Patterns Histograms (LBPH)
  - EigenFaces
  - **Fisher Recognizer (Chosen)**

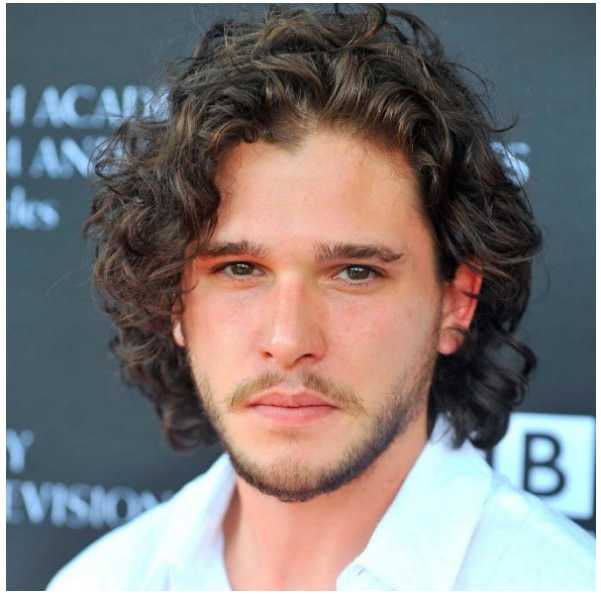
How to make a computer identify a person's face?

- Get many pictures of the same person.
- **Detect** where a face is in each pictures.
- **Train** against the detected faces.
- **Predict** a detected face from a new picture for that person.

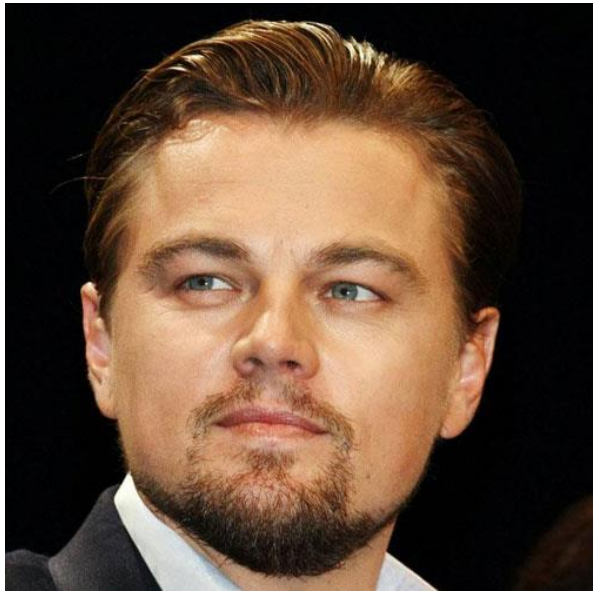
People in Testing

1. Brody

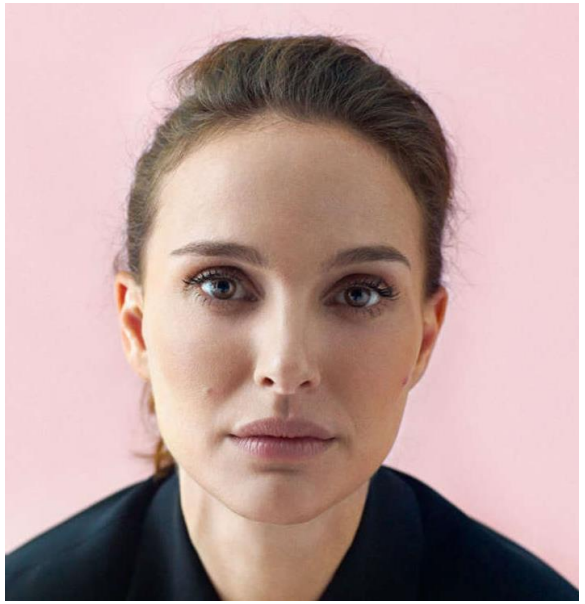
2. Clarke



3. Kit



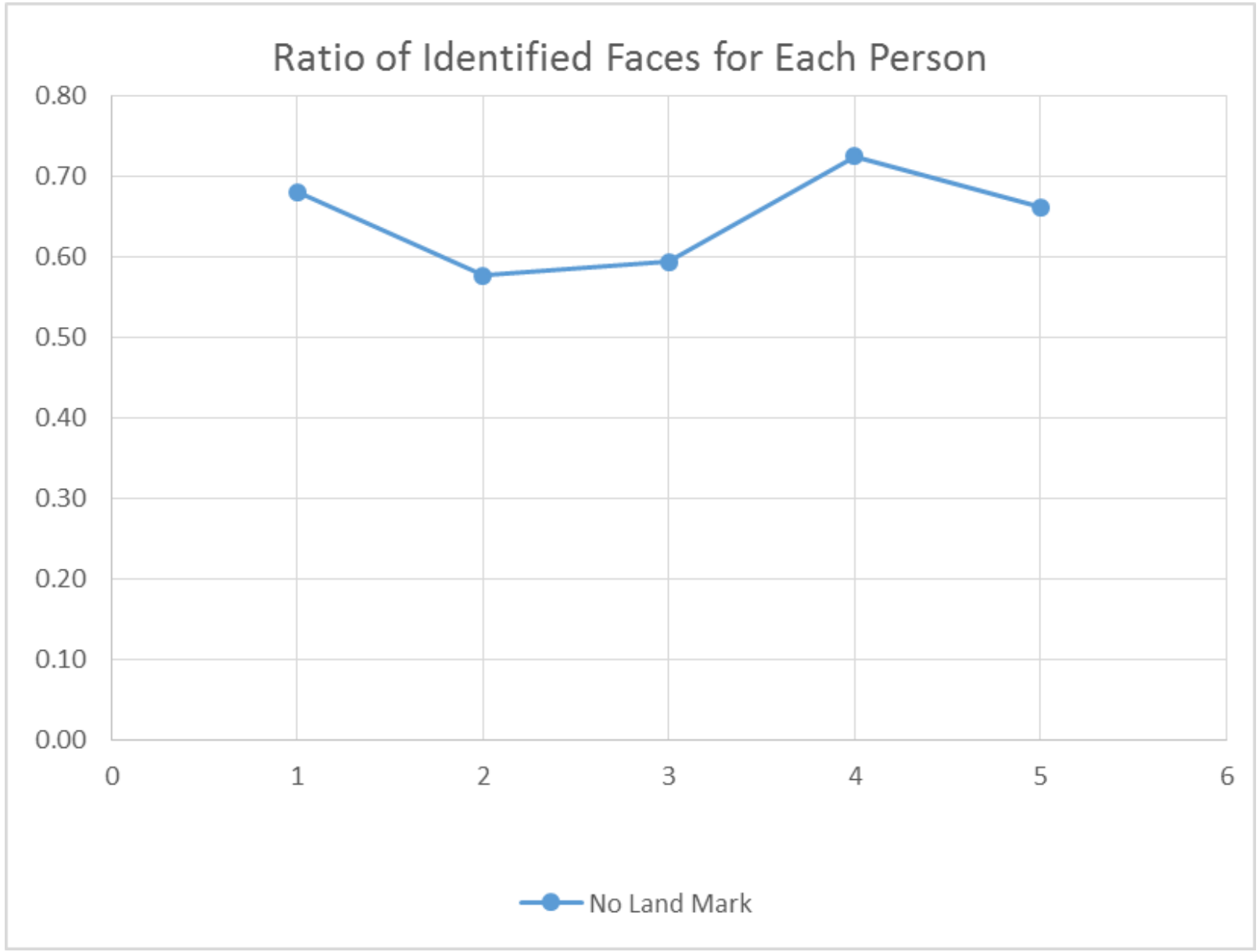
4. Leo



5. Natalie

Average Ratio of Identification:

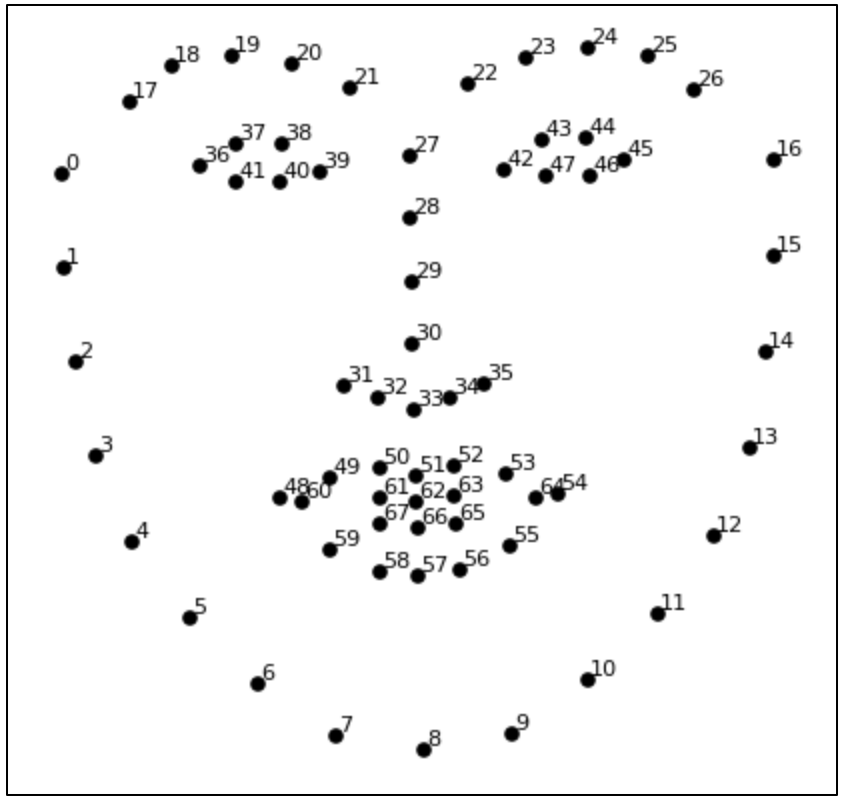
65%



Faces Are Not Aligned

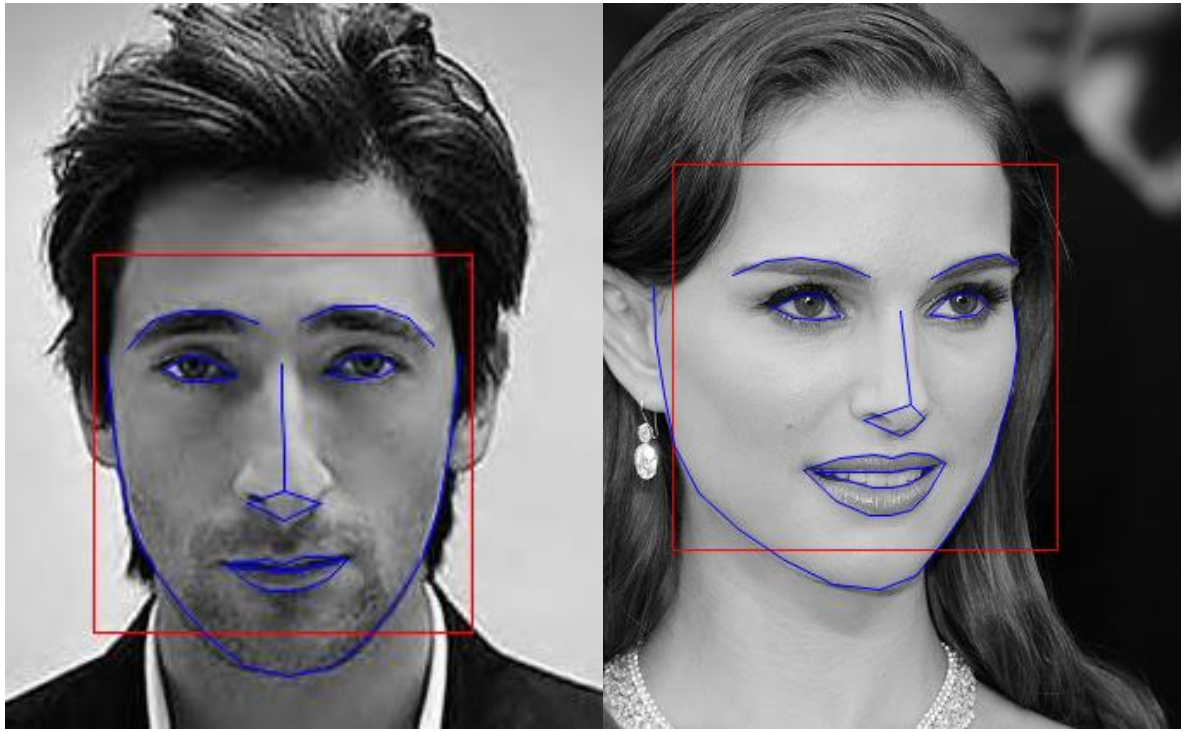
Dlib & OpenFace

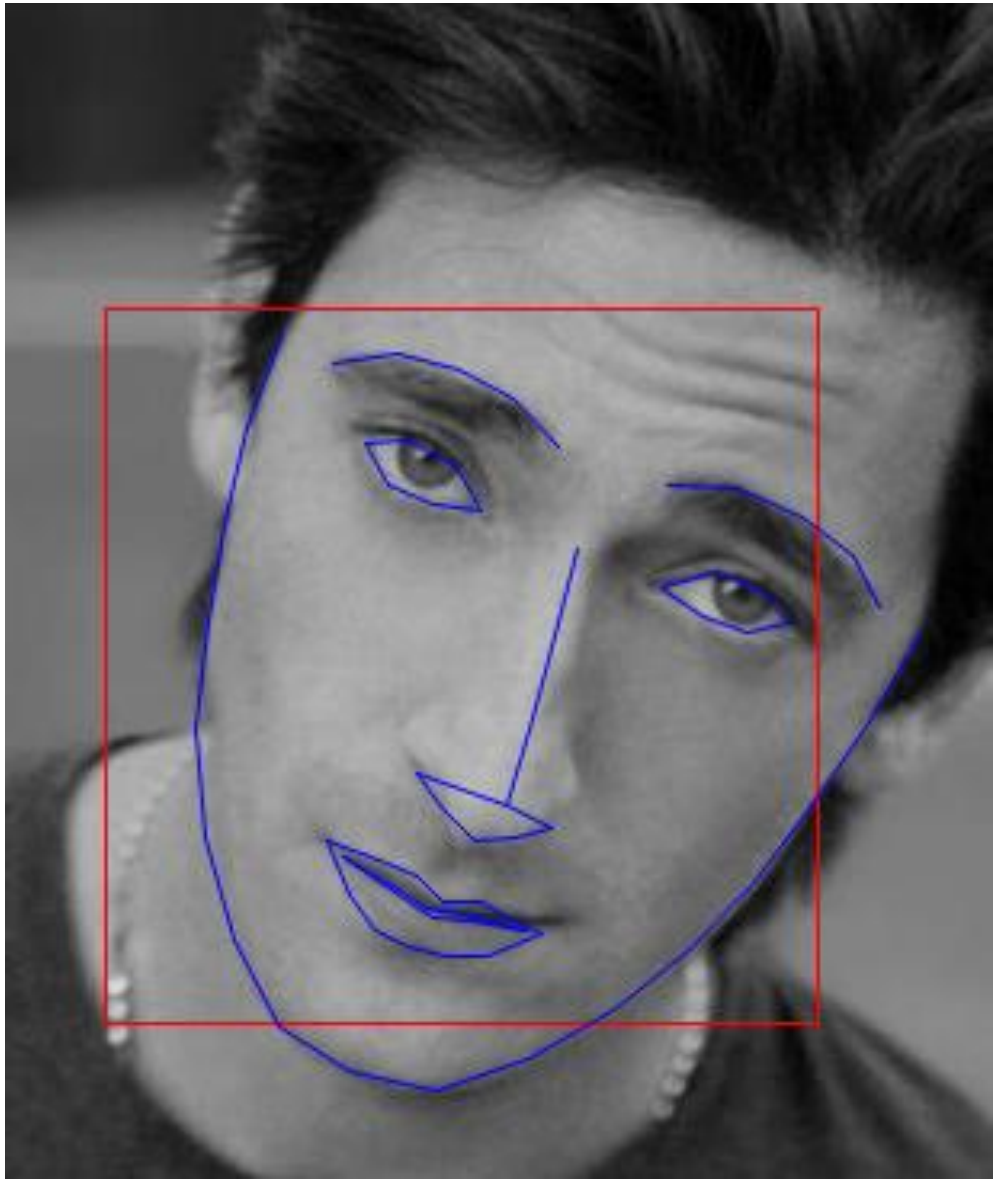
- **Dlib Library** > Find Face Landmarks
  - Face Landmarks: 68 points on known positions on a face.
- **OpenFace Library** > Transform picture according to the found landmarks (Face Alignment)



Face Landmarks

Found Land Marks

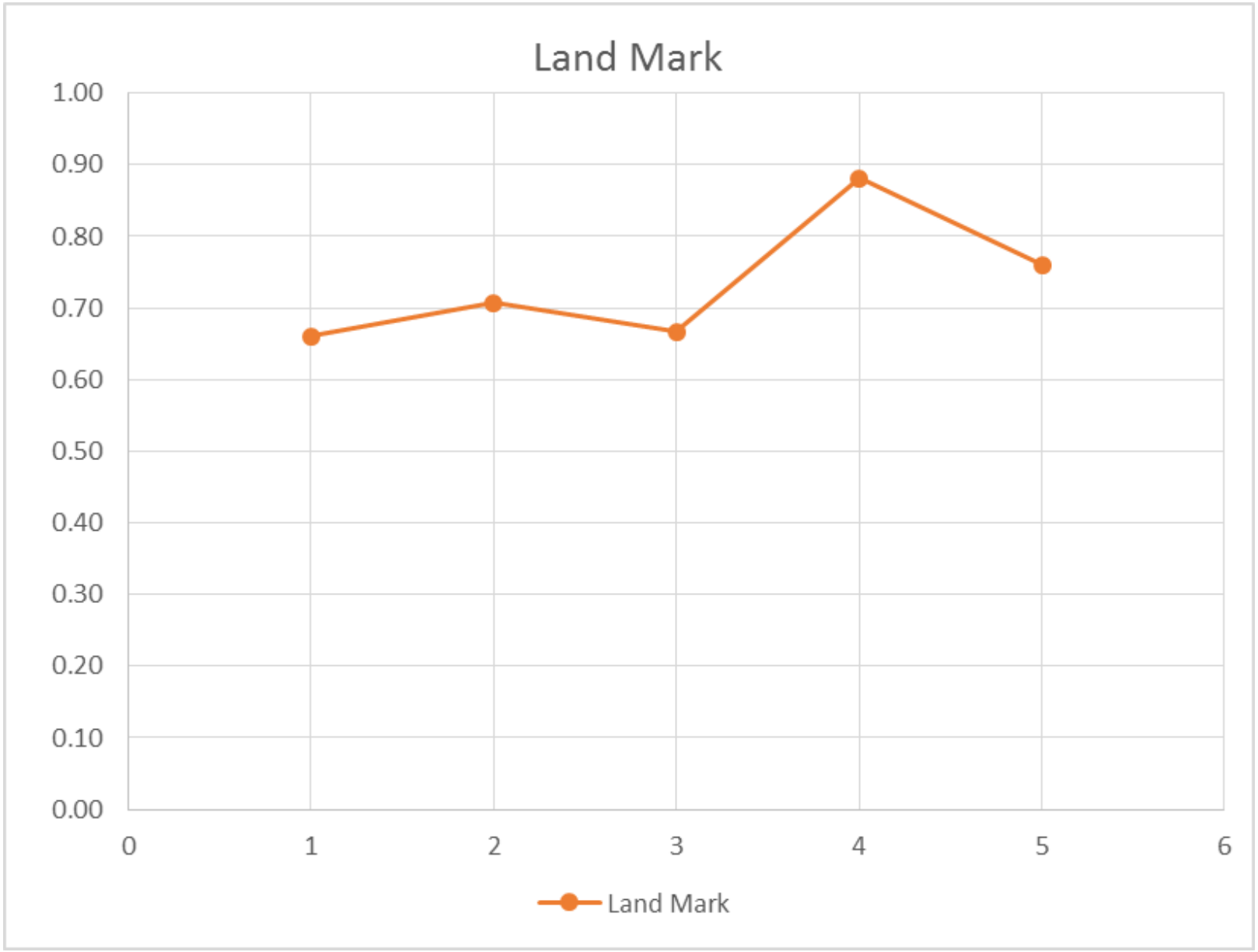




Faces Are Aligned!

Average Ratio of Identification:

74%



Improve Accuracy by Including Face Pictures Taken From **Many Angles**

Average Ratio of Identification:

84%