# Face To Face

Computer Vision for
Subject Identification

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# Preface

Computer vision is a topic of machine learning used develop techniques to for computers understand the content in images and video.

 Includes Object Detection

 Motion Analysis

 Facial Recognition

Facial recognition has become a common method of biometric identification. It has applications in banking, retail, and security.

# Data Description

**30,000**
Images
**106,863**

**530**
Celebrities

**>200**
Images per Person
**200**

- **FaceScrub Dataset 2015**
- Broken URLs

H.-W. Ng, S. Winkler.
Proc. IEEE International Conference on Image Processing (ICIP), Paris, France, Oct. 27-30, 2014.

# Data Subset

**2,076**
Images

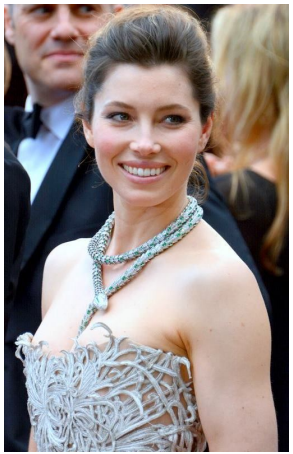
**26**
Celebrities

**80**
Average Images
Per Person

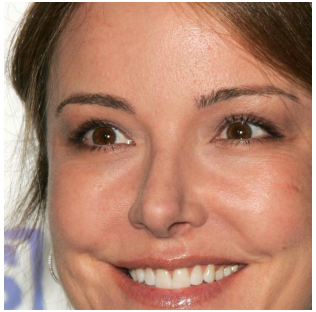
H.-W. Ng, S. Winkler.
Proc. IEEE International Conference on Image Processing (ICIP), Paris, France, Oct. 27-30, 2014.

# Image Normalization

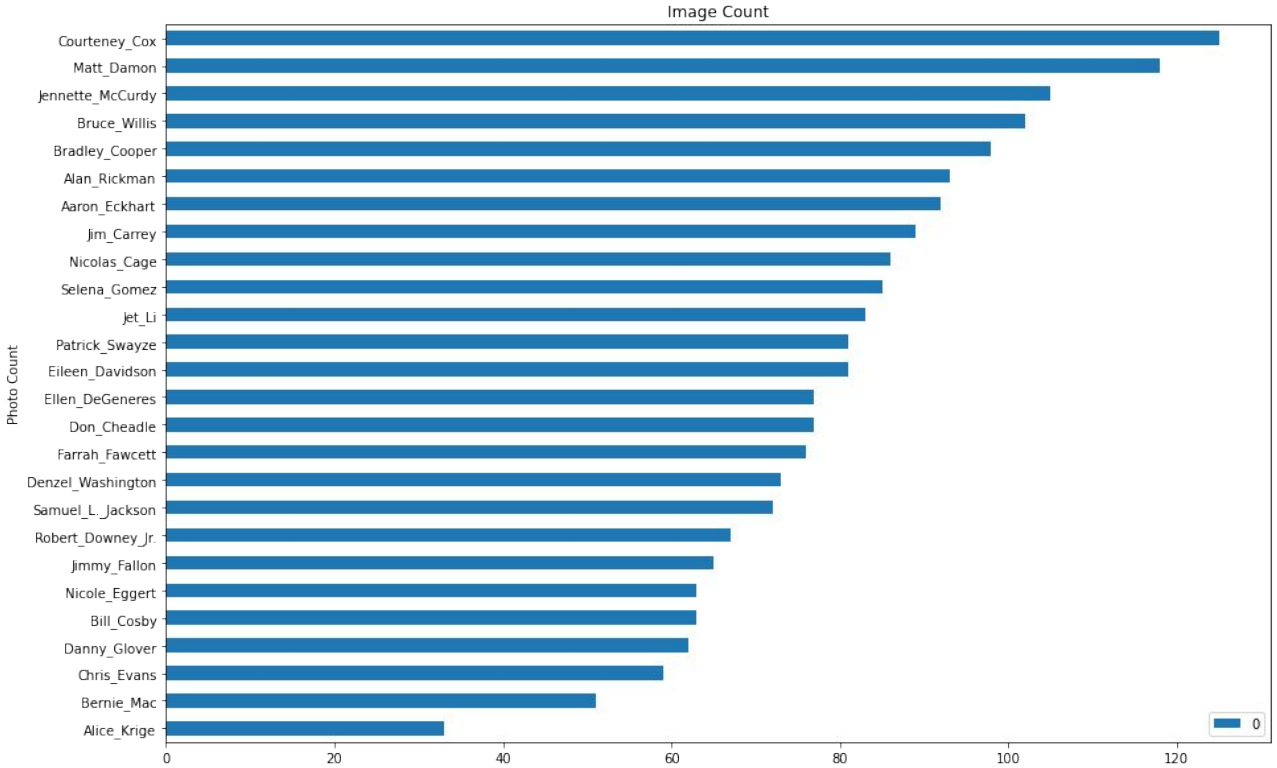
## Raw Images




## Normalized Photos



# EDA




Top 5 Class Image Count

| | |
|---|---|
| Courteney Cox | 125 |
| Matt Damon | 118 |
| Jennette McCurdy | 105 |
| Bruce Willis | 102 |
| Bradley Cooper | 98 |

# Post Modeling EDA

Morphed images found after modeling, affecting the prediction

Samuel L Jackson

"* The original release of FaceScrub contained slightly more face images (107,818) but included a number of duplicates as well as a few mislabeled and morphed faces. These have been removed from the database with effect from March 2016."

# Modeling

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## Baseline

Baseline
Calculation
Most Frequent
**6%**

●●●○○

## Sequential

Trial and Error
Batch Size: 10
Adam optimizer

●●●●○

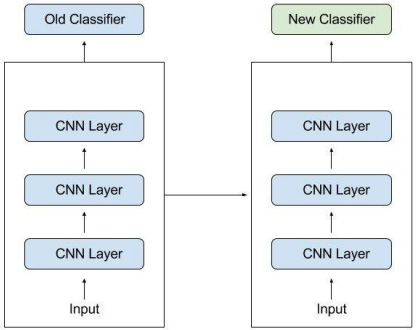
## AlexNet

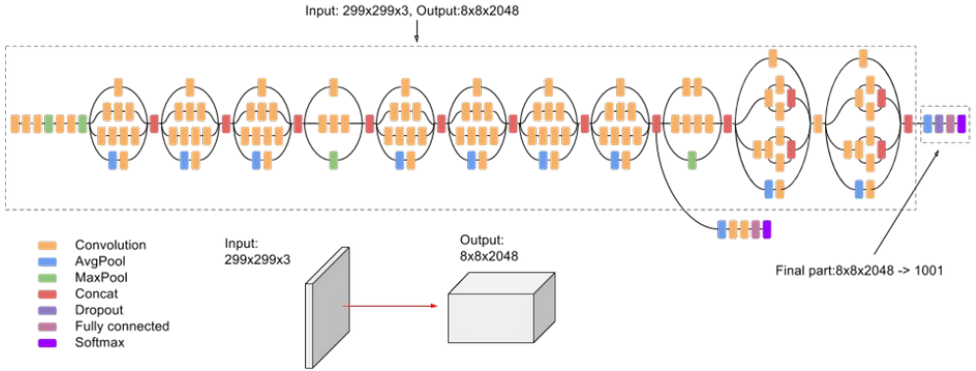
Architecture Replicated
Batch Size: 32
Max pooling
Adam optimizer : lr =.001

# Final Model

## Inception V3

Batch size: 64
Avg pooling
750 Epochs
Adam Optimizer: lr
.00001
Trained on ImageNet



# Model Results

| | Validation Accuracy | Validation Precision |
|---|---|---|
| Baseline | 6% | - |
| Sequential | 6% | 5% |
| AlexNet | 4% | 6% |
| **InceptionV3** | **59%** | **86%** |

*morphed image may be affecting prediction

# Further Research

- Apply More Transfer Learning Models Such as VGG, ResNet
- Rerun the Model Using Entire Dataset
- Clean morphed images/duplicates

# Tools Used






# Thanks

Do you have any questions?
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