Status Report: Face To BMI

Trung Pham • 29.05.2020

Overview

Expected delivery

May 28, 2020

Recent progress

- Train setting
- Train model for BMI
- Train model for Height
- Train model for Weight
- Cross validation train for BMI
- Cross validation train for Height
- Cross validation train for Weight
- Fixing crop face function
- Analyze test result for western data
- Analyze test result for asian data
- Train pretrained model to train on asian data

Train Setting

1. Training, Validation, Testing ratio: 0.72, 0.08, 0.2
    a. Training size 752 images/1026 images
    b. Validation size 96 images/1026 images
    c. Testing size 208 images/1026 images
2. Face detection algorithm
    a. Using dlib library -> fhog_object_detector

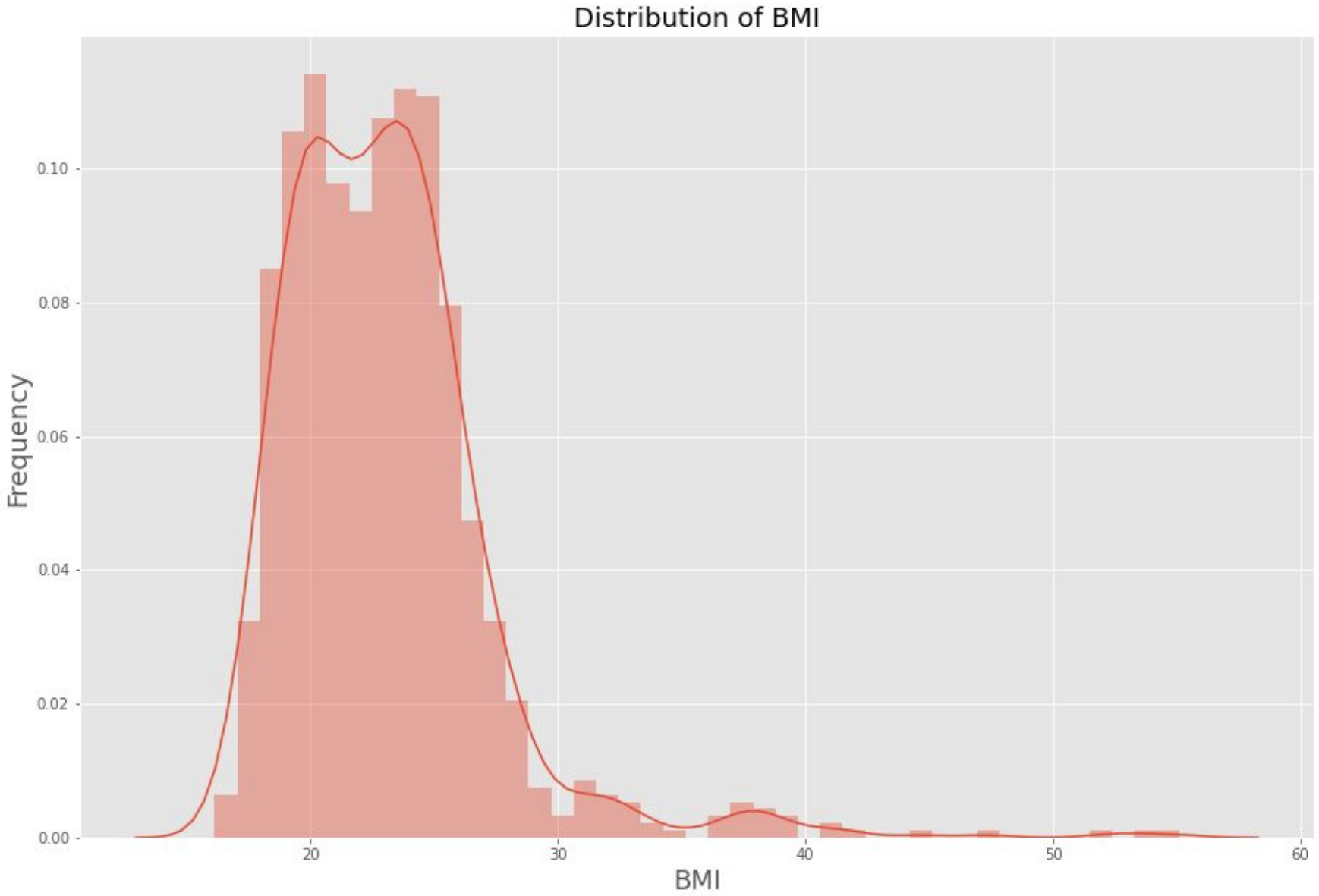
Train model for BMI, Weight, Height

Sample training: epochs = 500

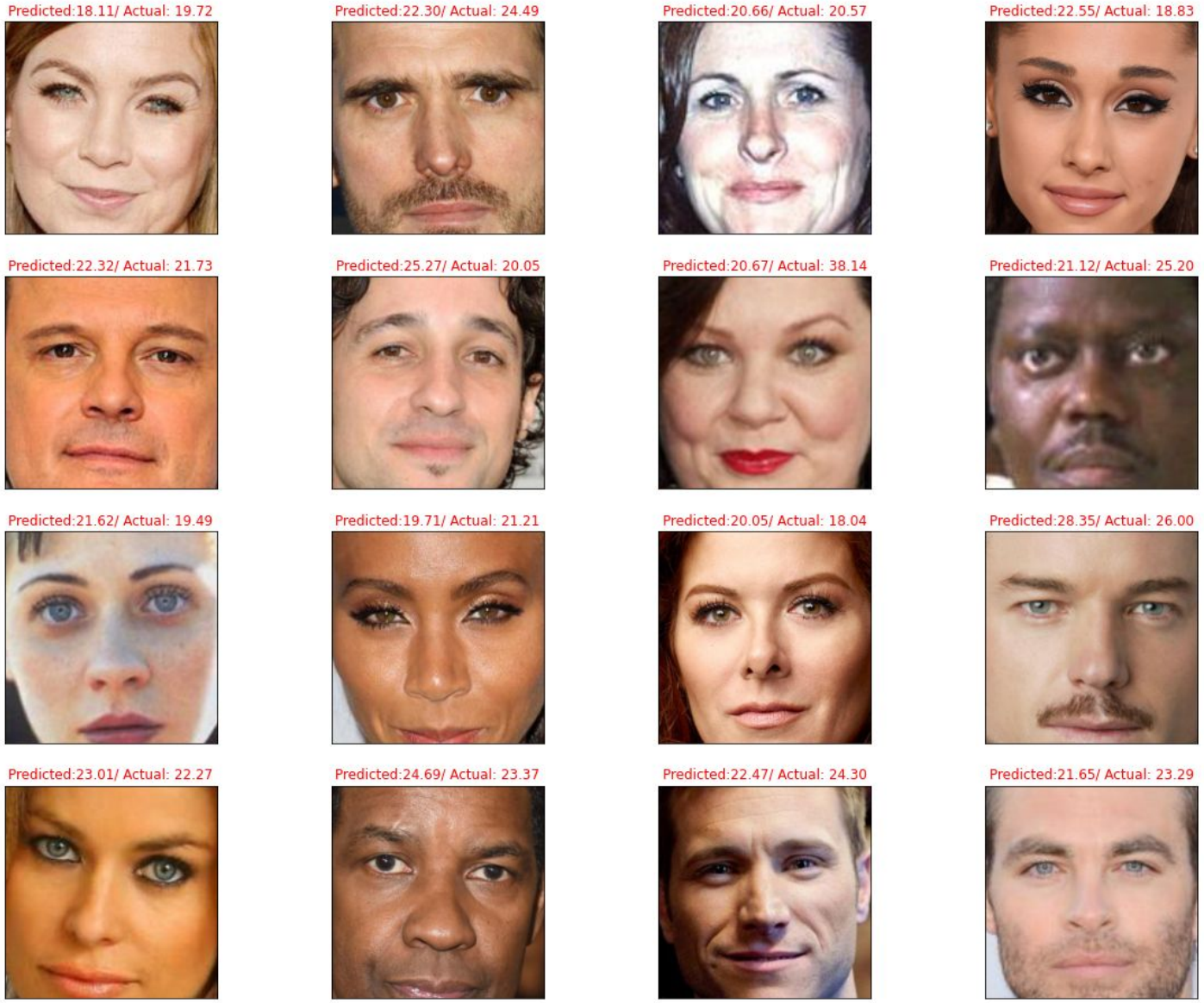
Cross Validation train: 20 times, each with 500 epochs

Final train: epochs = 5000

Cross validation train for BMI



Cross validation train for BMI - Sample

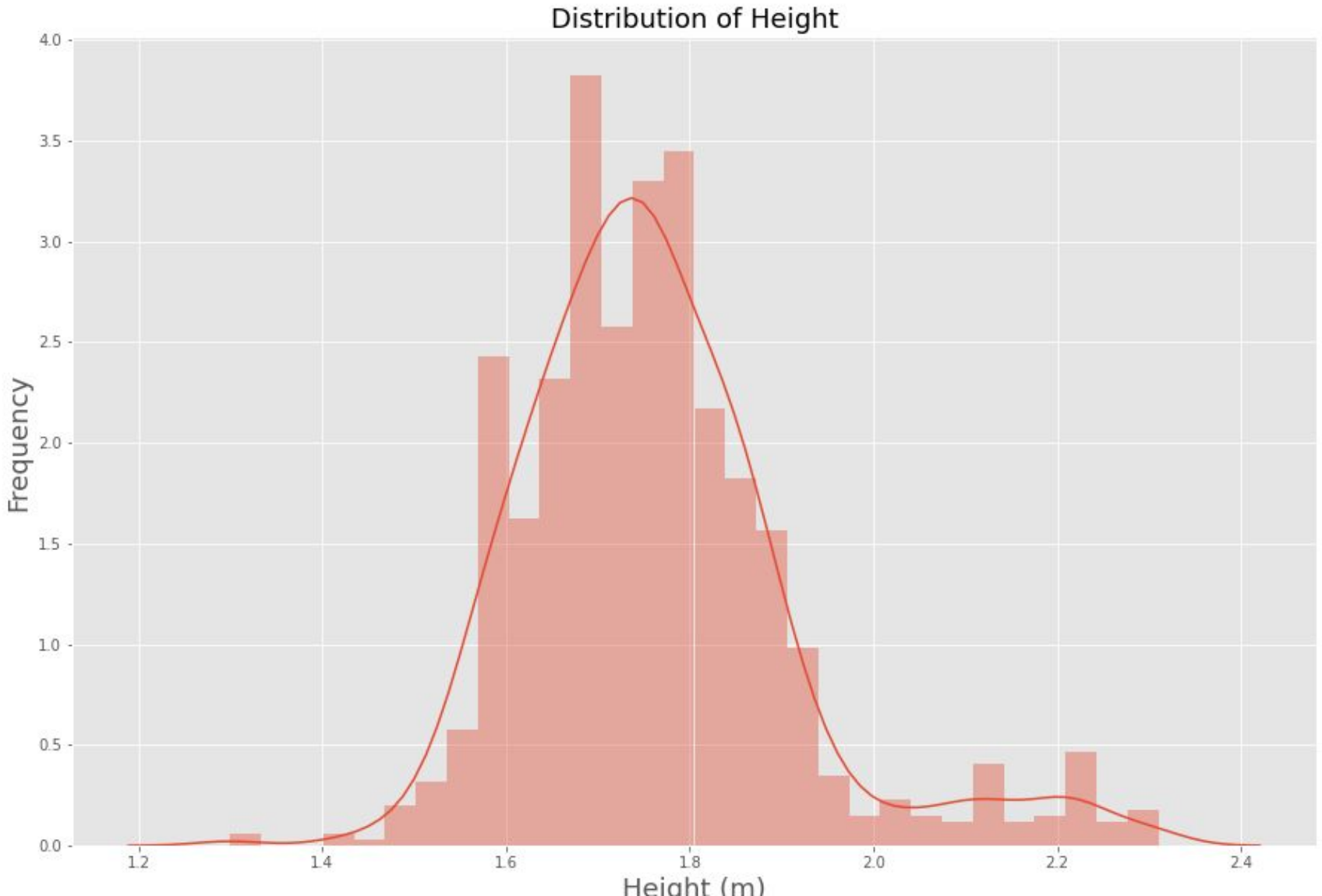


Testing result distribution for cross validation on BMI

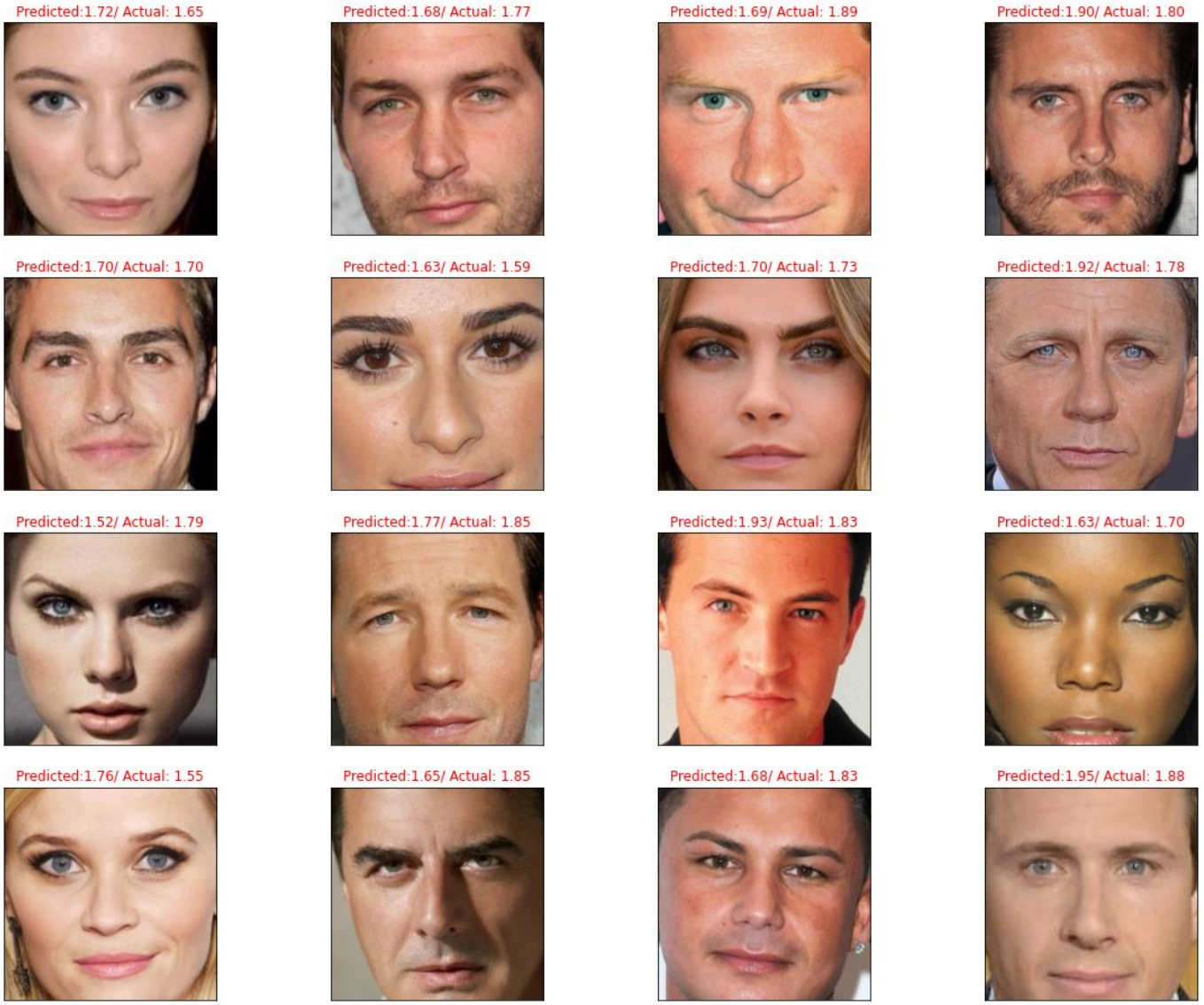
Error distribution

Count :	206
Mean:	2.148342
Std:	2.702871
Min:	0.010359
25%:	0.622971
50%:	1.658
75%:	2.722138
Max:	31.54

Cross validation train for Height



Cross validation train for Height - Sample

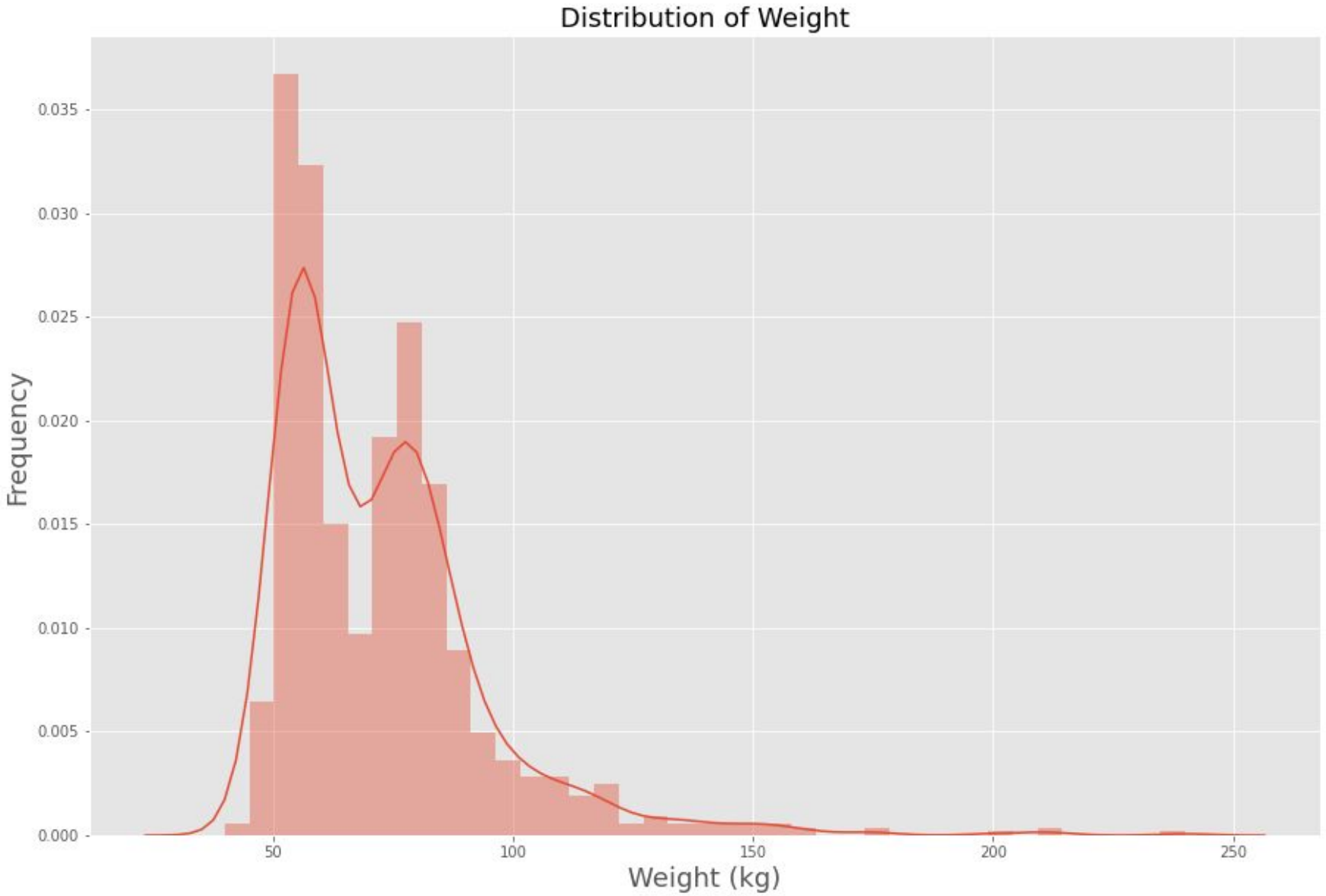


Testing result distribution for cross validation on Height

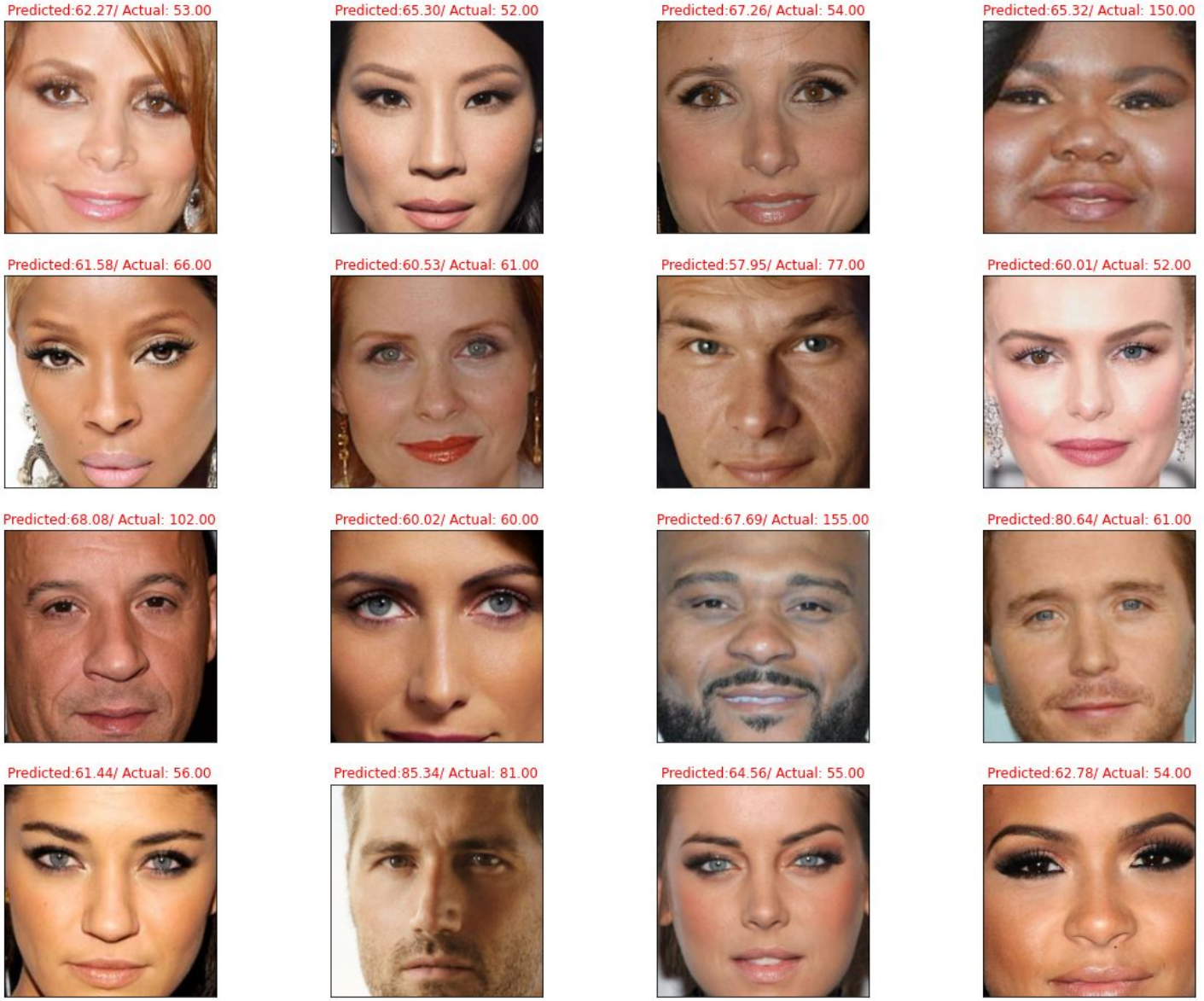
Error distribution

Count :	206
Mean:	2.148342
Std:	2.702871
Min:	0.010359
25%:	0.622971
50%:	1.658
75%:	2.722138
Max:	31.54

Cross validation train Weight



Cross validation train Weight - Sample



Testing result distribution for cross validation on Weight

Error distribution

Count :	206
Mean:	2.148342
Std:	2.702871
Min:	0.010359
25%:	0.622971
50%:	1.658
75%:	2.722138
Max:	31.54

Fixing crop face function

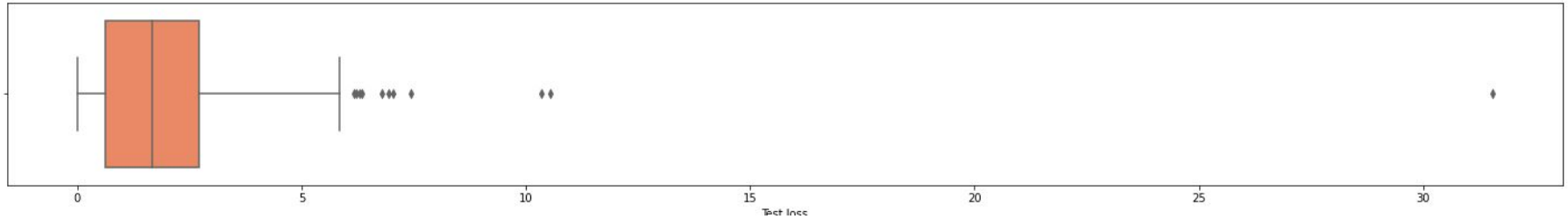
New crop no margin/ Average Error: 3.170

Old crop with 10% margin/ Average Error: 3.273

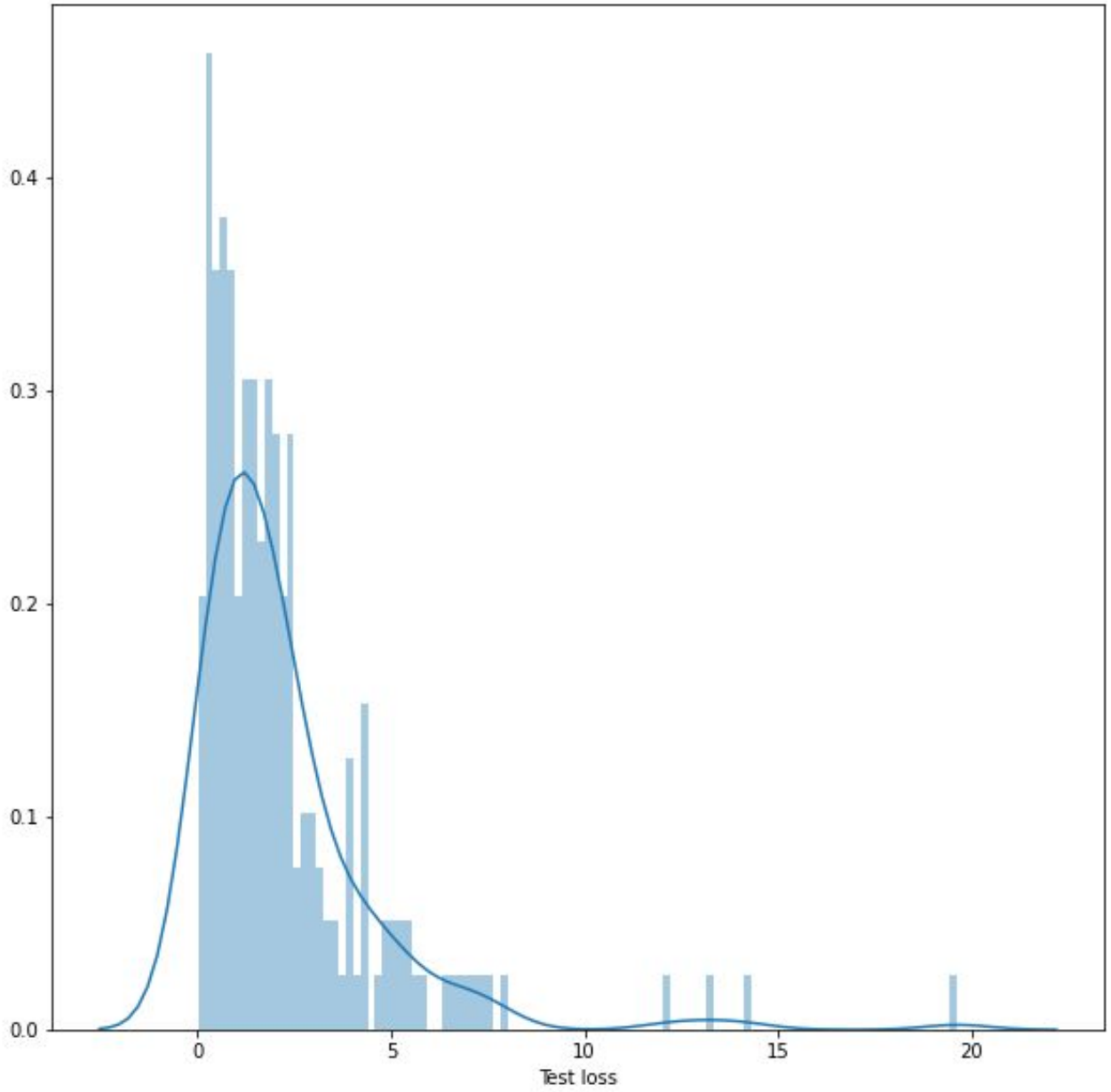
Analyze test result for western data

Analyze BMI test result for western data

Count :	206
Mean:	2.148342
Std:	2.702871
Min:	0.010359
25%:	0.622971
50%:	1.658
75%:	2.722138
Max:	31.54



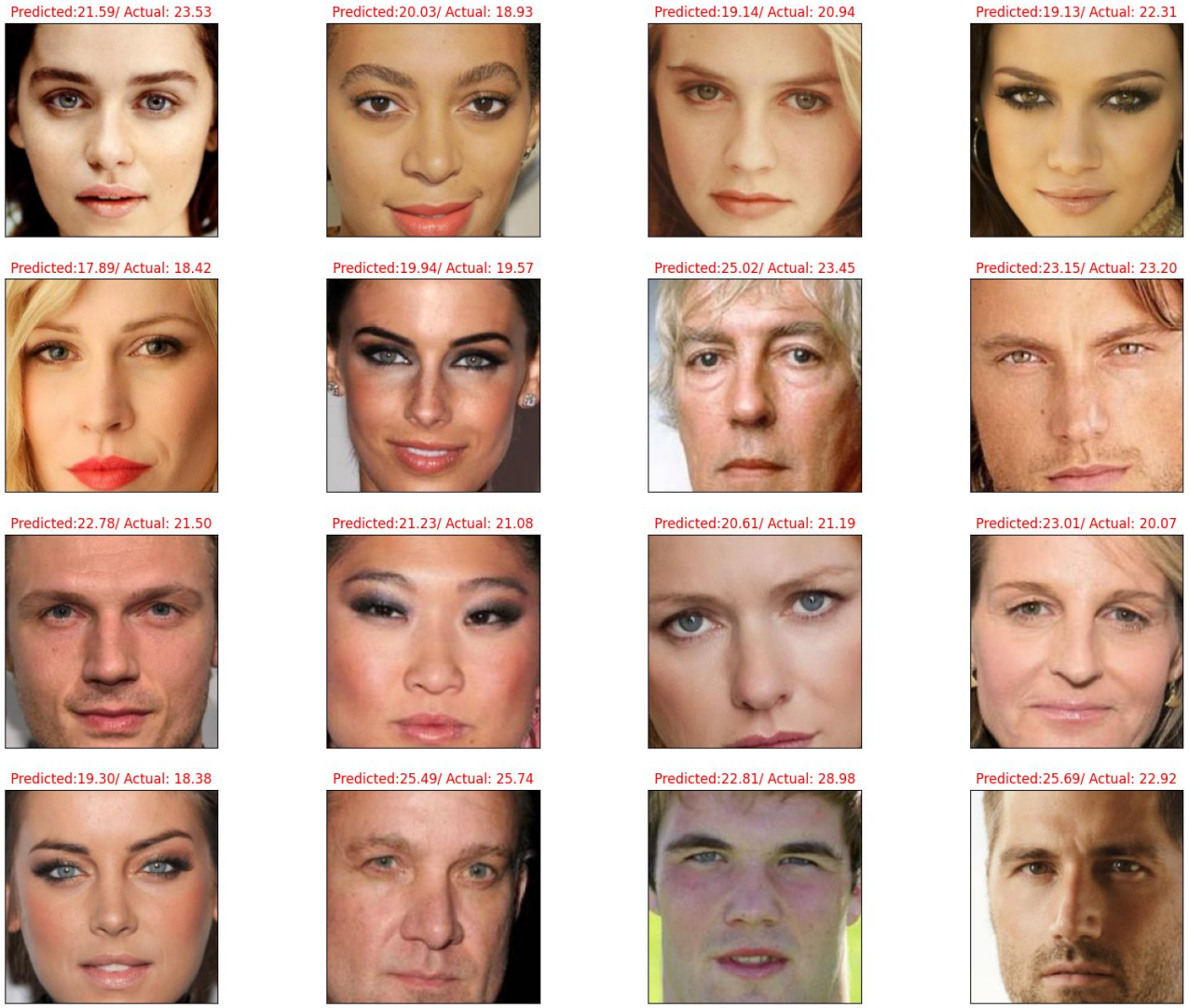
Analyze test result for western data



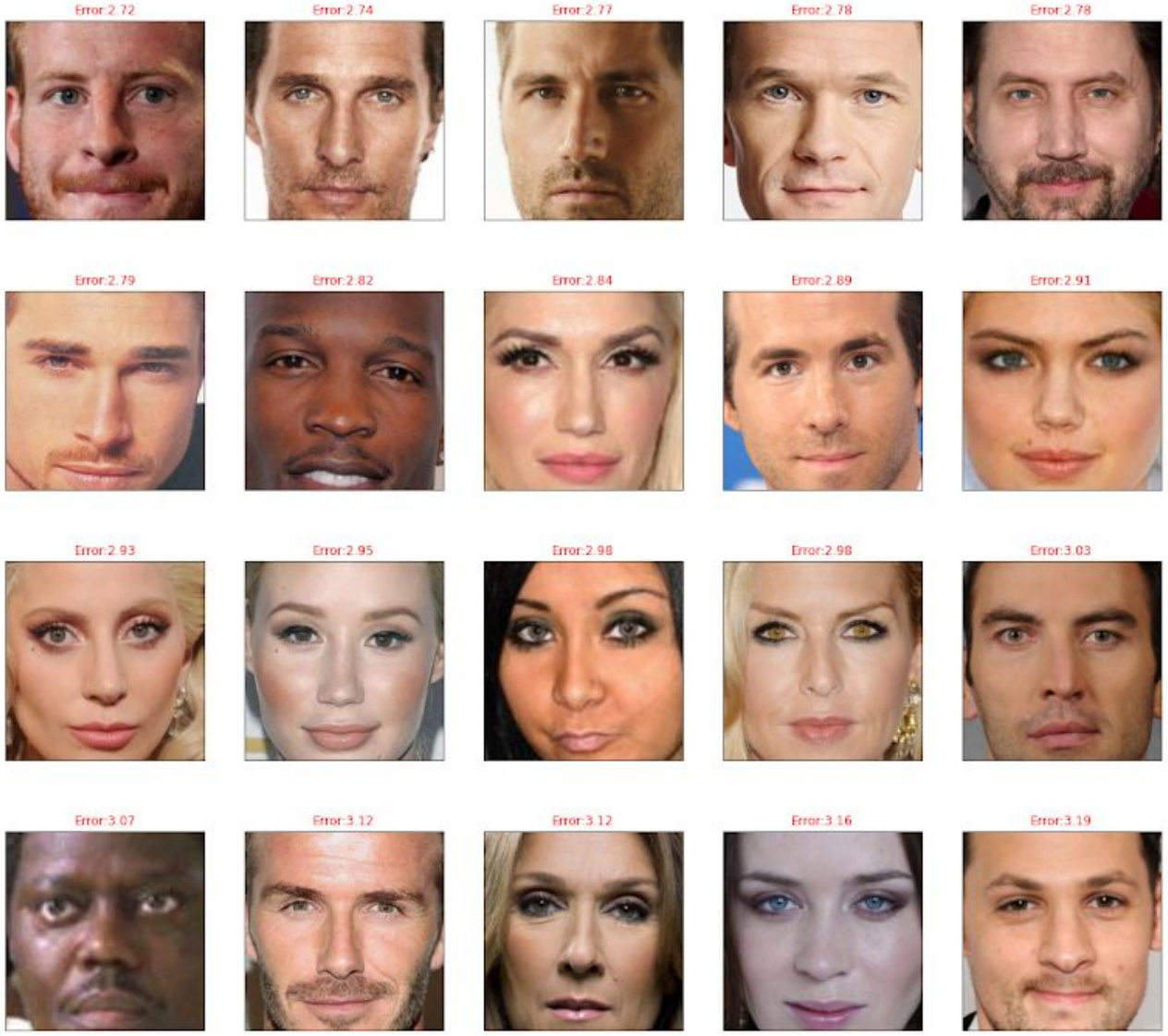
Error distribution

Count :	206
Mean:	2.148342
Std:	2.702871
Min:	0.010359
25%:	0.622971
50%:	1.658
75%:	2.722138
Max:	31.54

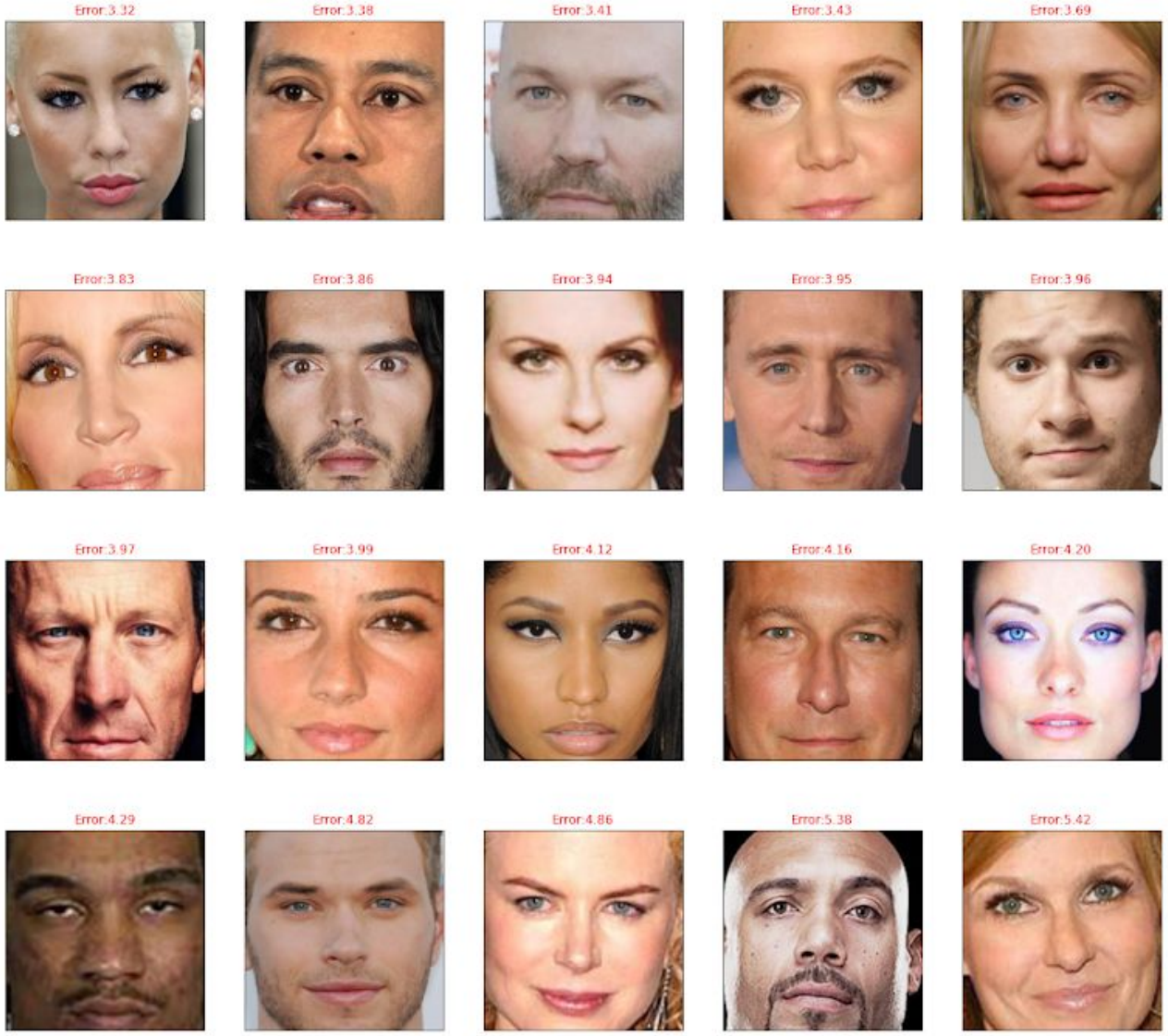
Analyze test result for western data - Sample



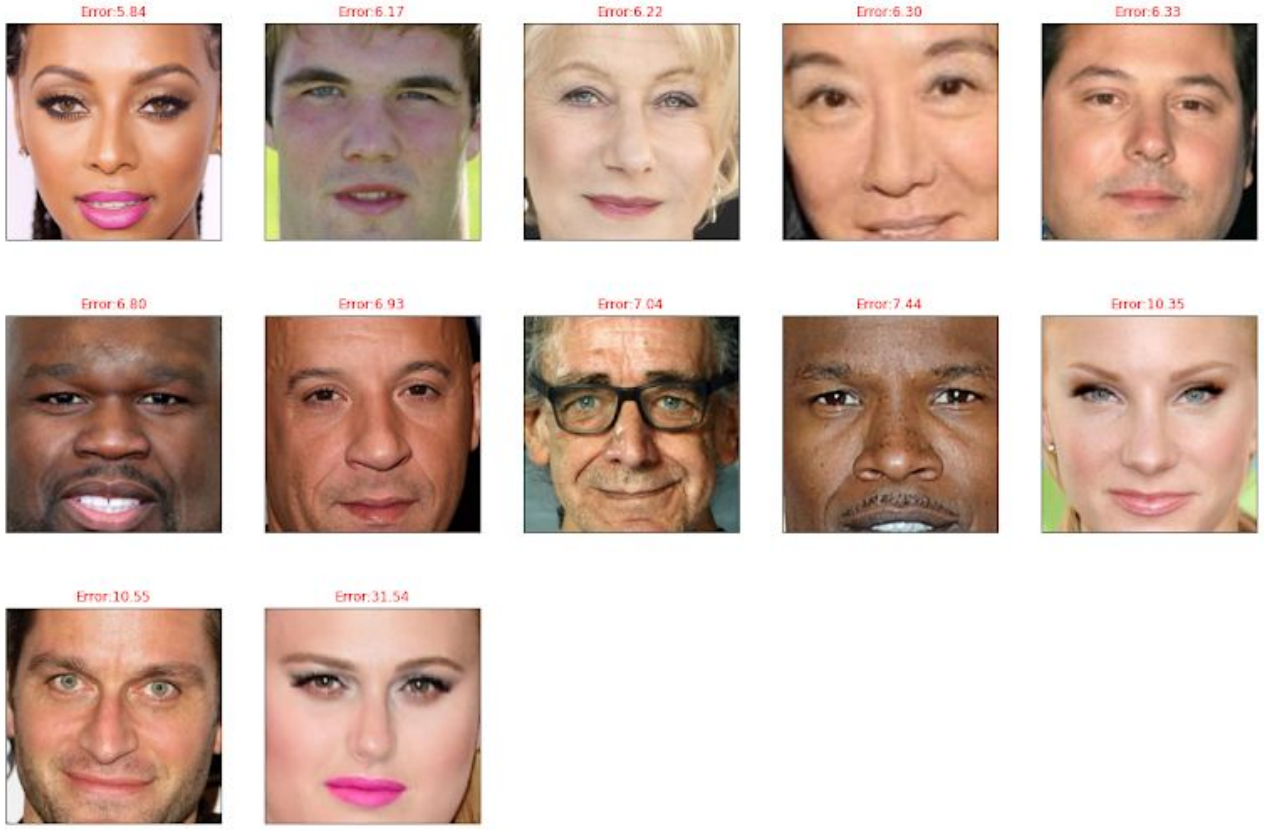
Test result for western data - Biggest error (>=2.72)



Test result for western data - Biggest error (>=2.72)



Test result for western data - Biggest error (>=2.72)



Analyze test result for western data - Biggest error

Reasons for error:

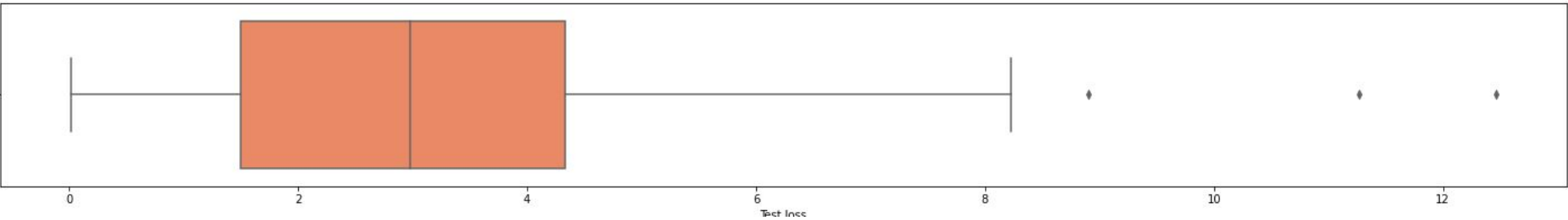
1. Bad image: not complete face, losing some parts of face
2. Bad data:
   a. Image and values are not taken as the same time
   b. Incorrect data
3. 29/52 largest error case are male
4. White people have larger error (43/52 are white people)

Main reason: bad data

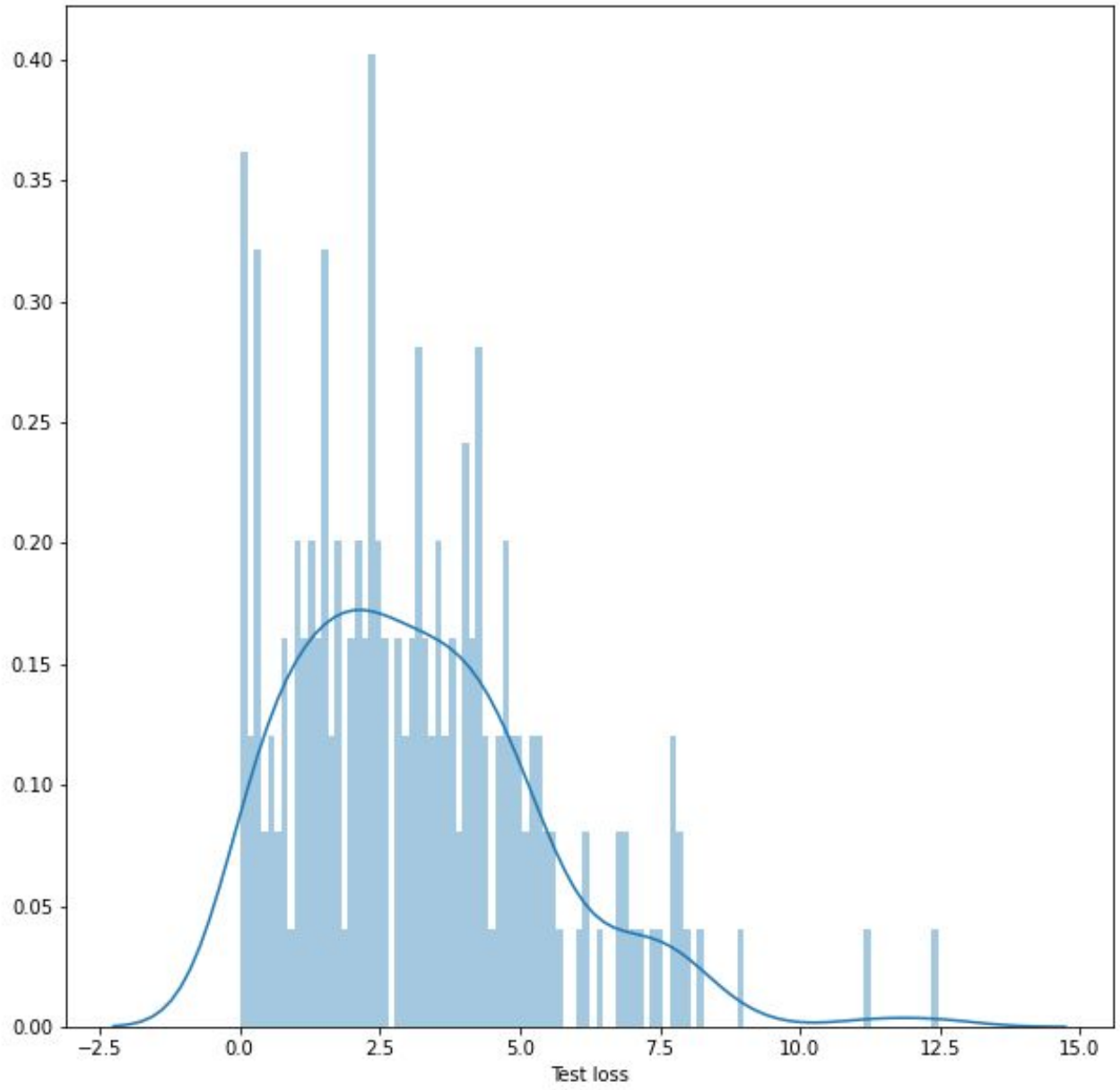
Analyze BMI test result for Asian data

Analyze test result for asian data

Count :	208
Mean:	3.170377
Std:	2.212229
Min:	0.019562
25%:	1.492668
50%:	2.976602
75%:	4.336589
Max:	12.460855



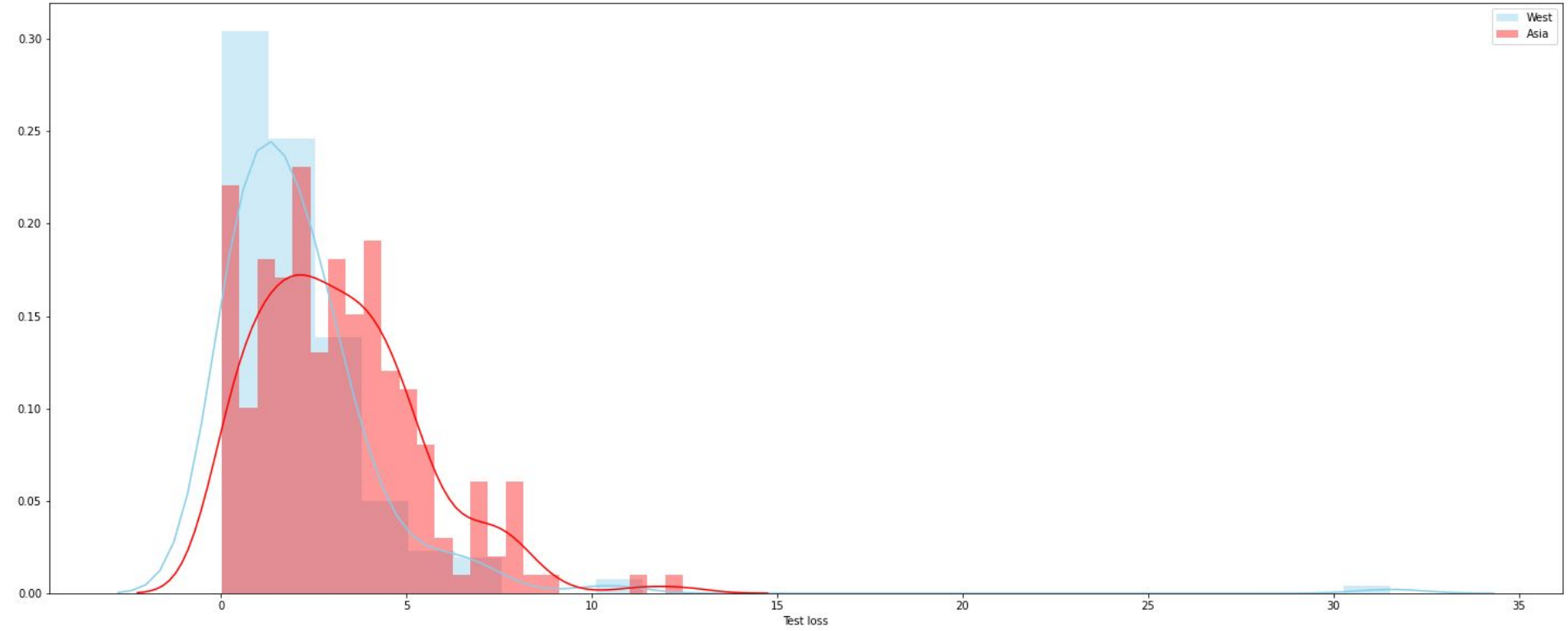
Analyze test result for asian data



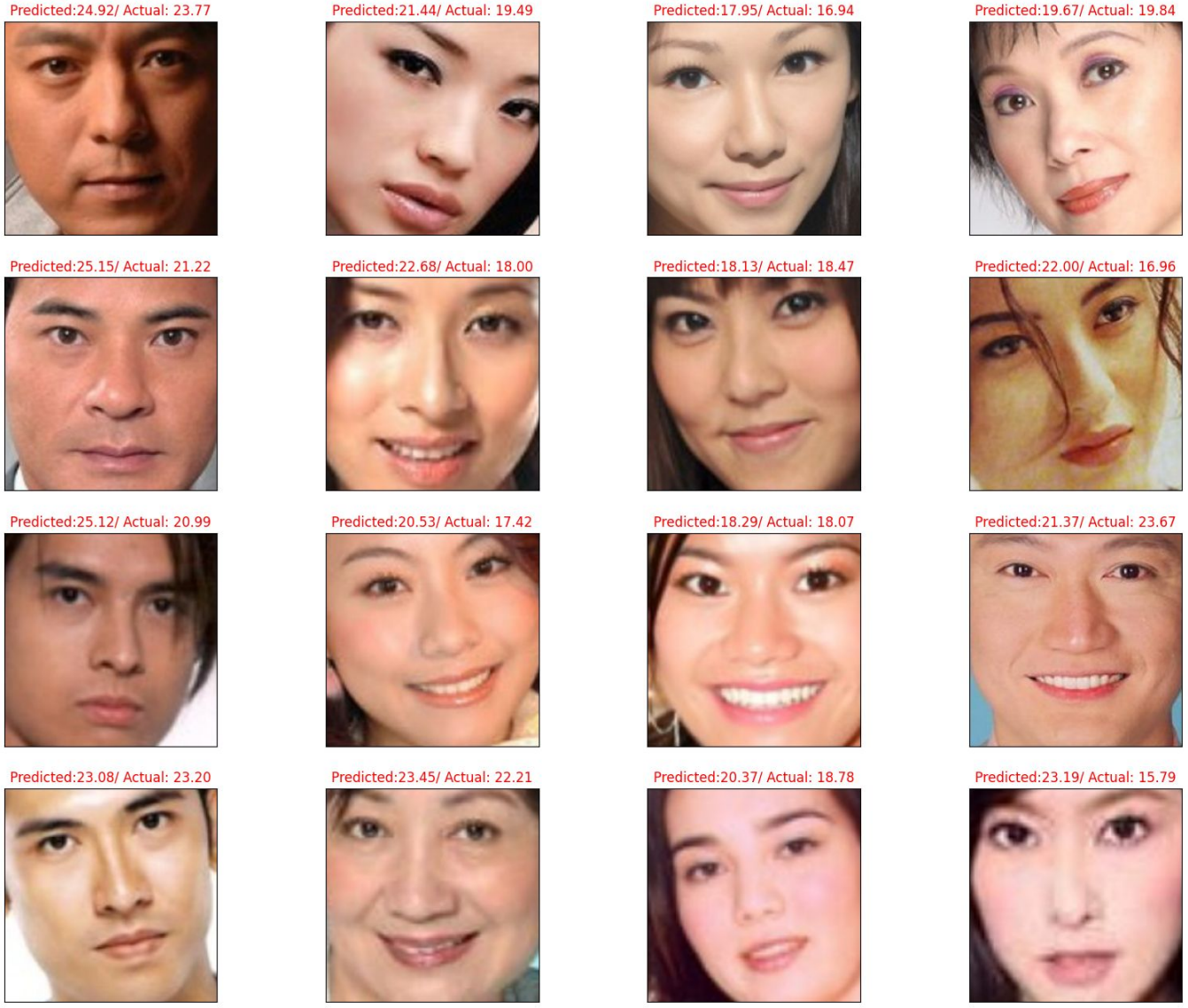
Error distribution

Count :	208
Mean:	3.170
Std:	2.212
Min:	0.019
25%:	1.492
50%:	2.976
75%:	4.336
Max:	12.46

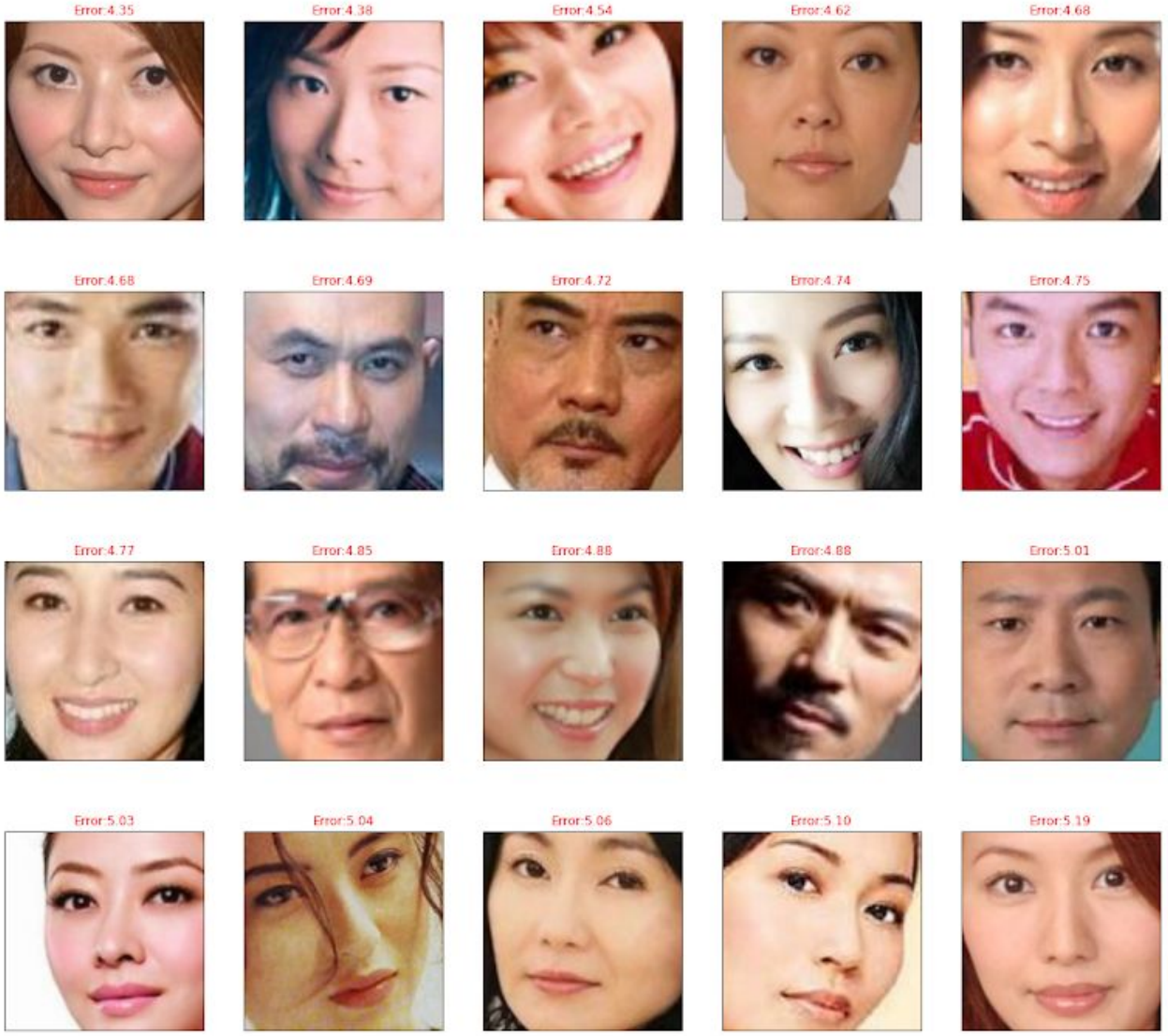
Error distribution West vs Asia



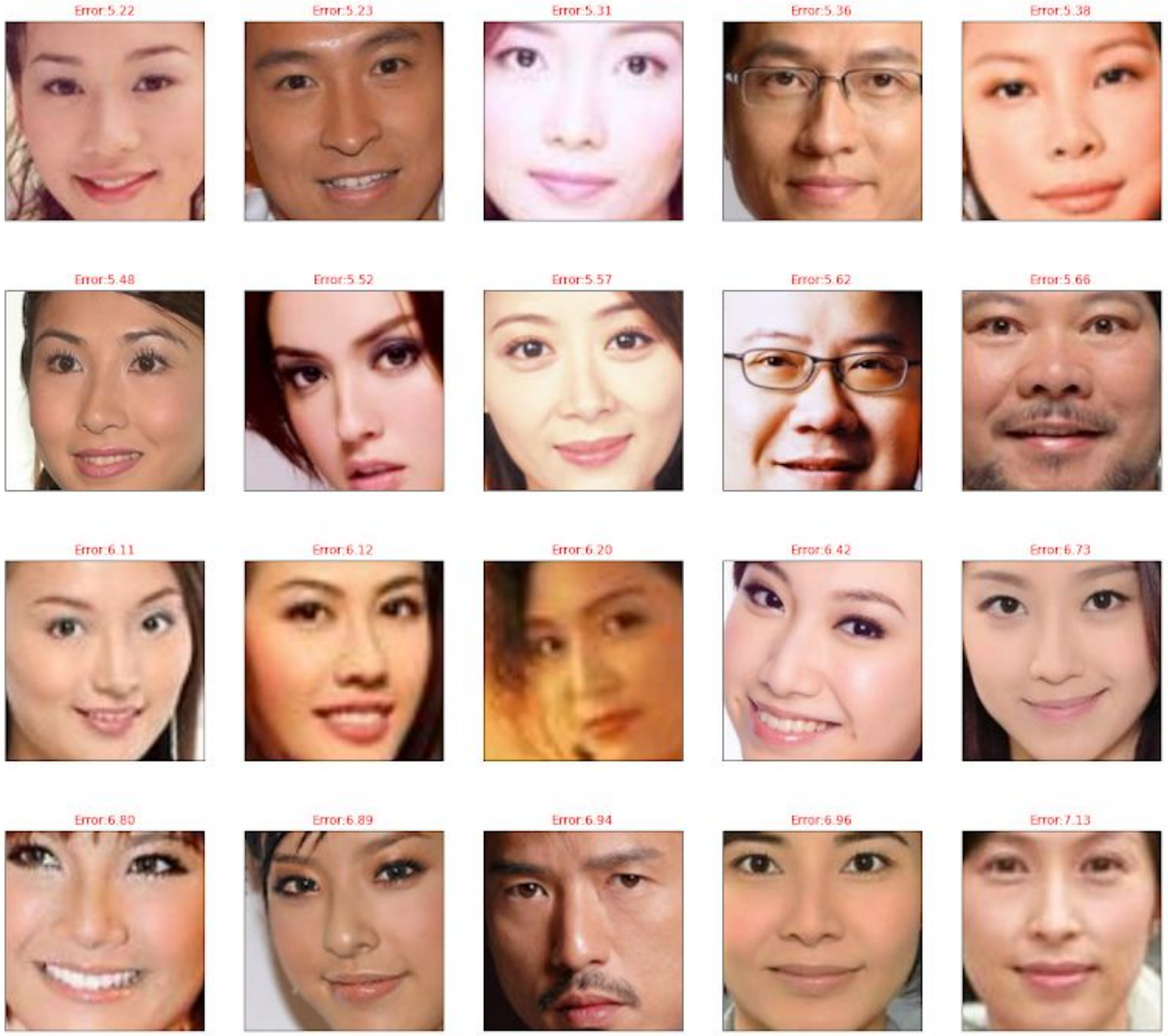
Analyze test result for asian data - Sample



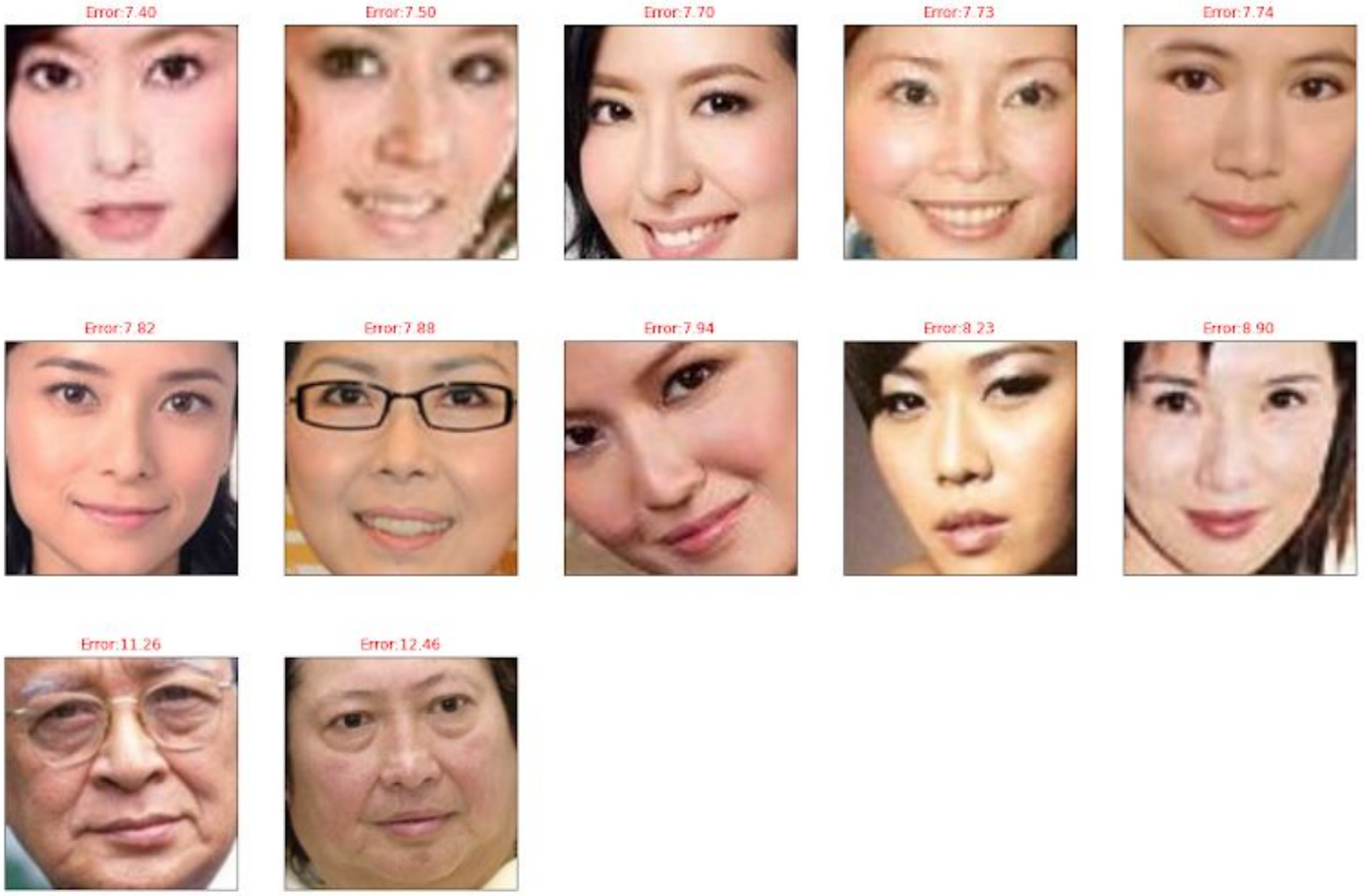
Test result for asian data - Biggest error (>=4.33)



Test result for asian data - Biggest error (>=4.33)



Test result for asian data - Biggest error (>=4.33)



Analyze test result for asian data - Biggest error

Reasons for error:

1. Bad image: not complete face, losing some parts of face
2. Bad data:
   a. Image and values are not taken as the same time
   b. Incorrect data
3. Women have larger error (40/52 are women)

Main reason: bad data

Train pretrained model to train on asian data

Model after training on asian data

Testing loss with asia data is: 1.818 (Before training is 3.17)

Asian model testing - Sample