RESEARCH MEETING V

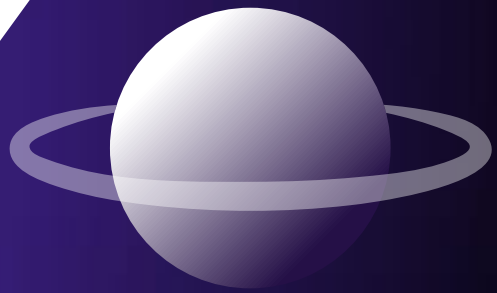
Presented by:
RENE L. PRINCIPE JR.

On Macbeth:

- Mimic the hyperspectral reconstruction errors observed in CAVE dataset
- Render and compare the colors of the original reflectance and the synthetically transformed reflectance.

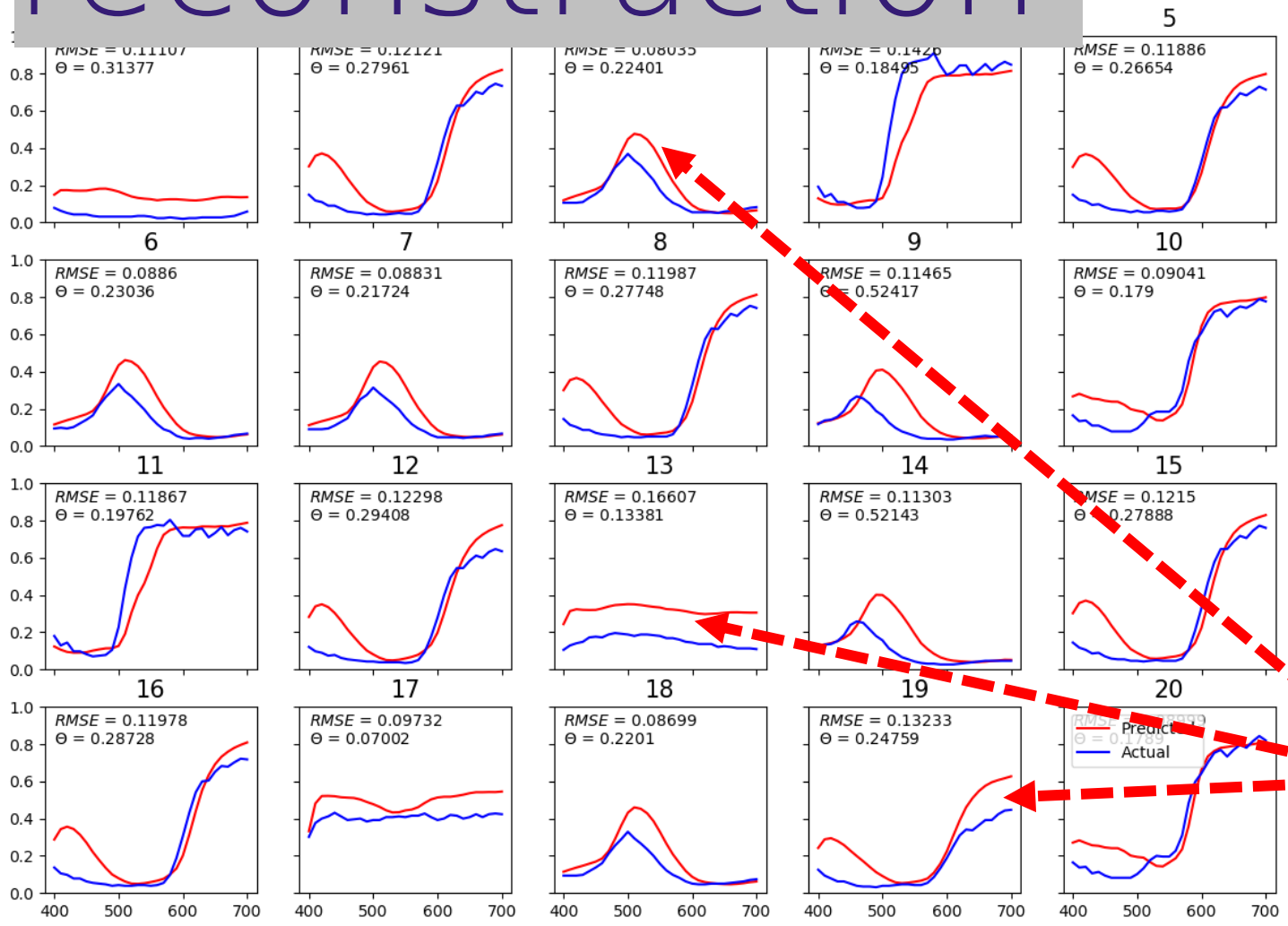
On CAVE dataset:

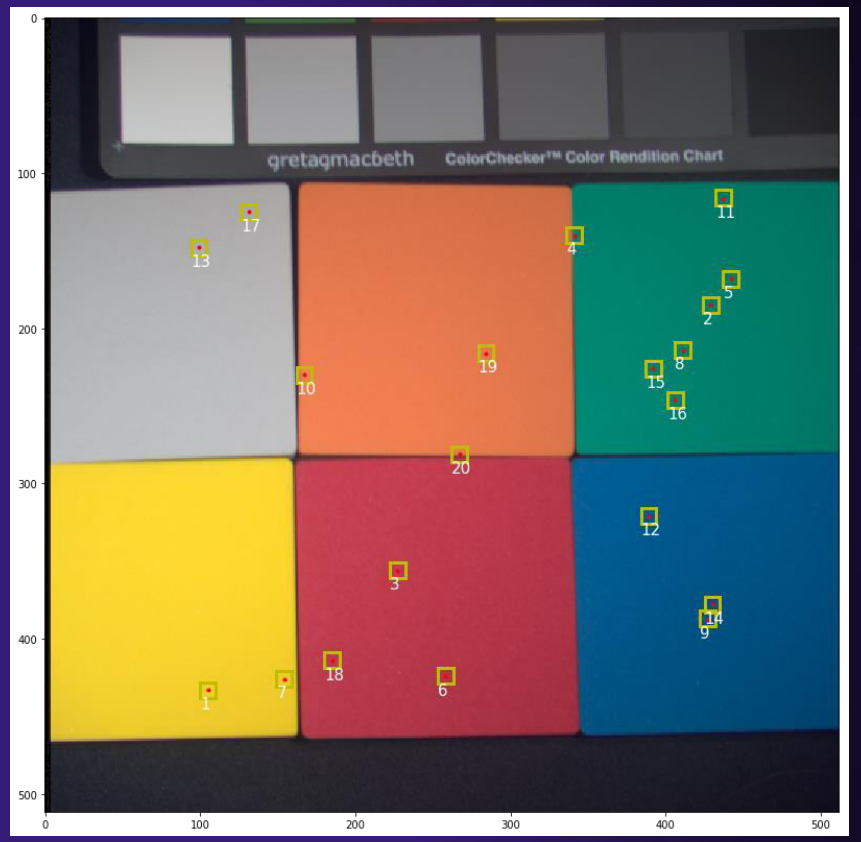
- From the predicted hyperspectral image cube, render the corresponding RGB



tasks

hyperspectral reconstruction





errors

error modeling

Gain

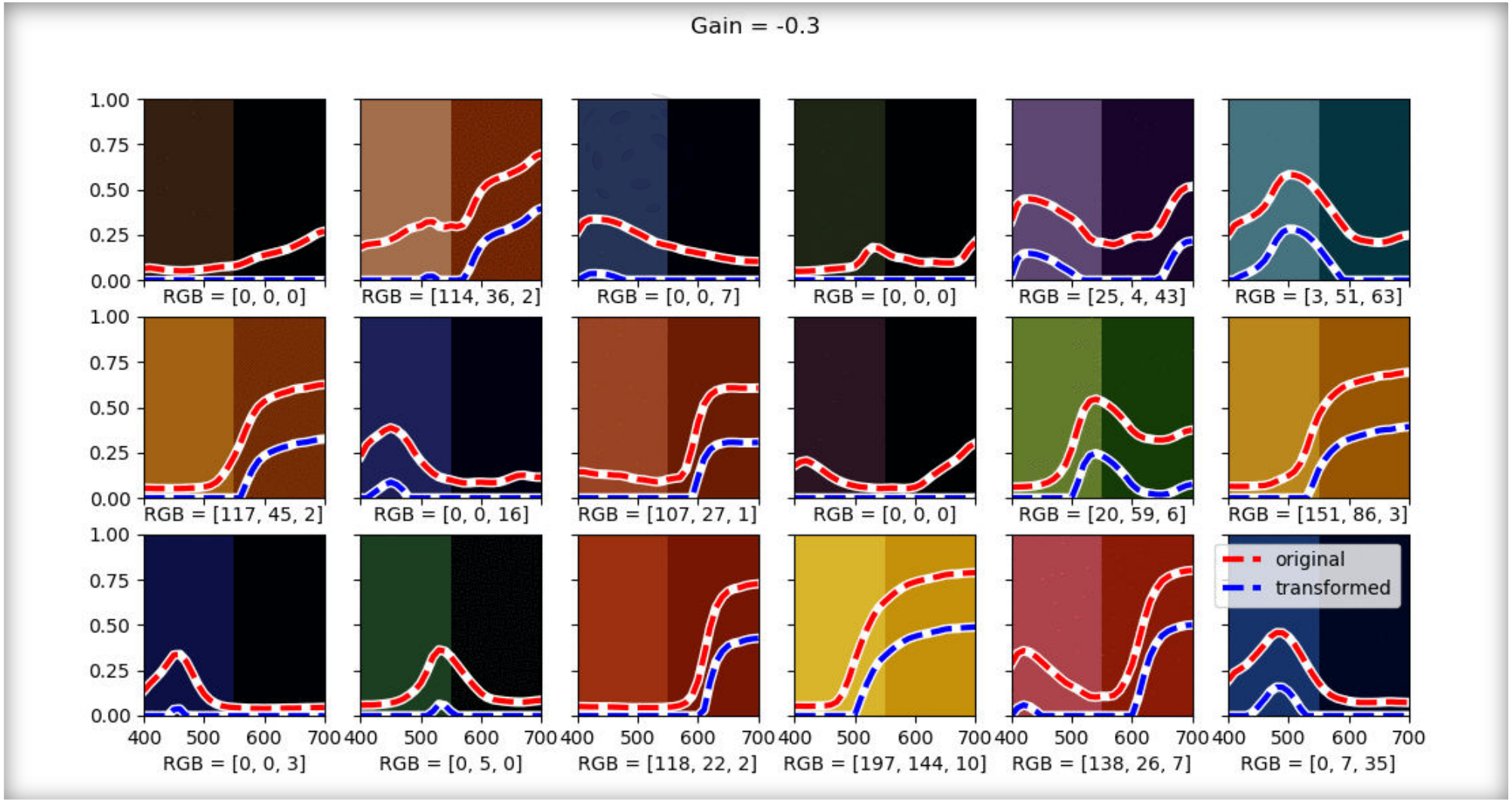
-uniform addition/subtraction to the spectrum

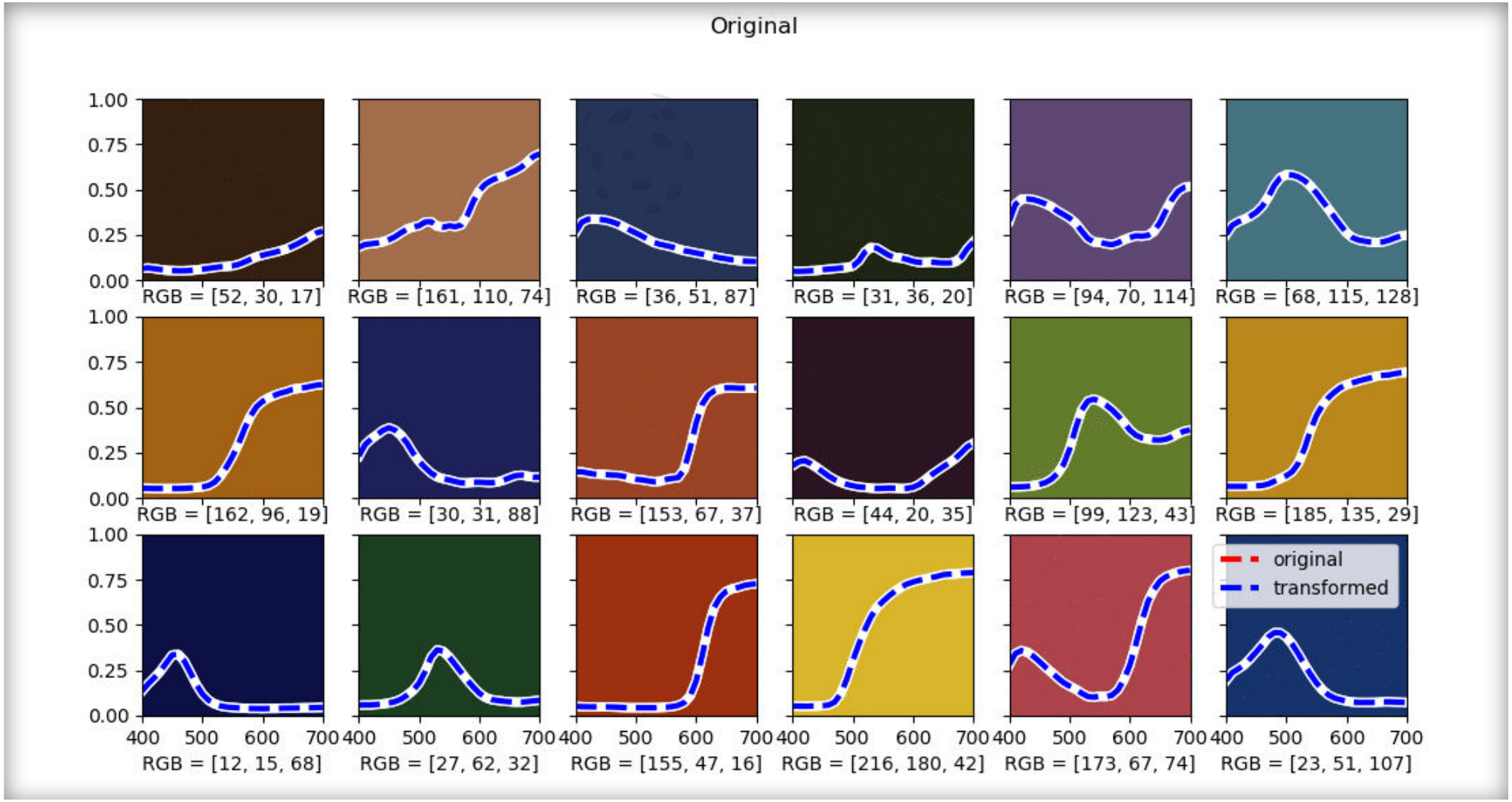
Contrast Stretching

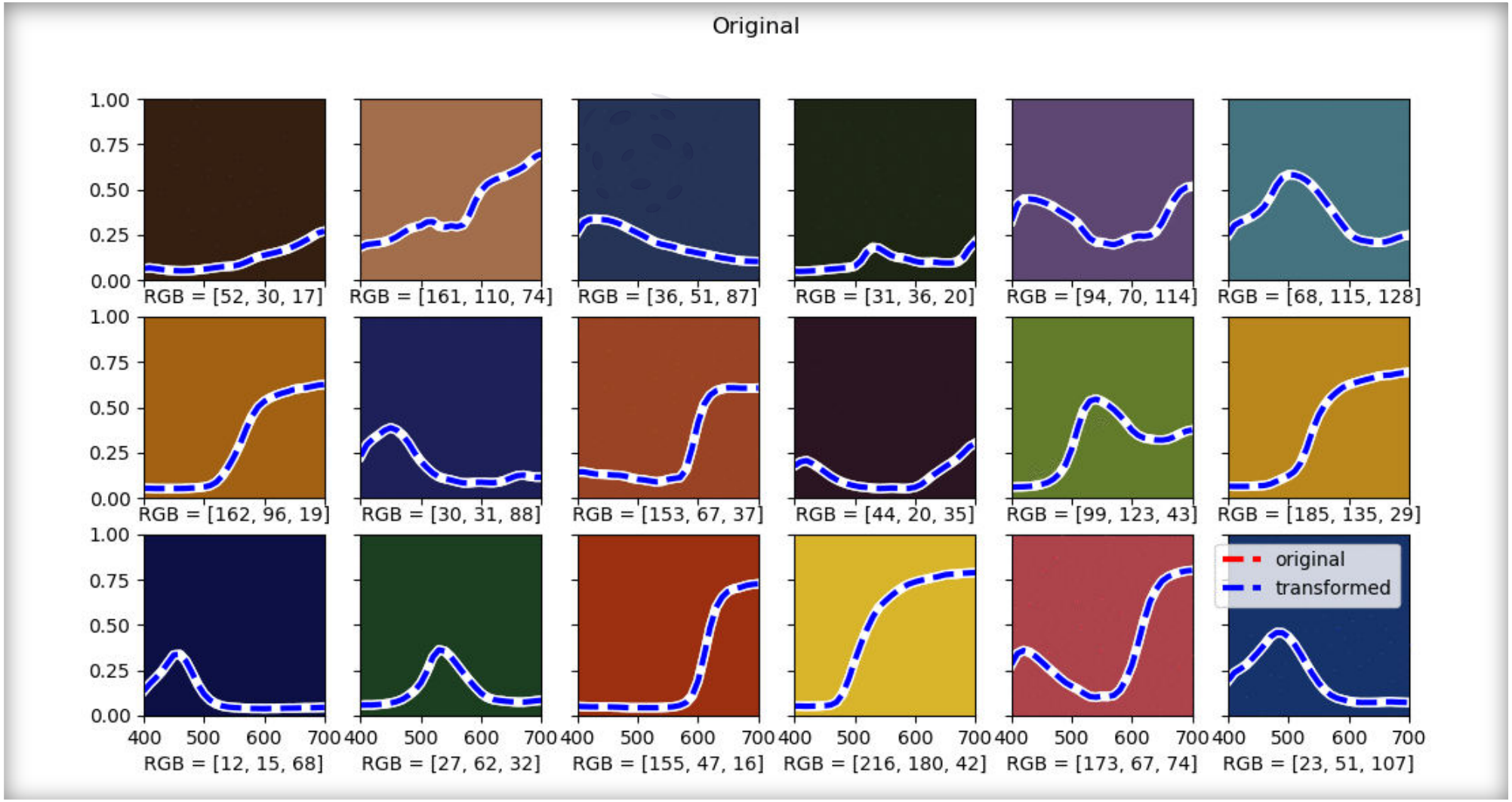
-amplifying the difference with respect to the mean

Translation

-shifting the peaks to a different index


Gain = -0.3
1.00
0.75
0.50
0.25
0.00
RGB = [0, 0, 0]
RGB = [114, 36, 2]
RGB = [0, 0, 7]
RGB = [0, 0, 0]
RGB = [25, 4, 43]
RGB = [3, 51, 63]
RGB = [117, 45, 2]
RGB = [0, 0, 16]
RGB = [107, 27, 1]
RGB = [0, 0, 0]
RGB = [20, 59, 6]
RGB = [151, 86, 3]
RGB = [0, 0, 3]
RGB = [0, 5, 0]
RGB = [118, 22, 2]
RGB = [197, 144, 10]
RGB = [138, 26, 7]
RGB = [0, 7, 35]
400
500
600
700
original
transformed


Original
1.00
0.75
0.50
0.25
0.00
RGB = [52, 30, 17]
RGB = [161, 110, 74]
RGB = [36, 51, 87]
RGB = [31, 36, 20]
RGB = [94, 70, 114]
RGB = [68, 115, 128]
RGB = [162, 96, 19]
RGB = [30, 31, 88]
RGB = [153, 67, 37]
RGB = [44, 20, 35]
RGB = [99, 123, 43]
RGB = [185, 135, 29]
RGB = [12, 15, 68]
RGB = [27, 62, 32]
RGB = [155, 47, 16]
RGB = [216, 180, 42]
RGB = [173, 67, 74]
RGB = [23, 51, 107]
400
500
600
700
original
transformed


Original
1.00
0.75
0.50
0.25
0.00
RGB = [52, 30, 17]
RGB = [161, 110, 74]
RGB = [36, 51, 87]
RGB = [31, 36, 20]
RGB = [94, 70, 114]
RGB = [68, 115, 128]
RGB = [162, 96, 19]
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RGB = [153, 67, 37]
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RGB = [99, 123, 43]
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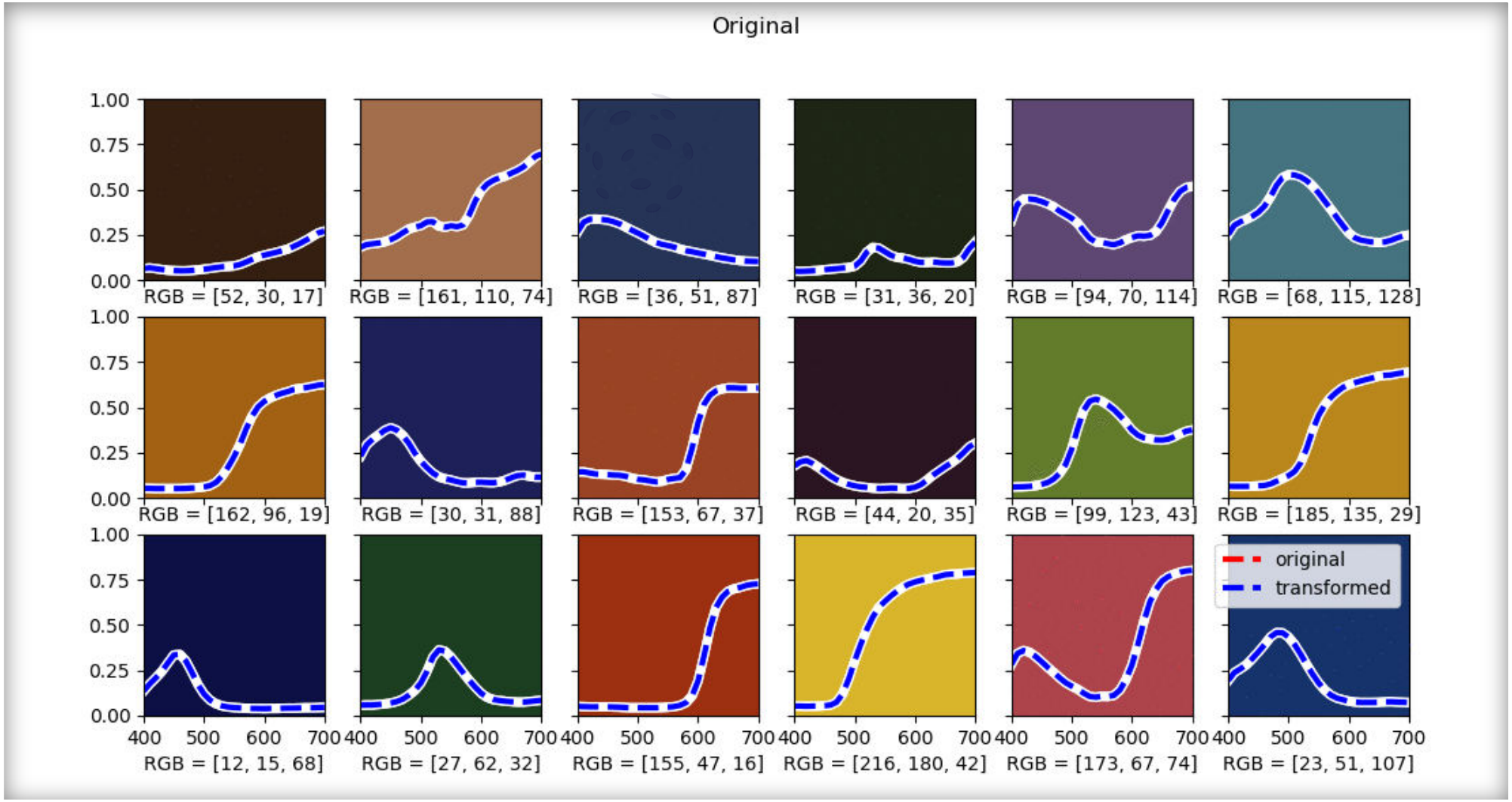
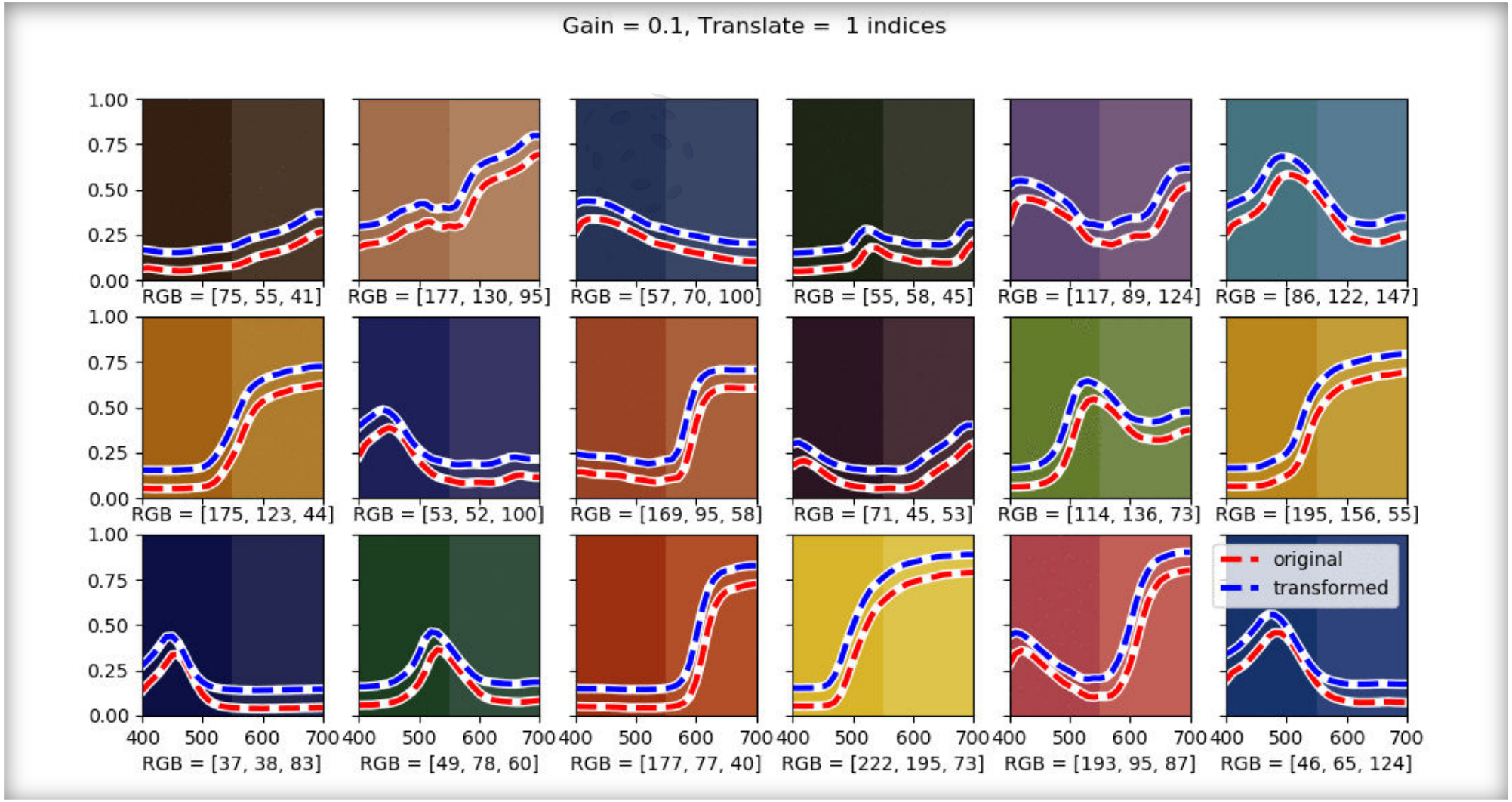
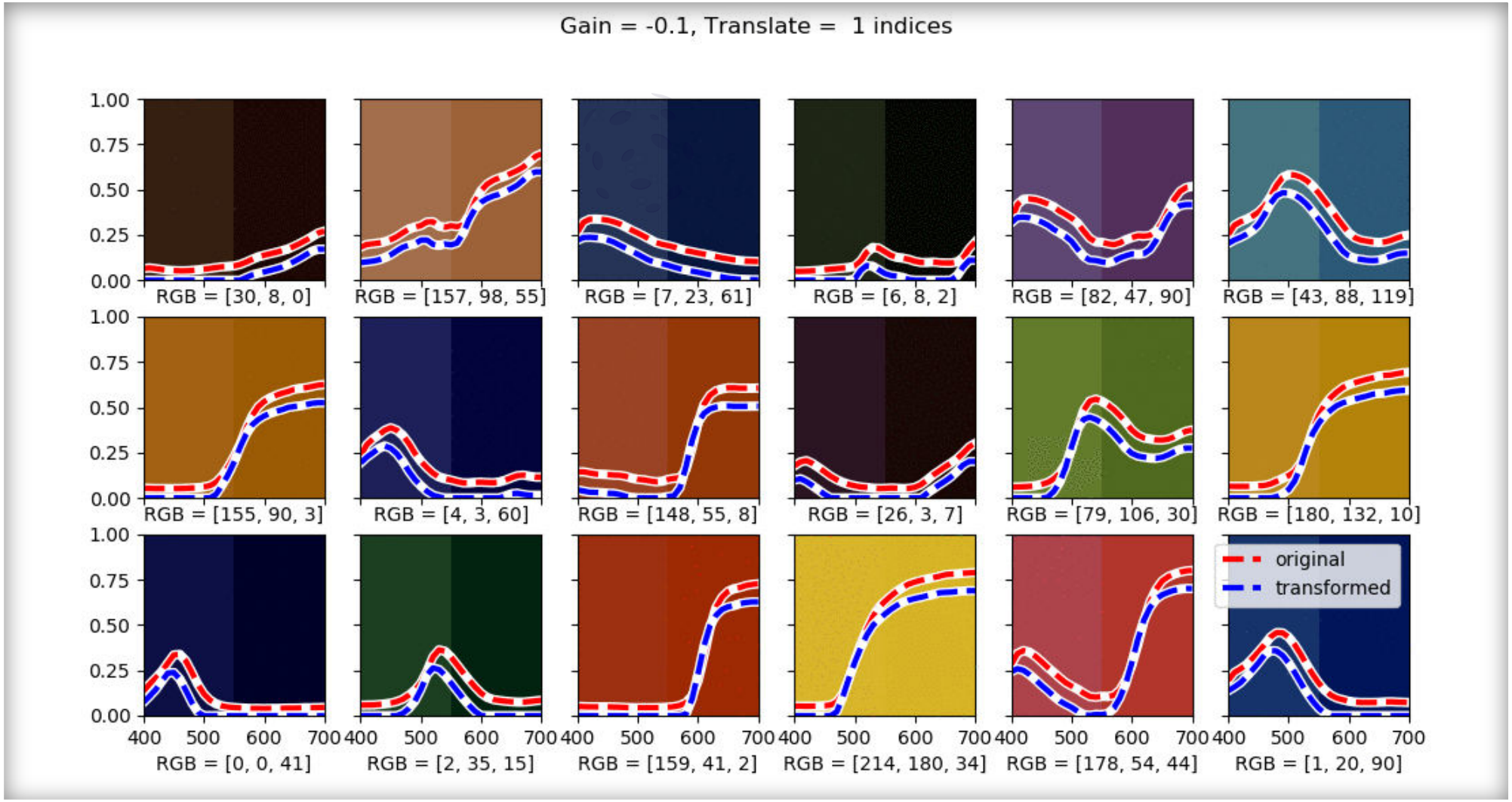
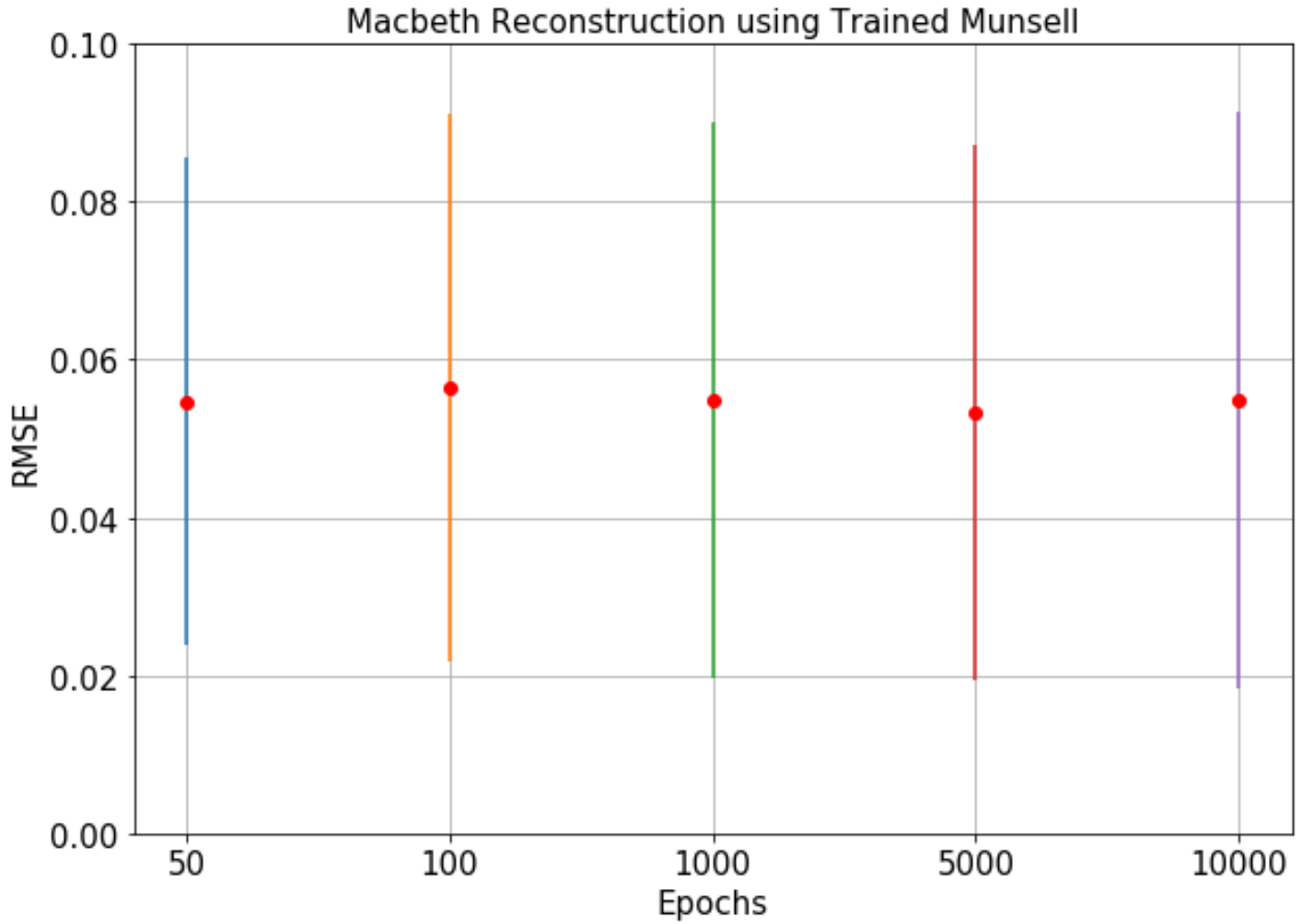
RGB = [27, 62, 32]
RGB = [155, 47, 16]
RGB = [216, 180, 42]
RGB = [173, 67, 74]
RGB = [23, 51, 107]
400
500
600
700
original
transformed


Original
RGB = [52, 30, 17]
RGB = [161, 110, 74]
RGB = [36, 51, 87]
RGB = [31, 36, 20]
RGB = [94, 70, 114]
RGB = [68, 115, 128]
RGB = [162, 96, 19]
RGB = [30, 31, 88]
RGB = [153, 67, 37]
RGB = [44, 20, 35]
RGB = [99, 123, 43]
RGB = [185, 135, 29]
RGB = [12, 15, 68]
RGB = [27, 62, 32]
RGB = [155, 47, 16]
RGB = [216, 180, 42]
RGB = [173, 67, 74]
RGB = [23, 51, 107]
original
transformed
1.00
0.75
0.50
0.25
0.00
400
500
600
700

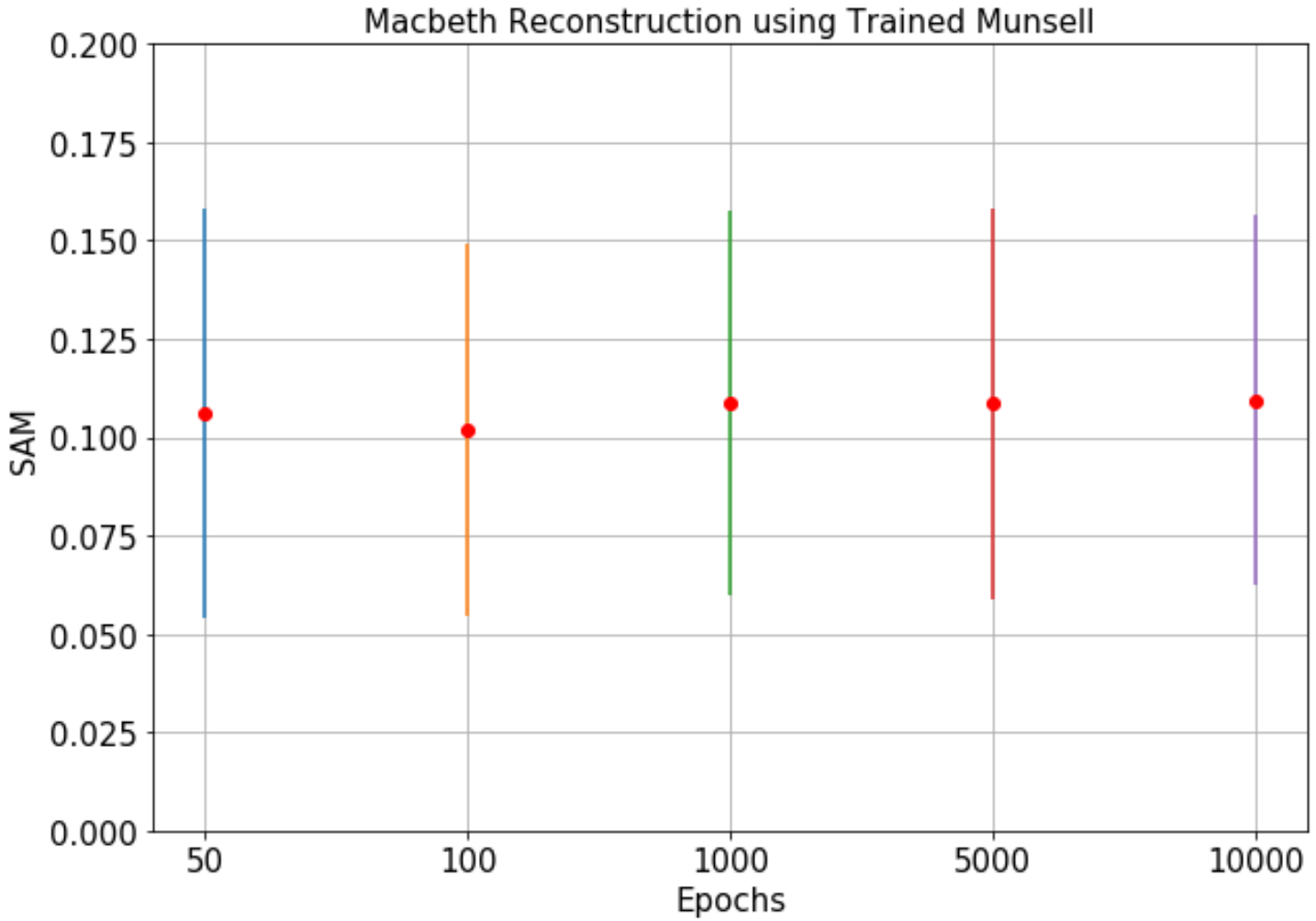

Gain = 0.1, Translate = 1 indices
RGB = [75, 55, 41]
RGB = [177, 130, 95]
RGB = [57, 70, 100]
RGB = [55, 58, 45]
RGB = [117, 89, 124]
RGB = [86, 122, 147]
RGB = [175, 123, 44]
RGB = [53, 52, 100]
RGB = [169, 95, 58]
RGB = [71, 45, 53]
RGB = [114, 136, 73]
RGB = [195, 156, 55]
RGB = [37, 38, 83]
RGB = [49, 78, 60]
RGB = [177, 77, 40]
RGB = [222, 195, 73]
RGB = [193, 95, 87]
RGB = [46, 65, 124]
original
transformed
1.00
0.75
0.50
0.25
0.00
400
500
600
700


Gain = -0.1, Translate = 1 indices
RGB = [30, 8, 0]
RGB = [157, 98, 55]
RGB = [7, 23, 61]
RGB = [6, 8, 2]
RGB = [82, 47, 90]
RGB = [43, 88, 119]
RGB = [155, 90, 3]
RGB = [4, 3, 60]
RGB = [148, 55, 8]
RGB = [26, 3, 7]
RGB = [79, 106, 30]
RGB = [180, 132, 10]
RGB = [0, 0, 41]
RGB = [2, 35, 15]
RGB = [159, 41, 2]
RGB = [214, 180, 34]
RGB = [178, 54, 44]
RGB = [1, 20, 90]
original
transformed

Model Evaluation (RMSE)

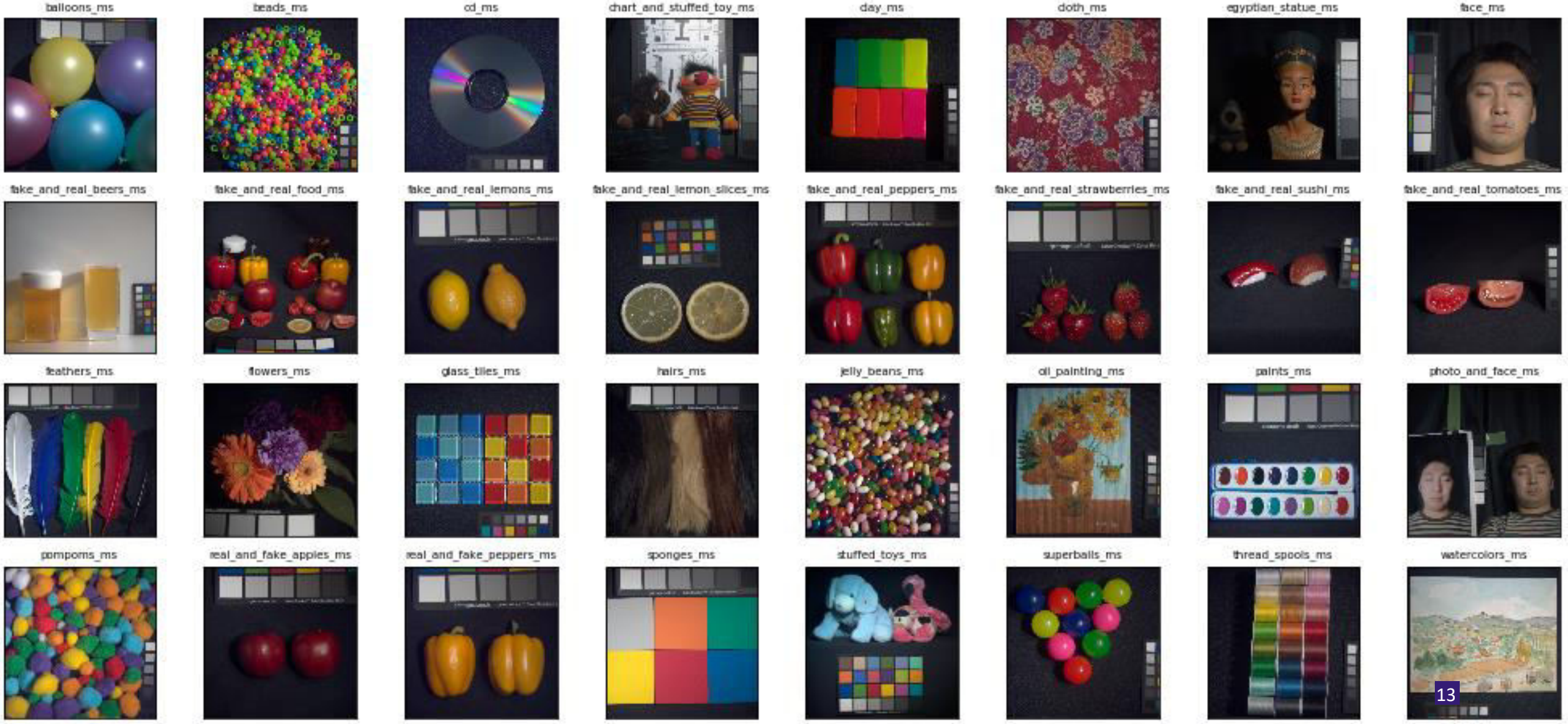


Model Evaluation (SAM)



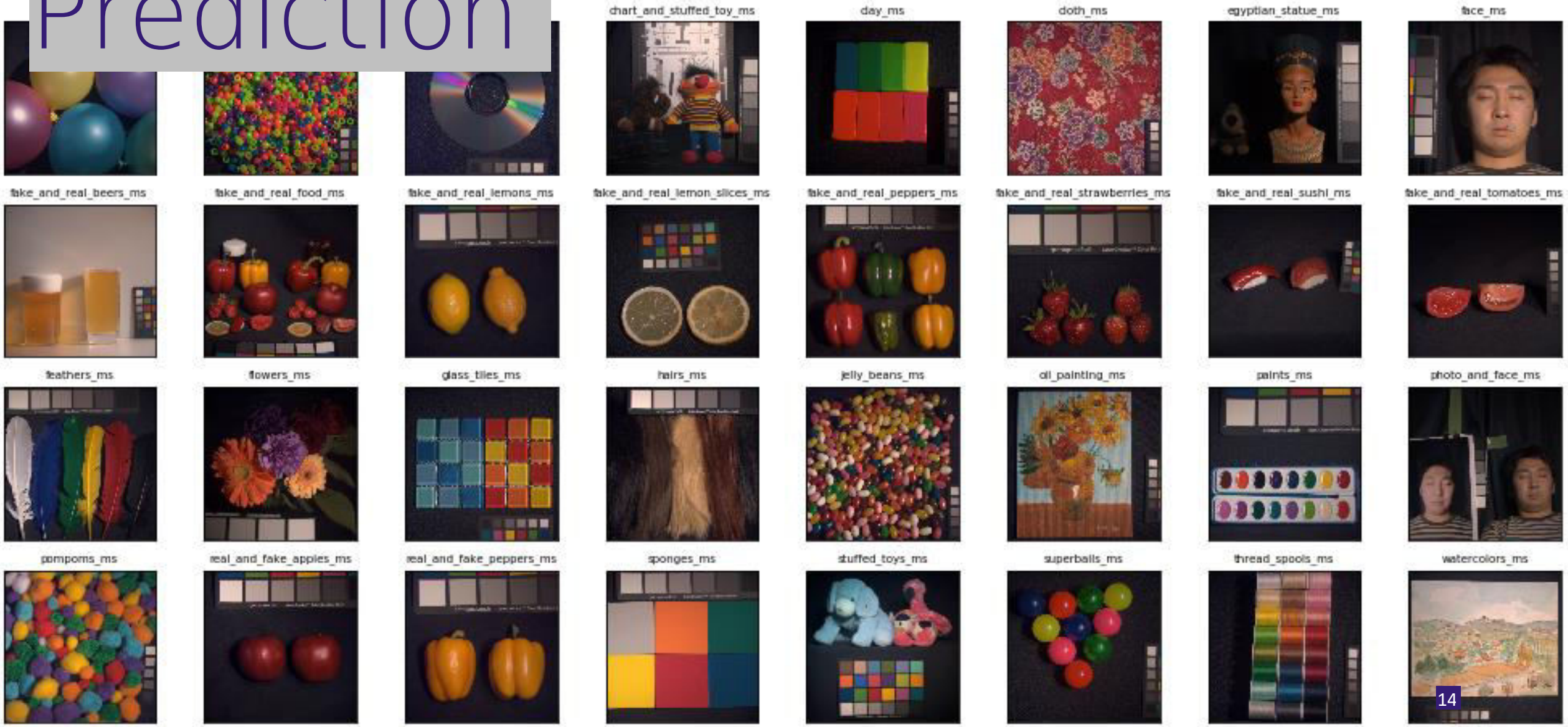
CAVE dataset

GB images

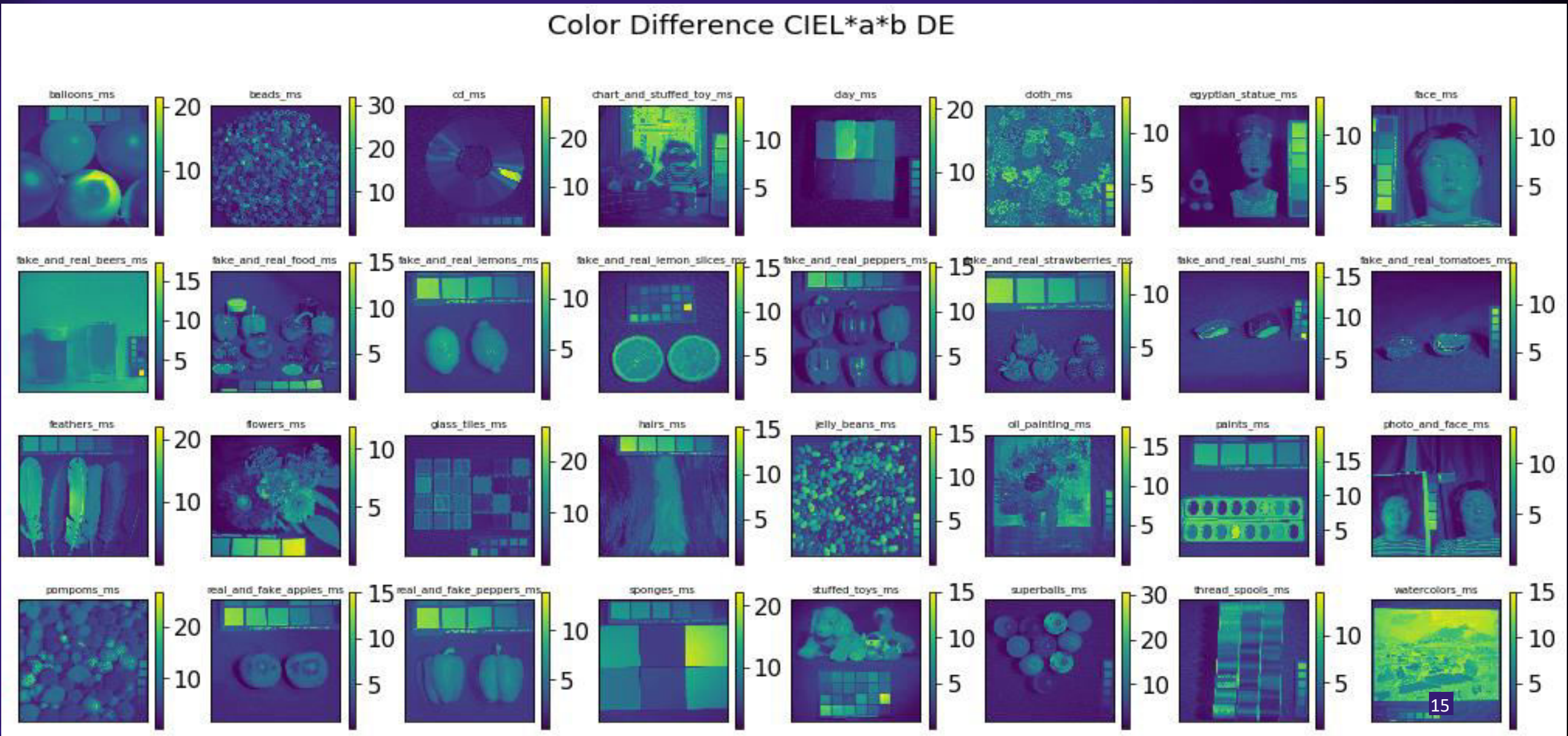
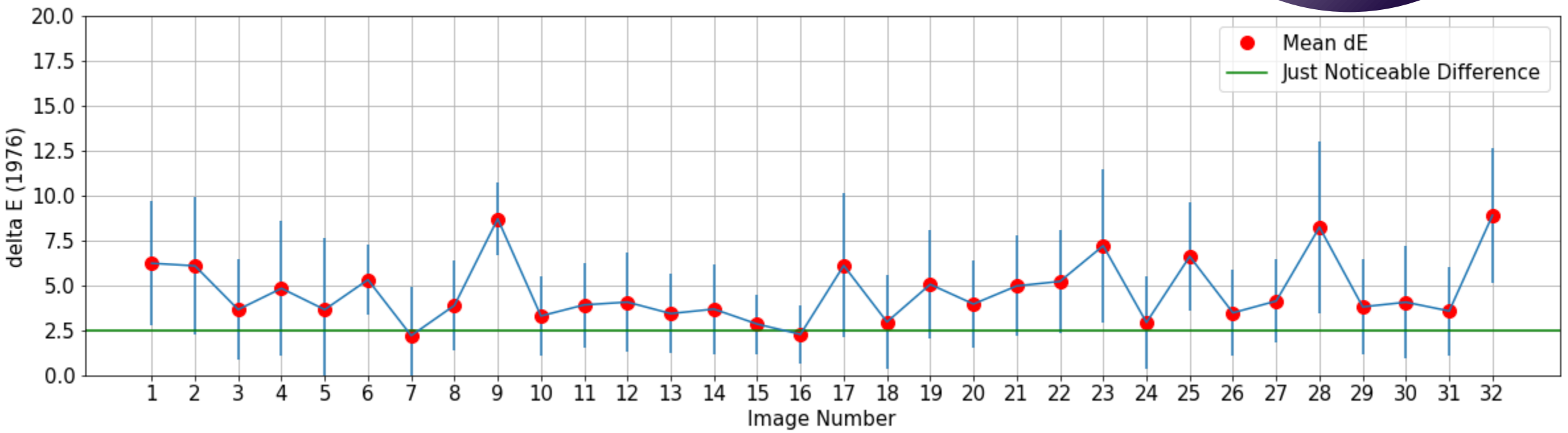


Rendering the Prediction

RGB images



EUCLIDEAN DISTANCE



average dE per test