

Finding Facial Forgery Artifacts with Parts-Based Detectors

Supplementary Material

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1. Full Data

Here we include more complete data from our experiments. Table 1 shows complete data for Table 1 in the full paper, Table 2 shows complete data for Table 3 in the full paper, and Table 3 shows complete data for Table 4 in the original paper.

For Table 1, the key difference is in the addition of the accuracy metric, computed as the average accuracy of real and fake computation. Since for each split there are the same number of real and fake images, the metric does not need to be re-balanced. Tables 2 and 3 contain the accuracy metric as well, but also include detailed AUC numbers per split which were not included in the full paper.

Model		DF Acc	F2F Acc	FS Acc	NT Acc	DF AUC	F2F AUC	FS AUC	NT AUC
ResNet50	DF	0.96	0.5	0.48	0.55	0.98	0.51	0.48	0.57
ResNet50 Block 2	DF	0.95	0.5	0.5	0.54	0.99	0.55	0.47	0.68
Xception	DF	0.97	0.51	0.5	0.58	0.98	0.52	0.49	0.61
Xception Block 2	DF	0.87	0.54	0.45	0.72	0.91	0.6	0.43	0.79
Nose	DF	0.87	0.57	0.41	0.74	0.97	0.63	0.33	0.81
Mouth	DF	0.82	0.55	0.44	0.7	0.94	0.56	0.48	0.76
Eyes	DF	0.88	0.54	0.49	0.74	0.96	0.6	0.4	0.84
Chin	DF	0.89	0.52	0.48	0.75	0.96	0.59	0.33	0.85
Eyes+Chin	DF	0.92	0.52	0.49	0.67	0.97	0.58	0.42	0.76
Combined	DF	0.9	0.51	0.5	0.67	0.97	0.62	0.39	0.83
ResNet50	F2F	0.56	0.97	0.51	0.53	0.57	0.98	0.5	0.56
ResNet50 Block 2	F2F	0.53	0.98	0.51	0.52	0.66	0.99	0.54	0.65
Xception	F2F	0.53	0.98	0.5	0.51	0.58	0.98	0.52	0.54
Xception Block 2	F2F	0.66	0.71	0.63	0.68	0.7	0.94	0.64	0.74
Nose	F2F	0.54	0.96	0.53	0.53	0.62	0.98	0.58	0.57
Mouth	F2F	0.51	0.94	0.55	0.49	0.53	0.98	0.65	0.52
Eyes	F2F	0.6	0.93	0.58	0.58	0.73	0.97	0.65	0.72
Chin	F2F	0.59	0.89	0.56	0.58	0.75	0.95	0.65	0.74
Eyes+Chin	F2F	0.5	0.94	0.53	0.48	0.56	0.98	0.62	0.48
Combined	F2F	0.68	0.87	0.52	0.71	0.76	0.95	0.53	0.77
ResNet50	FS	0.5	0.52	0.97	0.49	0.5	0.54	0.99	0.49
ResNet50 Block 2	FS	0.51	0.52	0.97	0.49	0.54	0.65	1	0.42
Xception	FS	0.5	0.54	0.98	0.5	0.51	0.58	0.99	0.5
Xception Block 2	FS	0.48	0.58	0.88	0.45	0.48	0.62	0.92	0.29
Nose	FS	0.51	0.53	0.96	0.49	0.53	0.56	0.98	0.47
Mouth	FS	0.48	0.59	0.8	0.34	0.45	0.63	0.96	0.22
Eyes	FS	0.51	0.52	0.96	0.49	0.53	0.64	0.98	0.45
Chin	FS	0.49	0.52	0.95	0.49	0.44	0.73	0.99	0.33
Eyes+Chin	FS	0.5	0.54	0.92	0.49	0.48	0.71	0.99	0.41
Combined	FS	0.54	0.55	0.93	0.44	0.52	0.56	0.98	0.32
ResNet50	NT	0.55	0.5	0.49	0.93	0.56	0.51	0.48	0.94
ResNet50 Block 2	NT	0.55	0.5	0.5	0.96	0.67	0.52	0.43	0.98
Xception	NT	0.55	0.57	0.5	0.98	0.59	0.6	0.5	1
Xception Block 2	NT	0.53	0.5	0.5	0.93	0.69	0.55	0.42	0.98
Nose	NT	0.52	0.51	0.5	0.98	0.54	0.51	0.5	0.98
Mouth	NT	0.52	0.51	0.5	0.95	0.64	0.63	0.54	0.99
Eyes	NT	0.54	0.5	0.5	0.97	0.64	0.53	0.47	0.99
Chin	NT	0.67	0.54	0.49	0.97	0.84	0.68	0.38	0.99
Eyes+Chin	NT	0.57	0.52	0.5	0.97	0.77	0.61	0.47	0.98
Combined	NT	0.52	0.5	0.5	0.96	0.66	0.62	0.53	0.98

Table 1. AUC for the ROC curves of the parts-based detectors for each of the four parts of the face, as well as for the combined detector. The second column indicates which split of FaceForensics++ was used to train the model, while the other columns show the performance on each of those splits. This is an extension of Table 1 in the full paper. Here we include both standard accuracy (percentage of correct detections in each class) and AUC of the ROC curve.

Model		DF Acc	F2F Acc	FS Acc	NT Acc	DF AUC	F2F AUC	FS AUC	NT AUC
FC	DF	0.92	0.51	0.49	0.56	0.98	0.57	0.49	0.63
Mean	DF	0.9	0.51	0.5	0.67	0.97	0.62	0.39	0.83
Max	DF	0.89	0.54	0.47	0.67	0.96	0.58	0.45	0.73
Ensemble	DF	0.93	0.53	0.46	0.72	0.98	0.61	0.41	0.83
FC	F2F	0.63	0.83	0.58	0.67	0.66	0.97	0.59	0.69
Mean	F2F	0.68	0.87	0.52	0.71	0.76	0.95	0.53	0.77
Max	F2F	0.63	0.87	0.62	0.56	0.72	0.96	0.69	0.65
Ensemble	F2F	0.54	0.96	0.53	0.53	0.77	0.99	0.68	0.74
FC	FS	0.51	0.56	0.95	0.48	0.49	0.59	0.98	0.43
Mean	FS	0.54	0.55	0.93	0.44	0.52	0.56	0.98	0.32
Max	FS	0.5	0.55	0.96	0.49	0.5	0.73	0.99	0.36
Ensemble	FS	0.51	0.53	0.96	0.49	0.5	0.62	0.99	0.33
FC	NT	0.55	0.51	0.49	0.95	0.59	0.55	0.48	0.98
Mean	NT	0.52	0.5	0.5	0.96	0.66	0.62	0.53	0.98
Max	NT	0.64	0.53	0.5	0.97	0.77	0.63	0.45	0.98
Ensemble	NT	0.52	0.51	0.5	0.98	0.76	0.6	0.42	0.99

Table 2. Different aggregation methods for the composite parts-based model. “Mean” is the method used in the rest of the paper which performs average pooling, “Max” performs max pooling, “FC” adds a fully connected layer, and “Ensemble” runs a separate network for each part, averaging the final logits. This is an extension of Table 3 in the full paper. Here we include both standard accuracy (percentage of correct detections in each class) and AUC of the ROC curve.

Model		DF Acc	F2F Acc	FS Acc	NT Acc	DF AUC	F2F AUC	FS AUC	NT AUC
0 Blocks	DF	0.83	0.54	0.42	0.68	0.93	0.55	0.32	0.75
1 Block	DF	0.9	0.51	0.5	0.67	0.97	0.62	0.39	0.83
2 Blocks	DF	0.91	0.53	0.46	0.7	0.96	0.6	0.41	0.79
0 Blocks	F2F	0.52	0.53	0.5	0.55	0.52	0.53	0.5	0.55
1 Block	F2F	0.68	0.87	0.52	0.71	0.76	0.95	0.53	0.77
2 Blocks	F2F	0.52	0.94	0.52	0.5	0.6	0.99	0.6	0.63
0 Blocks	FS	0.52	0.5	0.87	0.44	0.49	0.5	0.93	0.27
1 Block	FS	0.54	0.55	0.93	0.44	0.52	0.56	0.98	0.32
2 Blocks	FS	0.52	0.55	0.91	0.43	0.49	0.58	0.99	0.32
0 Blocks	NT	0.52	0.51	0.52	0.84	0.55	0.53	0.52	0.92
1 Block	NT	0.52	0.5	0.5	0.96	0.66	0.62	0.53	0.98
2 Blocks	NT	0.51	0.5	0.5	0.95	0.58	0.54	0.48	0.98

Table 3. Performance of the aggregated parts-based model, trained with different numbers of Xception blocks included after truncation. This is an extension of Table 4 in the full paper. Here we include both standard accuracy (percentage of correct detections in each class) and AUC of the ROC curve.