Generating Training Data for Denoising Real RGB Images via Camera Pipeline Simulation: Supplementary Material

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1. Additional Comparison Between AWGN Models and Ours

This section supplements results shown in Fig. 7 of the main paper. It incldues test results on the iPhone 8, the Pixel XL, and the Samsung Galaxy S7 test data.

| Ground Truth | Noisy Input | AWGN | AMWGN | Ours |
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AWGN Models vs Ours (Main Paper's Fig. 7): iPhone 8 Test Data

| AWGN Models vs Ours (Main Paper's Fig. 7): iPhone 8 Test Data | | | | | |
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| Ground Truth | Noisy Input | AWGN | AMWGN | Ours | |
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AWGN Models vs Ours (Main Paper's Fig. 7): Pixel XL Test Data

| Ground Truth | Noisy Input | AWGN | AMWGN | Ours |
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| AWGN Models vs Ours (Main Paper's Fig. 7): Pixel XL Test Data | | | | | | |
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AWGN Models vs Ours (Main Paper's Fig. 7): Pixel XL Test Data

AWGN Models vs Ours (Main Paper's Fig. 7): Samsung Galaxy S7 Test Data

| Ground Truth | Noisy Input | AWGN | AMWGN | Ours |
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| Ground Truth | Noisy Input | AWGN | AMWGN | Ours |
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AWGN Models vs Ours (Main Paper's Fig. 7): Samsung Galaxy S7 Test Data

| AWGN | AWGN Models vs Ours (Main Paper's Fig. 7): Samsung Galaxy S7 Test Data | | | | | | |
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| WGN Models vs Ours (Main Paper's Fig. | 7): Samsung Galaxy S7 Test Data |
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2. Additional Result from the Ablation Study

This section supplements results shown in Fig. 9 of the main paper. It incldues test results on the iPhone 8, the Pixel XL, and the Samsung Galaxy S7 test data.

The Effect of Disabling Components of Our Pipeline (Main Paper's Fig. 9): iPhone 8 Test Data

| Ground Truth | Noisy Input | Full Model | No Post-processing | No Denoising | No Demosaicking |
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| The | Effect of Disabling C | omponents of Our Pi | peline (Main Paper's Fi | g. 9): iPhone 8 Test | Data |
|--------------|-----------------------|---------------------|-------------------------|----------------------|-----------------|
| Ground Truth | Noisy Input | Full Model | No Post-processing | No Denoising | No Demosaicking |
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| Ground Truth | Noisy Input | Full Model | No Post-processing | No Denoising | No Demosaicking |
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The Effect of Disabling Components of Our Pipeline (Main Paper's Fig. 9): Pixel XL Test Data

| Ground Truth | Noisy Input | Full Model | No Post-processing | No Denoising | No Demosaicking |
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The Effect of Disabling Components of Our Pipeline (Main Paper's Fig. 9): Pixel XL Test Data

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The Effect of Disabling Components of Our Pipeline (Main Paper's Fig. 9): Samsung Galaxy S7 Test Data

| Ground Truth | Noisy Input | Full Model | No Post-processing | No Denoising | No Demosaicking |
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The Effect of Disabling Components of Our Pipeline (Main Paper's Fig. 9): Samsung Galaxy S7 Test Data

3. Additional Patches from Demosaicking Algorithm Study

This section supplements results shown in Fig. 10 of the main paper. It incldues test results on the iPhone 8, the Pixel XL, and the Samsung Galaxy S7 test data.



| Ground Truth | Noisy Input | Kodak[1] | AHD [2] | Bilinear |
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Comparison of Demosaicking Algorithm (Main Paper's Fig. 10): iPhone 8 Test Data

| Ground Truth | Noisy Input | Kodak[1] | AHD [2] | Bilinear |
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Comparison of Demosaicking Algorithm (Main Paper's Fig. 10): Pixel XL Test Data

| Comparison of Demosaicking Algorithm (Main Paper's Fig. 10): Pixel XL Test Data | | | | | | |
|---|--|----------|--|--|--|--|
| Ground Truth | Noisy Input | Kodak[1] | AHD [2] | Bilinear | | |
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| Comparison of | Demosaicking Algorit | hm (Main Paper's Fig | g. 10): Samsung Gala | xy S7 Test Data |
|-----------------------|----------------------------------|-------------------------------|---------------------------------|--------------------------------|
| Ground Truth | Noisy Input | Kodak[1] | AHD [2] | Bilinear |
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| Comparison of Demosaicking Algorithm (Main Paper's Fig. 10): Samsung Galaxy S7 Test Data | | | | | | |
|--|-------------|----------|---------|----------|--|--|
| Ground Truth | Noisy Input | Kodak[1] | AHD [2] | Bilinear | | |
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4. Additional Result from AWGN-trained Networks on Patches with AWGN

This section supplements results shown in Fig. 8 of the main paper. It shows that our AWGN-trained models are working correctly. We use clean patches from the iPhone 8, the Pixel XL, and the Samsung Galaxy S7 test data.





Testing AWGN Models on AWGN Patches (Main Paper's Fig. 8): iPhone 8 Test Data



Testing AWGN Models on AWGN Patches (Main Paper's Fig. 8): iPhone 8 Test Data



Testing AWGN Models on AWGN Patches (Main Paper's Fig. 8): Pixel XL Test Data



Testing AWGN Models on AWGN Patches (Main Paper's Fig. 8): Pixel XL Test Data



Testing AWGN Models on AWGN Patches (Main Paper's Fig. 8): Pixel XL Test Data



Testing AWGN Models on AWGN Patches (Main Paper's Fig. 8): Samsung Galaxy S7 Test Data



Testing AWGN Models on AWGN Patches (Main Paper's Fig. 8): Samsung Galaxy S7 Test Data



Testing AWGN Models on AWGN Patches (Main Paper's Fig. 8): Samsung Galaxy S7 Test Data

5. Additional Cellphone Simulation Results

This section supplements results shown in Fig. 4 in Section 3.2 of the main paper.



Matching Cellphone Camera Processing with Our Pipeline (Main Paper's Fig. 4): iPhone 7 Simulation











Matching Cellphone Camera Processing with Our Pipeline (Main Paper's Fig. 4): iPhone 8 Simulation



Matching Cellphone Camera Processing with Our Pipeline (Main Paper's Fig. 4): iPhone 8 Simulation

Matching Cellphone Camera Processing with Our Pipeline (Main Paper's Fig. 4): Samsung Galaxy S7 Simulation



Matching Cellphone Camera Processing with Our Pipeline (Main Paper's Fig. 4): Samsung Galaxy S7 SimulationCellphone's JPEGOur SimulationDifference Image

Matching Cellphone Camera Processing with Our Pipeline (Main Paper's Fig. 4): Samsung Galaxy S7 SimulationCellphone's JPEGOur SimulationDifference Image

References

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- [2] K. Hirakawa and T. W. Parks. Adaptive homogeneity-directed demosaicing algorithm. *IEEE Transactions on Image Processing*, 14(3):360–369, 2005. 14, 15, 16, 17, 18, 19