Supplementary file to "Learning Image-adaptive 3D Lookup Tables for High Performance Photo Enhancement in Real-time"

In this supplementary file, we provide more visual comparisons of the enhancement results obtained by different methods on a variety of input scenes. Specifically:

- Fig. 1 shows the enhancement results of different paired learning methods on the photo retouching task;

- Fig. 2 shows the enhancement results of different unpaired learning methods on the photo retouching task;

- Fig. 3 shows the enhancement results of different paired learning methods for imaging pipeline enhancement;

- Fig. 4 shows the enhancement results of different unpaired learning methods for imaging pipeline enhancement;

- Fig. 5 shows some less satisfied enhancement results of our 3D LUT model and the results by combining it with a local tone mapping operator;

- Fig. 6 compares the enhancement results obtained by HDRNet and our 3D LUT model on some challenging cases.

One can see that our 3D LUT method consistently obtains more stable and natural enhancement results on all the four tasks compared to the competing methods. However, our 3D LUT model may achieve less satisfied enhancement results in some scenes with very high dynamic range as shown in Fig. 5. The enhancement quality can be further improved by combining some local tone mapping algorithms with our 3D LUT model. The noise is also amplied in the last example shown in Fig. 5, which can be addressed by using some denoising module. In some challenging cases shown in Fig. 6, HDRNet may achieve slightly better local contrast in the dark area, while our 3D LUT model preserves more details in the highlight area and results in more natural color cast.

| Input | UPE | Dis-Rec | DPE | HDRNet | Ours | Target |

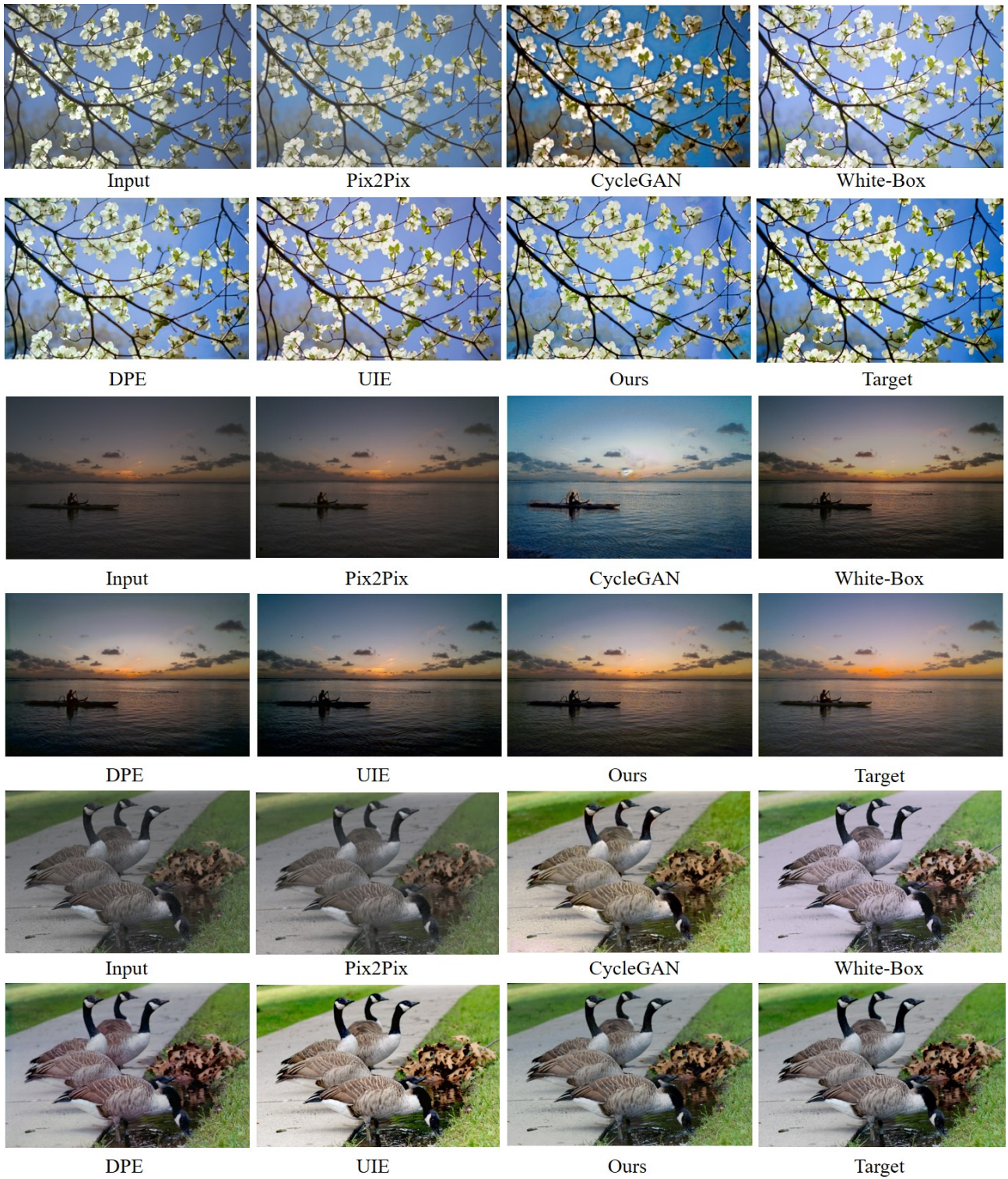Figure 1: Qualitative comparison of different paired learning methods on the photo retouching task.

Figure 2: Qualitative comparison of different unpaired learning methods on the photo retouching task.
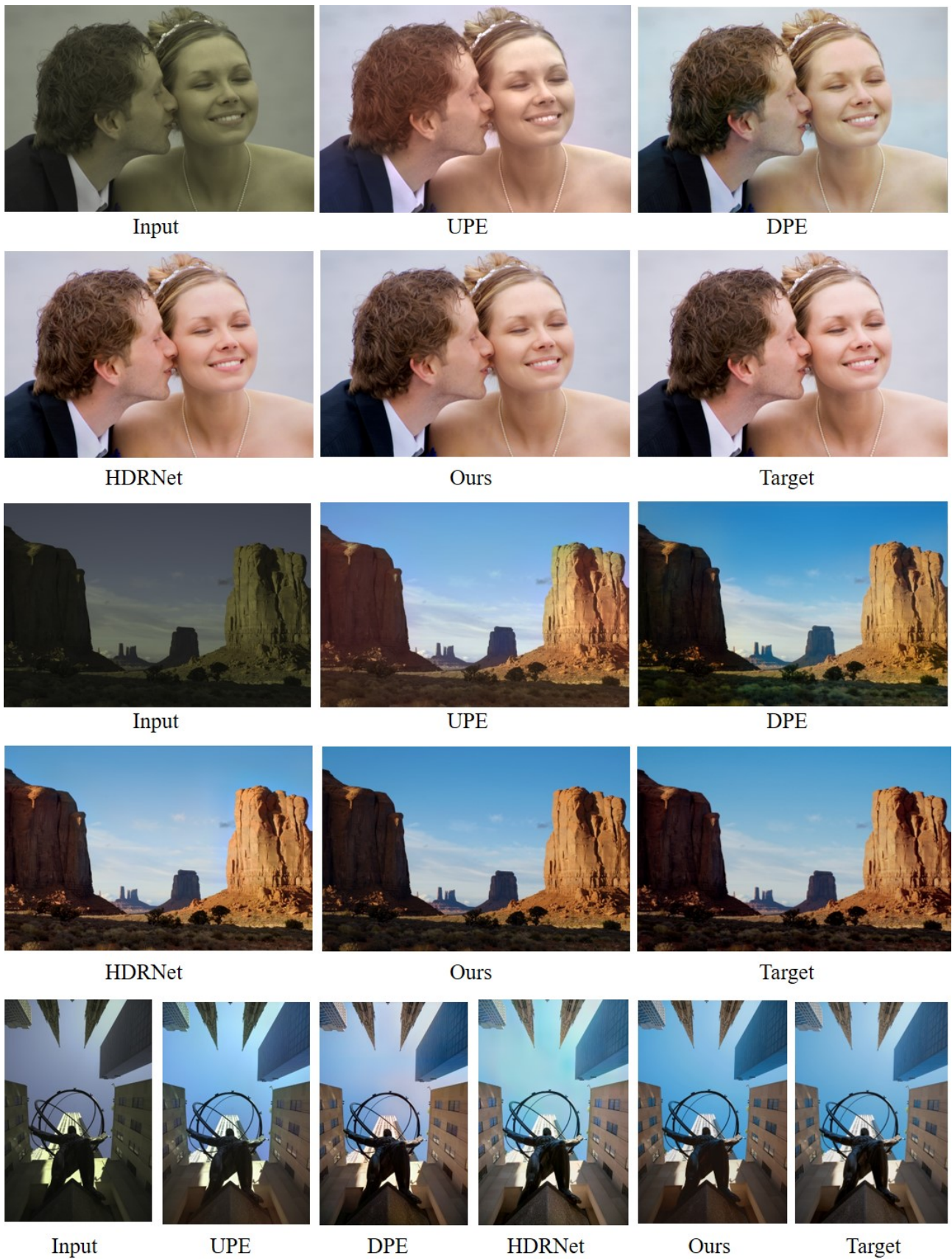
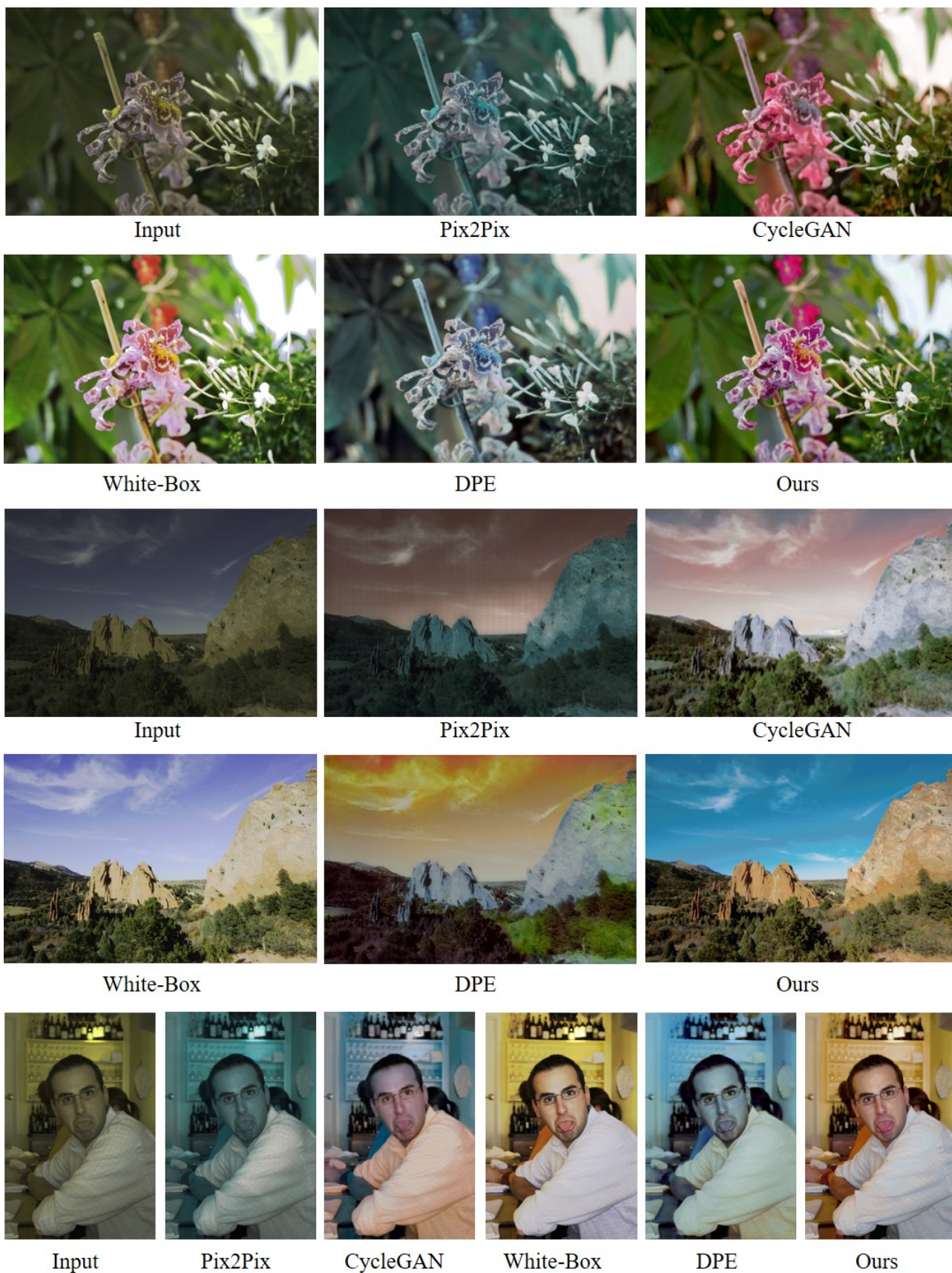Figure 3: Qualitative comparison of different paired learning methods for imaging pipeline enhancement.

Figure 4: Qualitative comparison of different unpaired learning methods for imaging pipeline enhancement.

| Input | 3D LUT | Local tone mapping | Local tone mapping + 3D LUT |

Figure 5: Less satisfied enhancement results of our 3D LUT model. Our model effectively enhances the global color and tone, while the local contrast in the dark areas can be further improved by combining it with some local tone mapping operator. The noise is also amplied in the last example, which can be addressed using some denoising module.
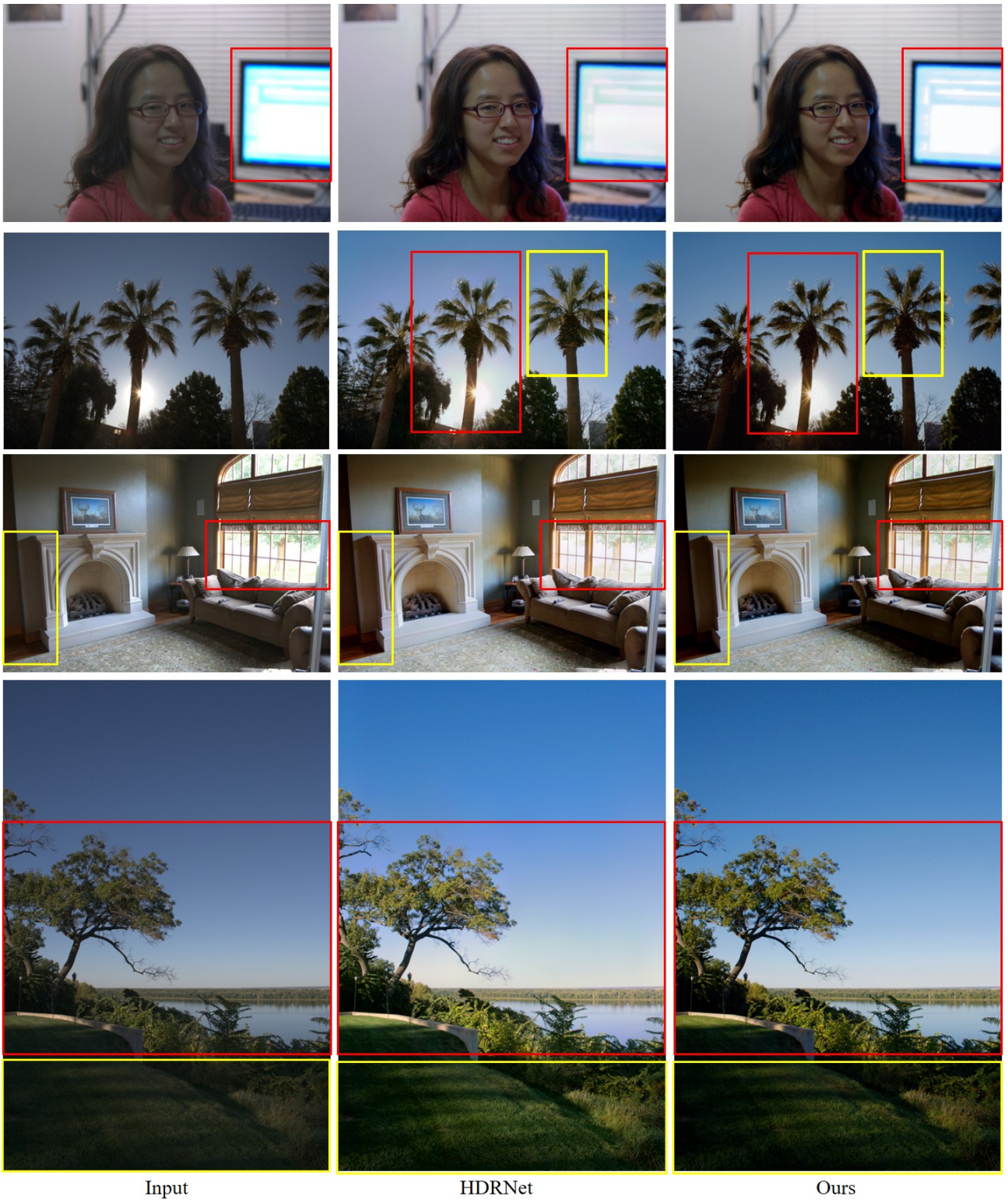
| Input | HDRNet | Ours |

Figure 6: Qualitative comparison of the enhancement results of HDRNet and our 3D LUT model on the paired photo retouching task.