Removing Raindrops and Rain Streaks in One Go
Supplementary Materials

1. Additional Quantitative Results

In this supplementary material, we also provide additional quantitative results on another large synthetic deraining dataset, namely Rain1200 [12]. Rain1200 contains 12,000 pairs of images for training, where the number of images with light, medium and heavy rain is all 4,000. Moreover, 1,200 synthetic image pairs are used for testing as well. As indicated by Table 1, our method still outperforms the state-of-the-art methods on Rain1200.

Benefiting from our newly proposed dataset, we are able to apply intermediate supervisions to our RSR and RDR blocks in training. Here, we remove those intermediate supervisions and only employ the final rain-free images as our objective, marked CCN w/o ISV, to dissect the importance of the intermediate supervision. As seen in Table 2, without the intermediate supervision, the performance decreases dramatically. The visual results of this baseline are shown in Figure 6. This ablation study also indicates that our superior deraining performance significantly benefits from our complementary learning fashion and proposed dataset.

In our CCN, RSR and RDR blocks only share architectures but not weights. In Table 2, we let different RSR and RDR blocks share weights, named CCN w SHARE. As expected, the performance of CCN w SHARE is inferior to CCN. This is because sharing weights do not facilitate learning complementary deraining information. Furthermore, the visual results of this baseline model are illustrated in Figure. 6.

2. Additional Qualitative Results

Here, we provide more visual results of our method as well as other approaches in Figure 2, Figure 1, Figure 3, Figure 5 and Figure 4. Figure 2, Figure 1 and Figure 3 illustrate the results of rain streak removal and Figure 5 shows the results of raindrop removal on synthetic data. It can be clearly seen that our method achieves not only higher PSNR and SSIM scores but also clearer derained results compared to the state-of-the-art. In Figure 4, our method removes real rain images, thus demonstrating the generalization ability of our model. Note that, all the methods are trained on the same dataset and then test on the same data.

Table 1: Quantitative comparisons with the state-of-the-art methods on Rain1200 [12].

Methods	Rain1200	
	PSNR	SSIM
DerainNet [2]	23.38	0.835
DDN [3]	27.33	0.898
JORDER [11]	24.32	0.862
DID-MDN [12]	27.95	0.908
DualCNN [7]	23.38	0.787
RESCAN [5]	29.95	0.884
SPANet [10]	28.64	0.910
PreNet [9]	31.36	0.911
MSPFN [4]	32.39	0.916
CCN	**32.97**	**0.921**

Table 2: Ablation studies of our network on RainDS-Syn.

RainDS-Syn	RS	RD	RDS
	PSNR/SSIM	PSNR/SSIM	PSNR/SSIM
CCN w/o ISV	27.72/0.87	21.05/0.77	20.46/0.61
CCN w SHARE	29.79/0.89	23.25/0.80	22.71/0.73
CCN	**35.12/0.97**	**33.29/0.97**	**32.16/0.95**

As shown in Figure 6, we also demonstrate the visual results of our baseline models in Table 5 of the main paper.

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Figure 1: Visual comparisons with the state-of-the-art methods DRD-Net [1] and PReNet [9] on Rain200H [11]. (Best view on screen)

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Figure 2: Visual comparisons with the state-of-the-art methods DRD-Net [1] and PReNet [9] on Rain200L [11]. (Best view on screen)

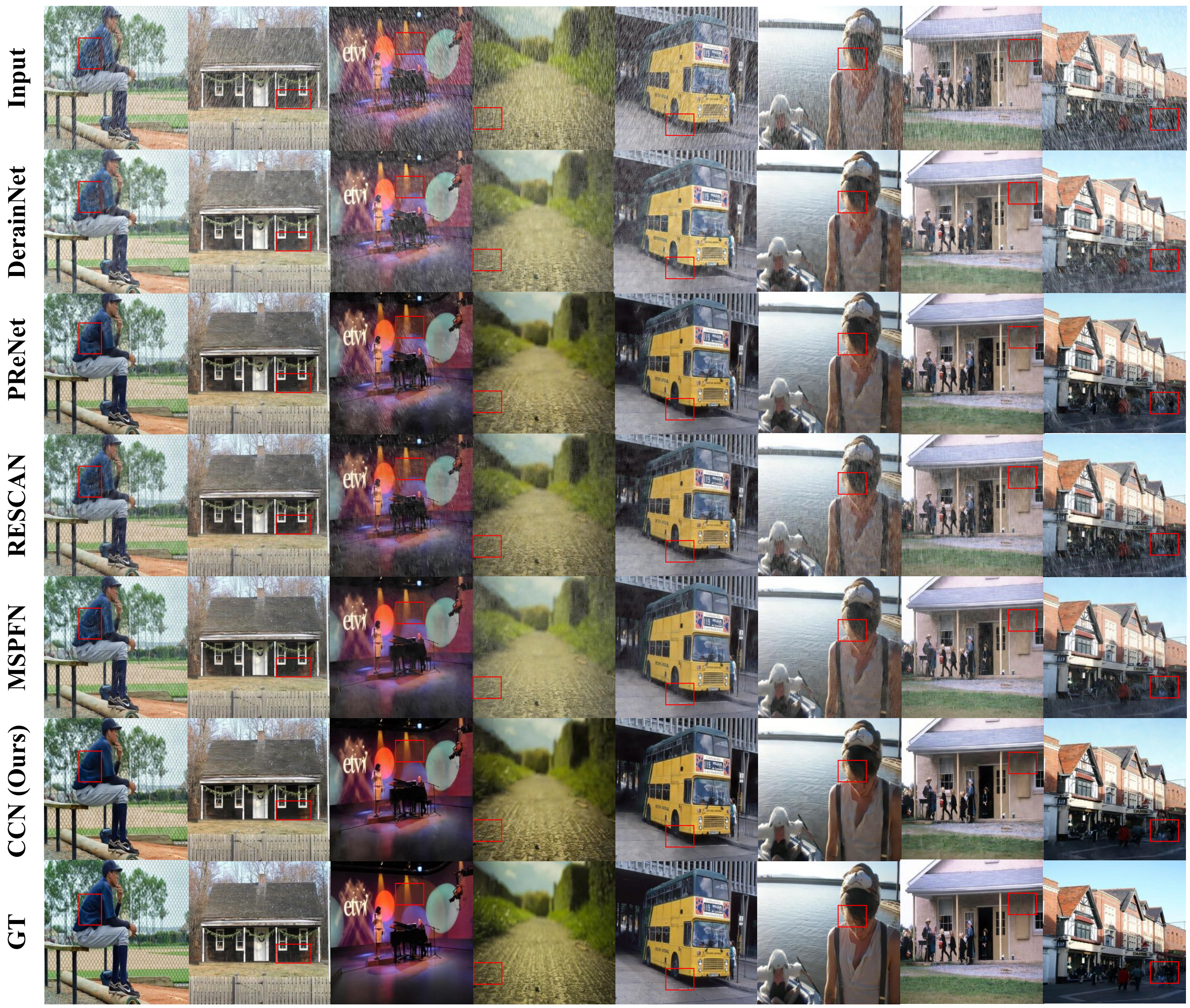

Figure 3: Visual comparisons with the state-of-the-art methods DerainNet [2], PReNet [9], RESCAN [5] and MSPFN [4] on Rain1200 [12].(Best view on screen)

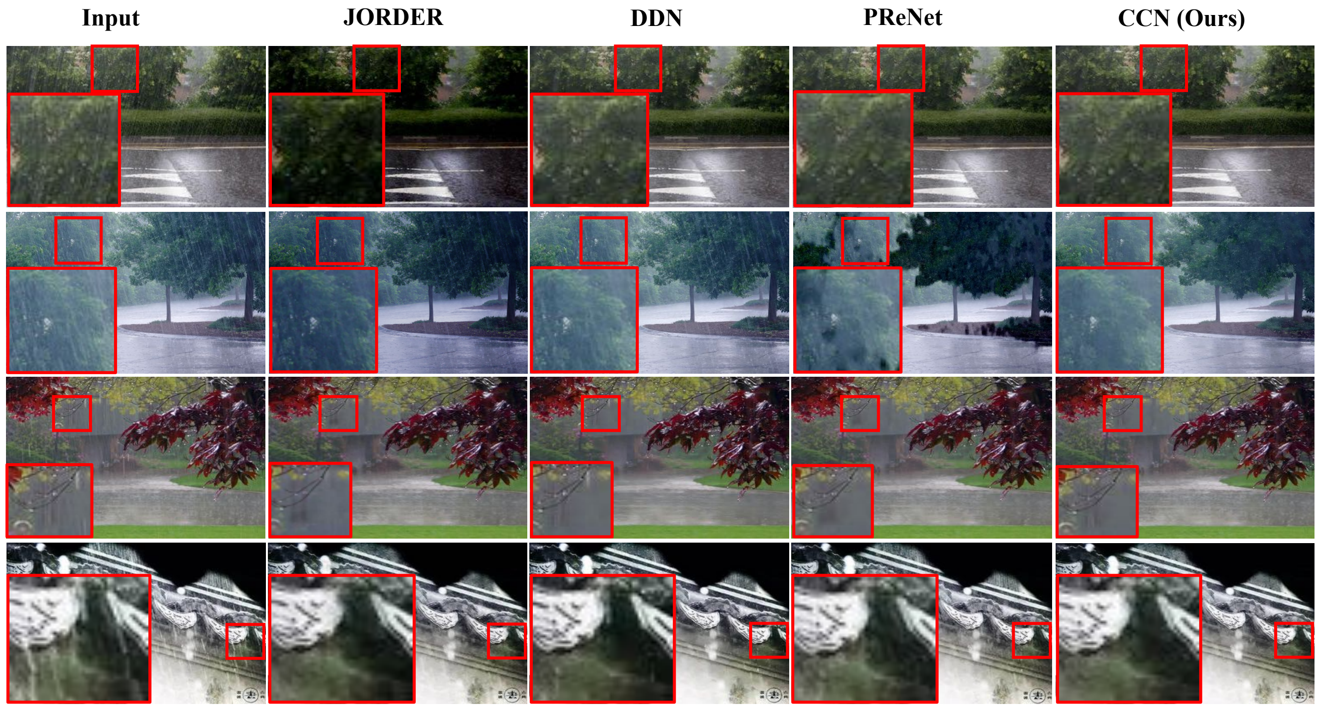

Figure 4: Visual quality comparisons with the state-of-the-art methods JORDER [11], DDN [3], and PReNet [9] on real rainy images [6].

Figure 5: Visual comparisons with the state-of-the-art method AttentGAN [8] on the RainDrop dataset.

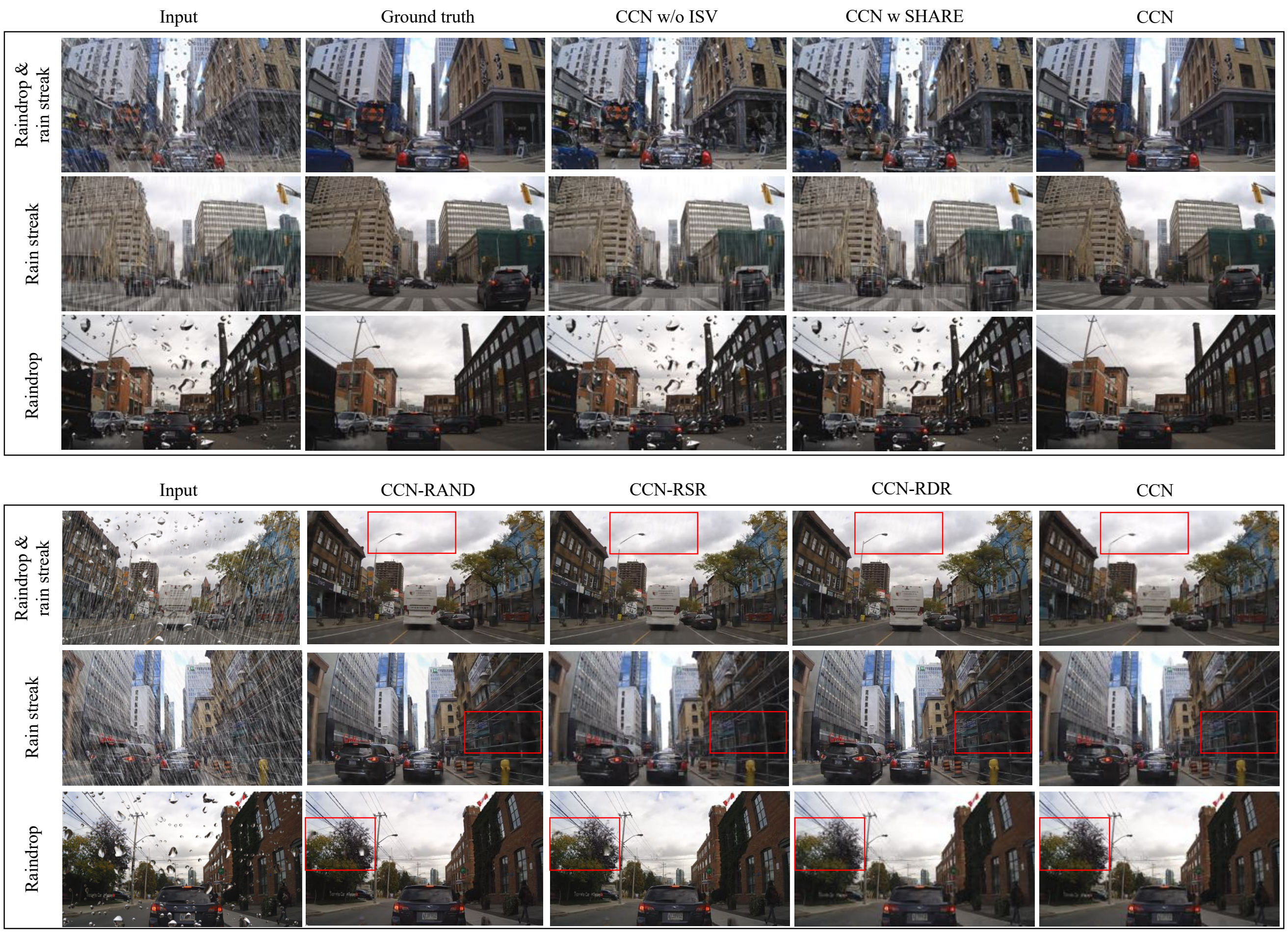

Figure 6: Visual comparisons of our baseline models on our proposed dataset RainDS-Syn.