Beyond High-Definition Super-resolution: Benchmarking Ultra-High-Definition Image Super-resolution

Anonymous ICCV submission

Paper ID 5467

In this supplementary material, we present more results of super-resolution in the case of different upsampling factors in Figure 1-10. Based on the results, we have the following findings.

- For 4K image SR with the scale factor of $2\times$, the method of bicubic interpolation can achieve similar performance as the state-of-the-art SR methods in terms of visual quality. The reason might be that the downsampled 2K HD images from 4K HR images still provide rich information as shown in Figure 5. For 8K image SR, the results of bicubic interpolation are similar to those of the current SR methods with $2\times$ and $3\times$ factors.
- The performance of bicubic interpolation is worse than the current state-of-the-art SR methods in the settings of the $3\times$ for 4K image SR. However, it is also difficult to find the difference between different SR methods based on the results of Figure 3 and 4. The reason is that the given LR images with $3\times$ and $4\times$ scale factors are still of high resolution, it is relatively easy for the state-of-the-art SR methods to super-resolve LR images to 4K images. For 8K image SR, the performance of bicubic interpolation is worse than the state-of-the-art SR methods in terms of the $4\times$ setting.
- For 4K image SR, it is easy to observe the performance variation between the state-of-the-art SR methods with $8\times$ and $16\times$ settings. While for 8K image SR, the performance variation among different methods is significant with the $16\times$ setting.

References

[1] Saeed Anwar and Nick Barnes. Densely residual laplacian super-resolution. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 2020. 2, 3, 4, 5, 6, 7, 8, 9, 10, 11

[2] Chao Dong, Chen Change Loy, Kaiming He, and Xiaoou Tang. Learning a deep convolutional network for image super-resolution. In *European Conference on Computer Vision*, 2014. 2, 3, 4, 5, 6, 7, 8, 9, 10, 11

[3] Ben Niu, Weilei Wen, Wenqi Ren, Xiangde Zhang, Lianping Yang, Shuzhen Wang, Kaihao Zhang, Xiaochun Cao, and Haifeng Shen. Single image super-resolution via a holistic attention network. In *European Conference on Computer Vision*, 2020. 2, 3, 4, 5, 6, 7, 8, 9, 10, 11

[4] Yulun Zhang, Kunpeng Li, Kai Li, Lichen Wang, Bineng Zhong, and Yun Fu. Image super-resolution using very deep residual channel attention networks. In *European Conference on Computer Vision*, 2018. 2, 3, 4, 5, 6, 7, 8, 9, 10, 11

[5] Yulun Zhang, Yapeng Tian, Yu Kong, Bineng Zhong, and Yun Fu. Residual dense network for image super-resolution. In *IEEE Conference on Computer Vision and Pattern Recognition*, 2018. 2, 3, 4, 5, 6, 7, 8, 9, 10, 11

ICCV #5467

1. Visual Results on the CityWalk4K Dataset with $16\times$ Setting

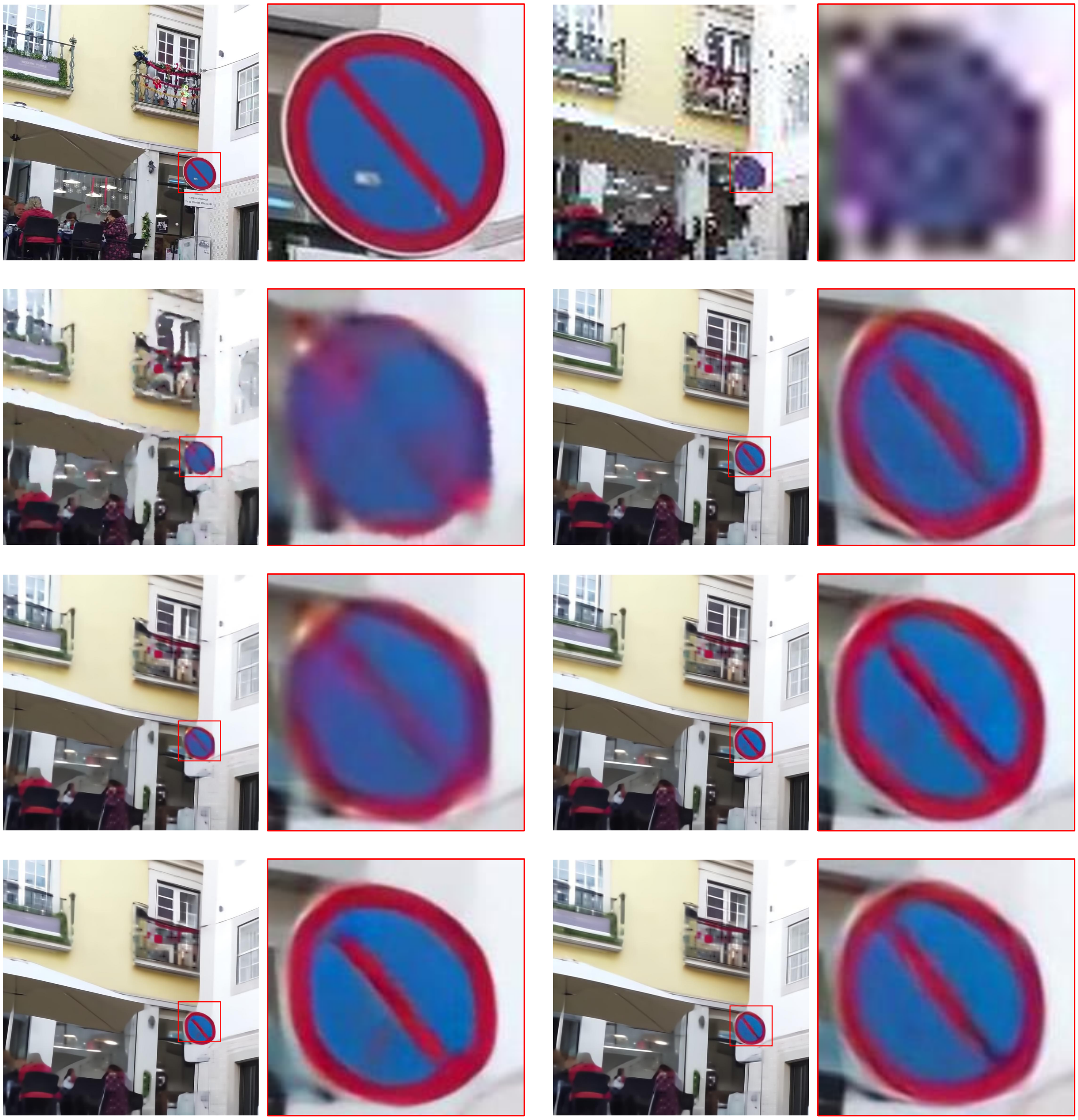

Figure 1. From top to bottom, left to right: HR, results of bicubic, SRCNN [2], RCAN [4], RDN [5], HAN [3], DRLN [1] and ours.

2. Visual Results on the CityWalk4K Dataset with $8\times$ Setting

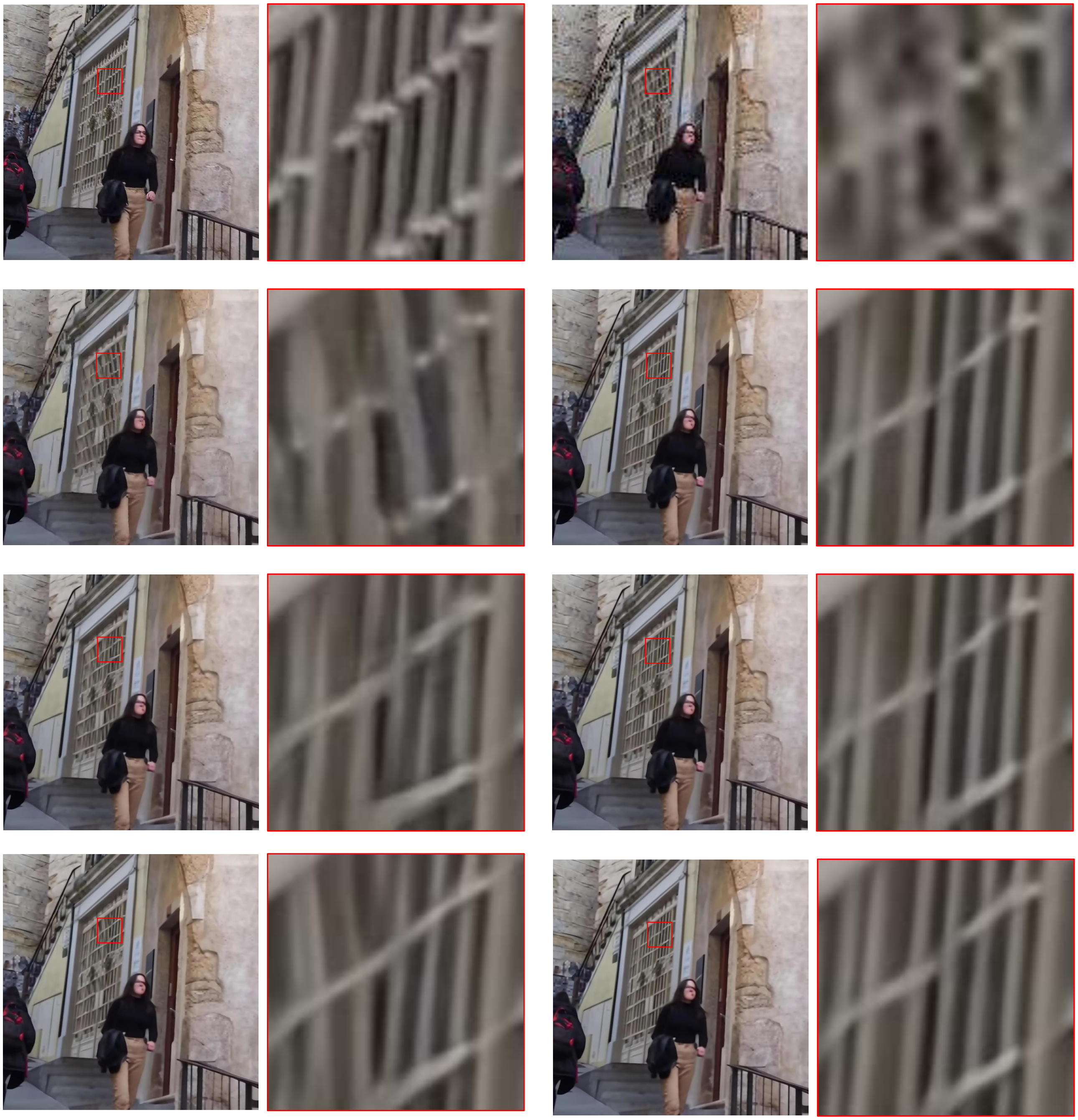

Figure 2. From top to bottom, left to right: HR, results of bicubic, SRCNN [2], RCAN [4], RDN [5], HAN [3], DRLN [1] and ours.

3. Visual Results on the CityWalk4K Dataset with $4\times$ Setting

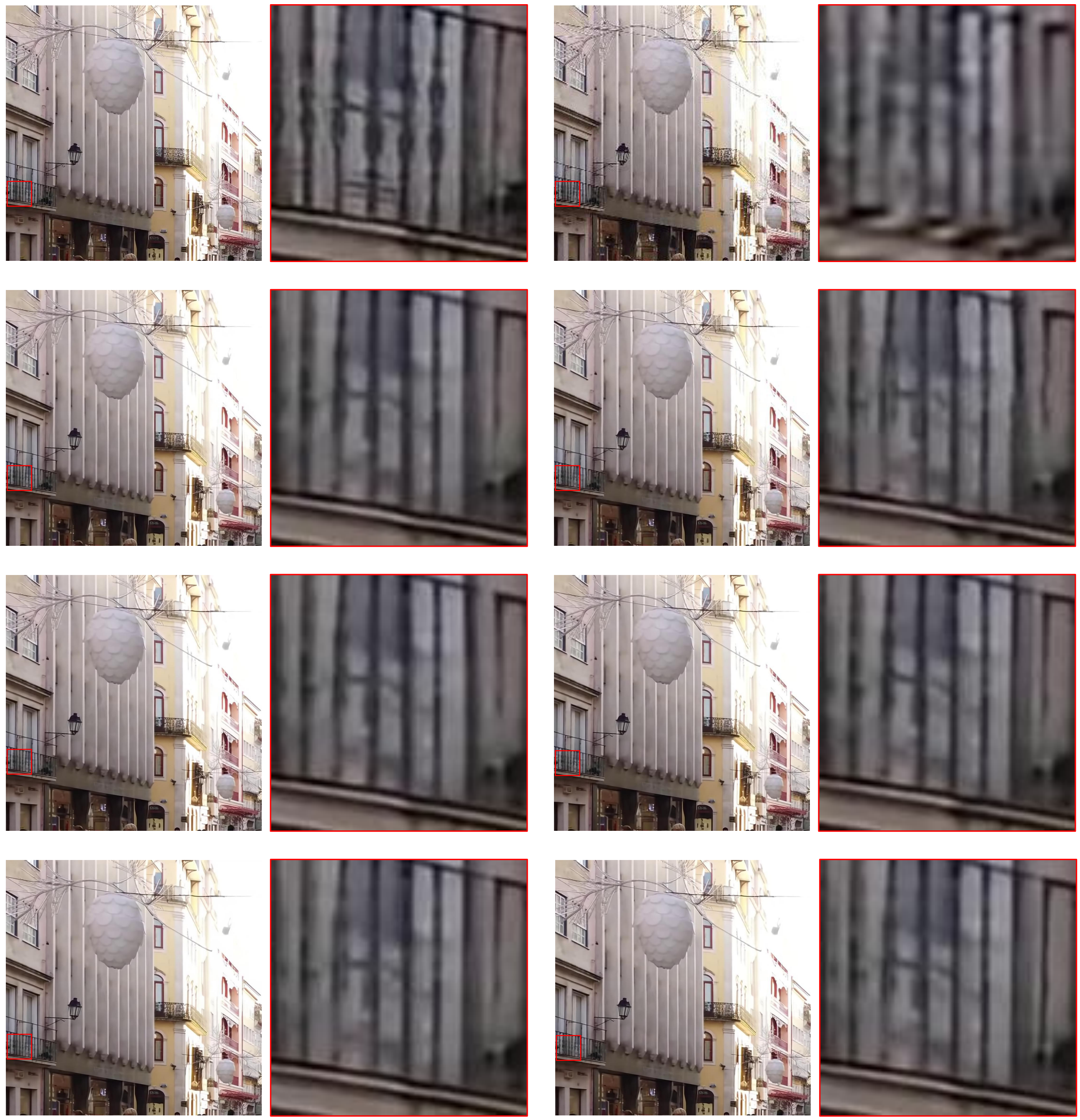

Figure 3. From top to bottom, left to right: HR, results of bicubic, SRCNN [2], RCAN [4], RDN [5], HAN [3], DRLN [1] and ours.

4. Visual Results on the CityWalk4K Dataset with $3\times$ Setting

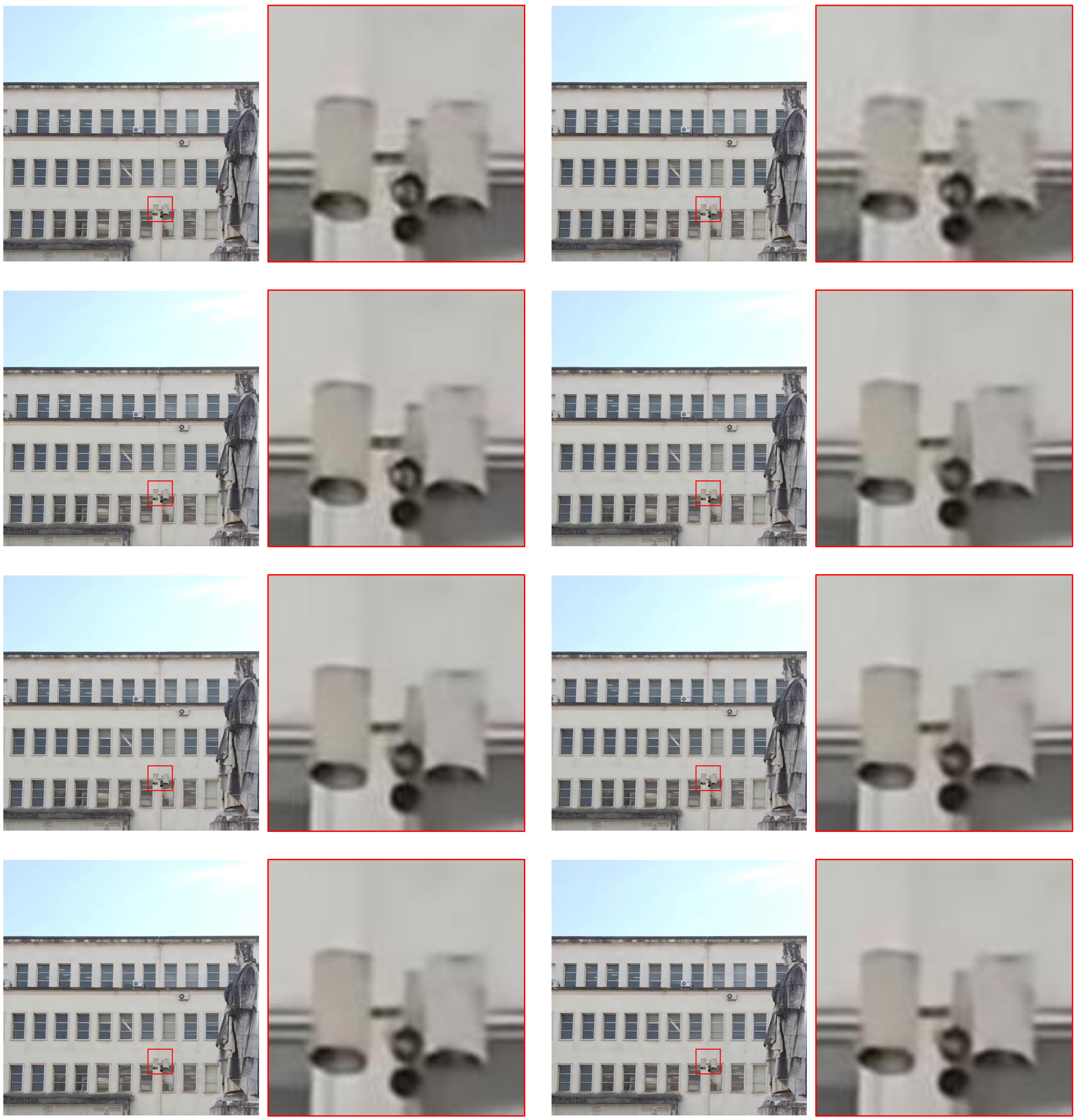

Figure 4. From top to bottom, left to right: HR, results of bicubic, SRCNN [2], RCAN [4], RDN [5], HAN [3], DRLN [1] and ours.

5. Visual Results on the CityWalk4K Dataset with $2\times$ Setting

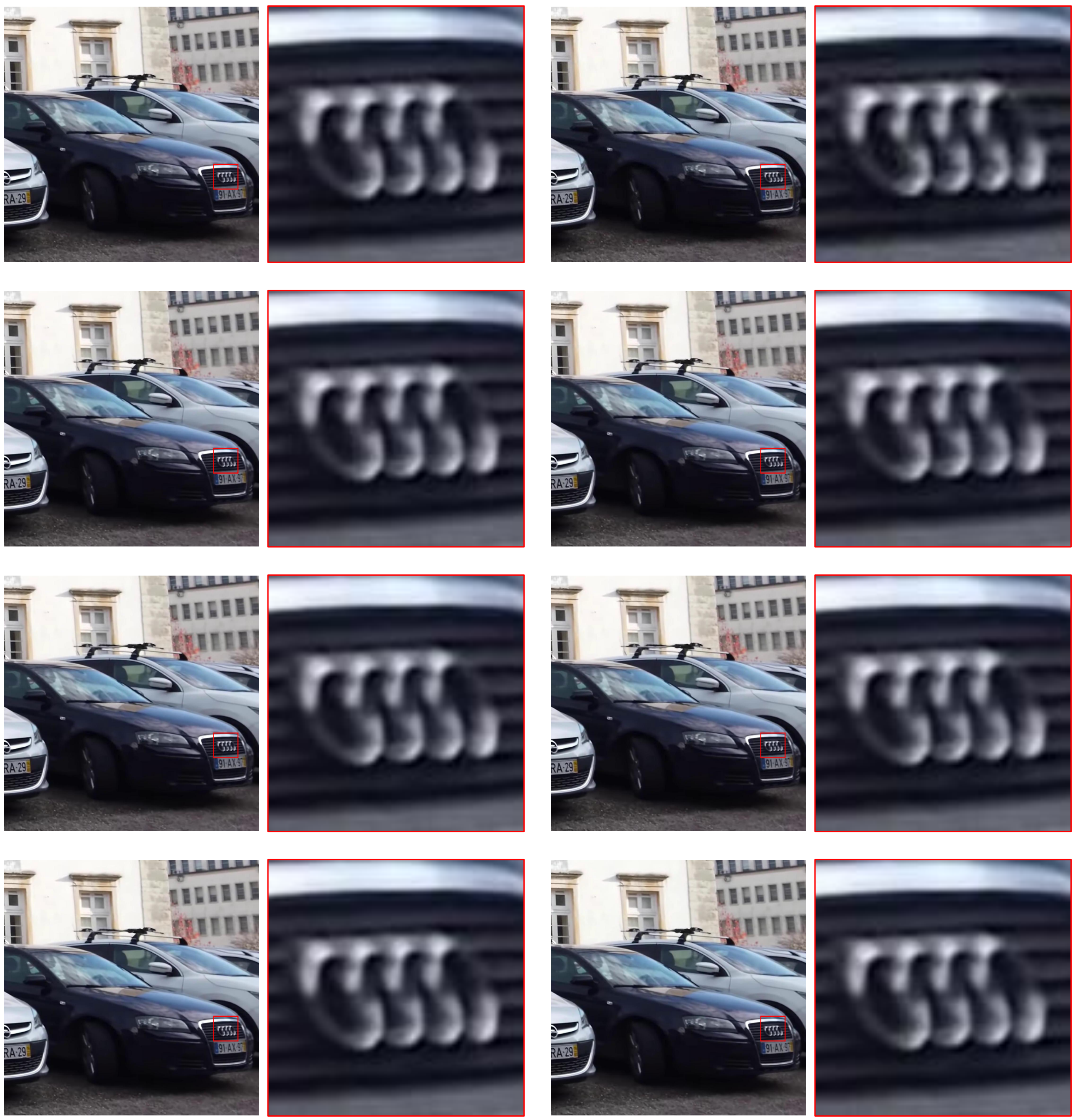

Figure 5. From top to bottom, left to right: HR, results of bicubic, SRCNN [2], RCAN [4], RDN [5], HAN [3], DRLN [1] and ours. For 4K UHD SR with the scale factor of $2\times$, the method of bicubic interpolation can achieve similar performance as the state-of-the-art SR methods.

ICCV #5467

6. Visual Results on the CityWalk8K Dataset with $16\times$ Setting

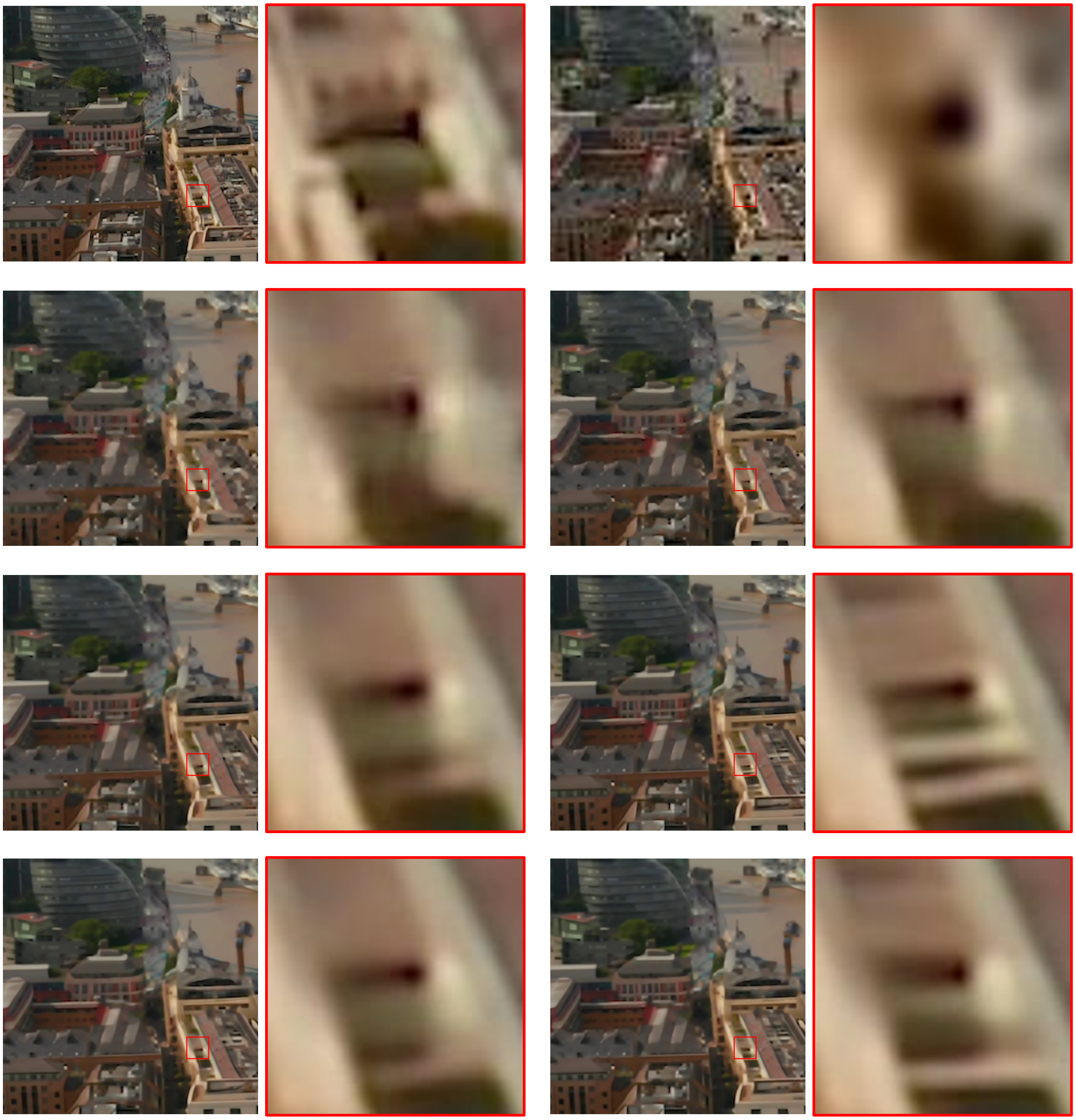

Figure 6. From top to bottom, left to right: HR, results of bicubic, SRCNN [2], RCAN [4], RDN [5], HAN [3], DRLN [1] and ours.

ICCV #5467

7. Visual Results on the CityWalk8K Dataset with $8\times$ Setting

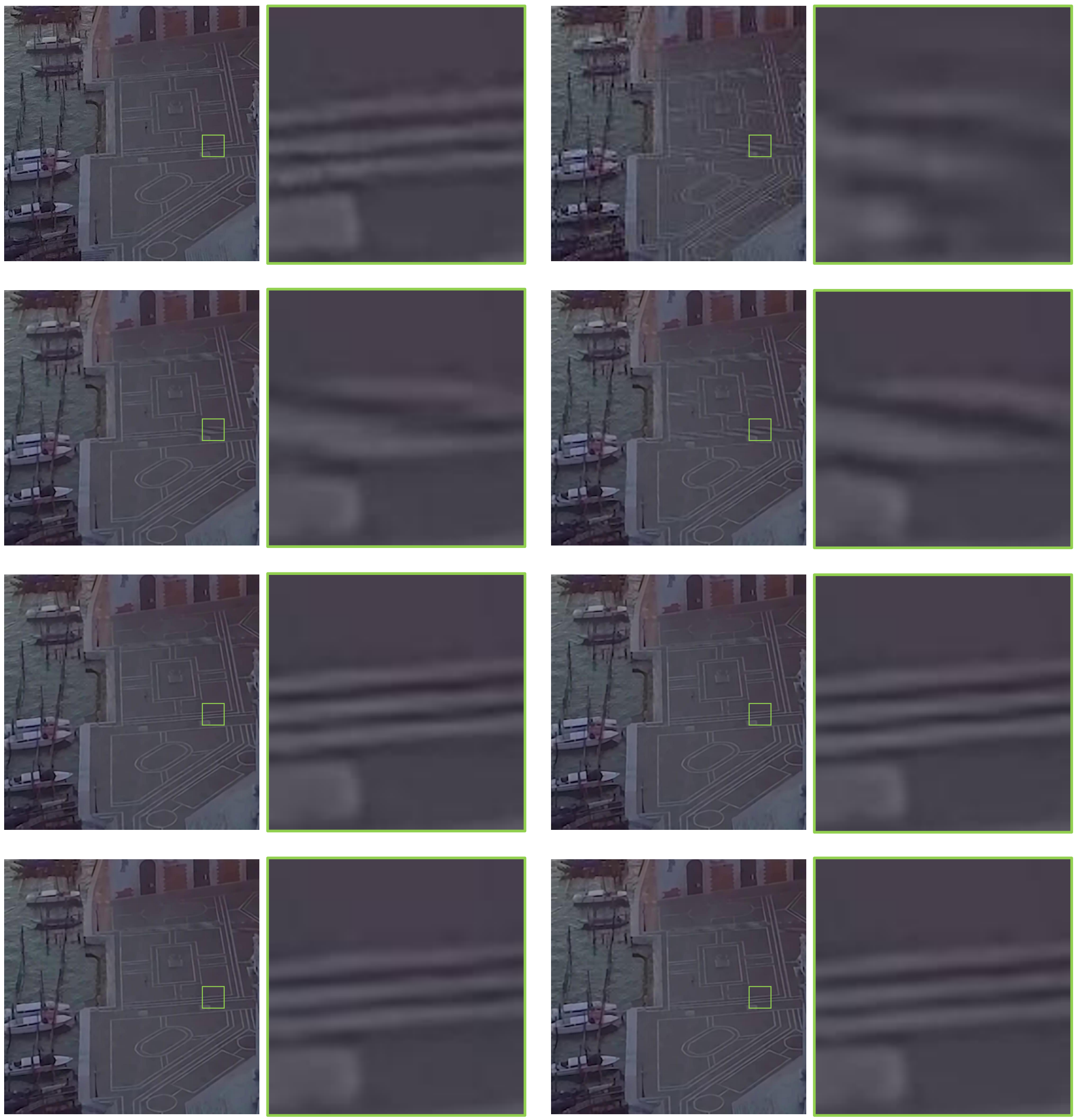

Figure 7. From top to bottom, left to right: HR, results of bicubic, SRCNN [2], RCAN [4], RDN [5], HAN [3], DRLN [1] and ours.

8. Visual Results on the CityWalk8K Dataset with $4\times$ Setting

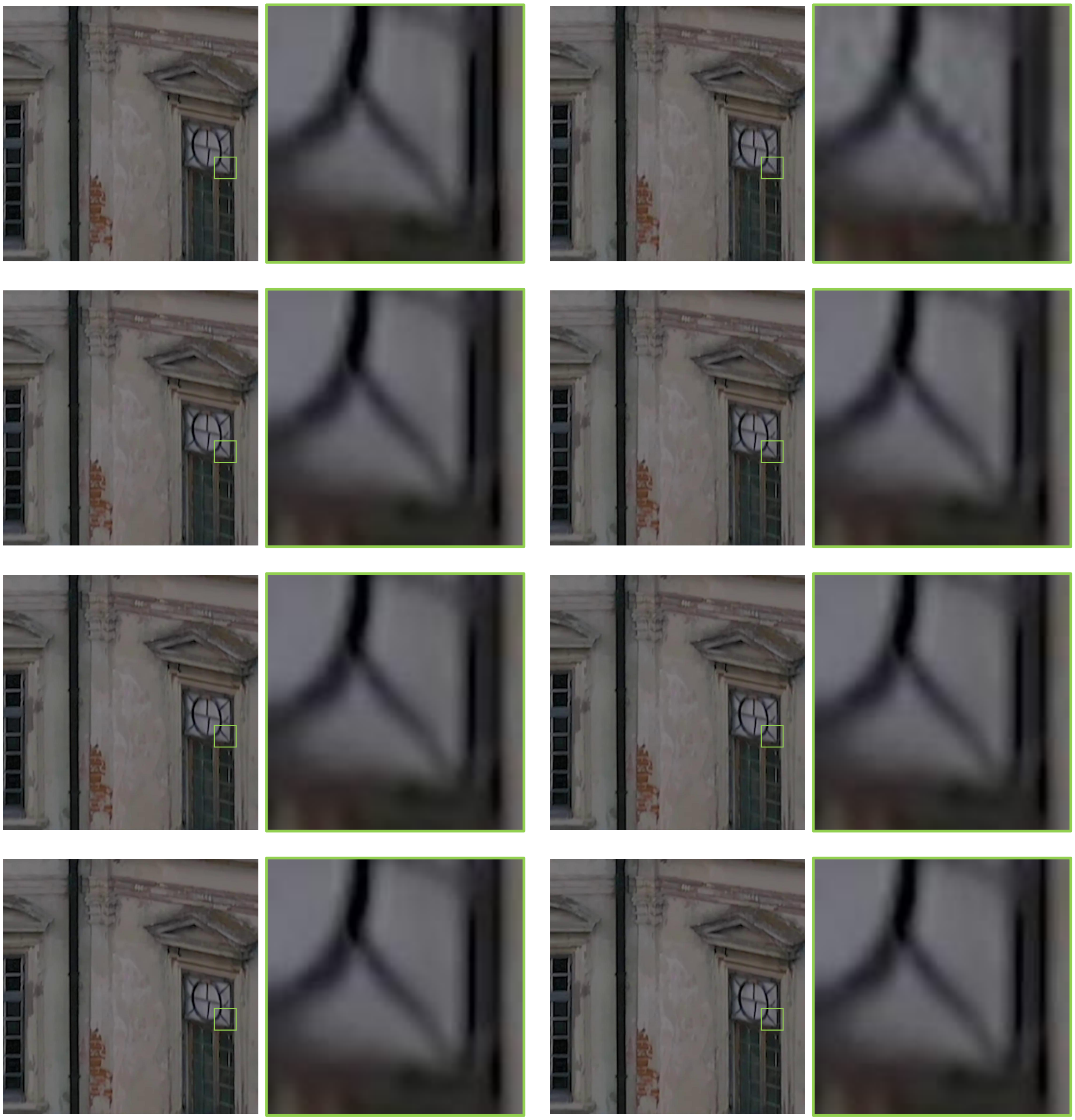

Figure 8. From top to bottom, left to right: HR, results of bicubic, SRCNN [2], RCAN [4], RDN [5], HAN [3], DRLN [1] and ours.

9. Visual Results on the CityWalk8K Dataset with $3\times$ Setting

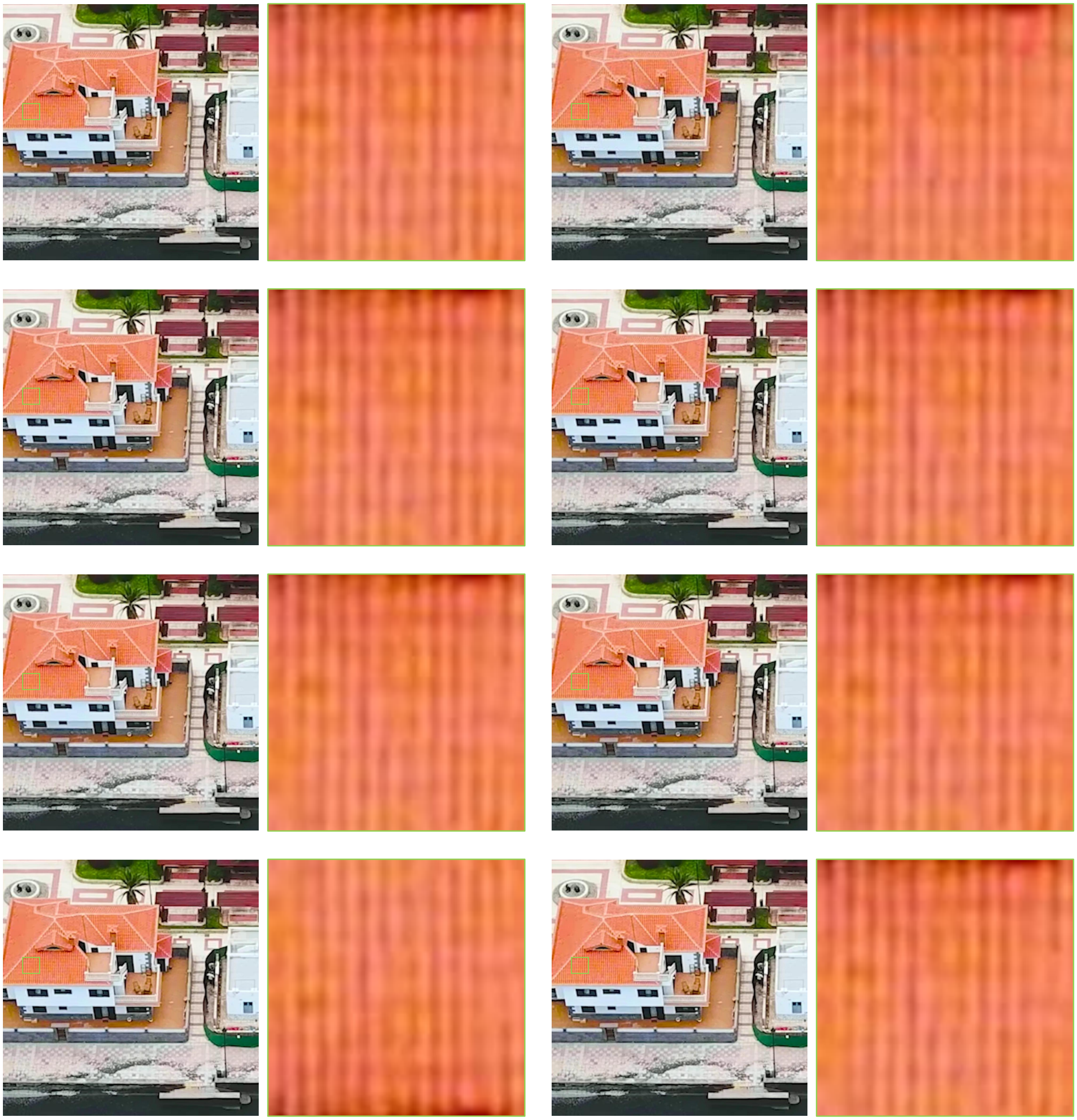

Figure 9. From top to bottom, left to right: HR, results of bicubic, SRCNN [2], RCAN [4], RDN [5], HAN [3], DRLN [1] and ours. For 4K UHD SR with the scale factor of $3\times$, the method of bicubic interpolation can achieve similar performance as the state-of-the-art SR methods.

10. Visual Results on the CityWalk8K Dataset with $2\times$ Setting

Figure 10. From top to bottom, left to right: HR, results of bicubic, SRCNN [2], RCAN [4], RDN [5], HAN [3], DRLN [1] and ours. For 8K UHD SR with the scale factor of $2\times$, the method of bicubic interpolation can achieve similar performance as the state-of-the-art SR methods.