Supplementary Material

Robust Pixel-wise Dehazing Algorithm based on Advanced Haze-Relevant Features

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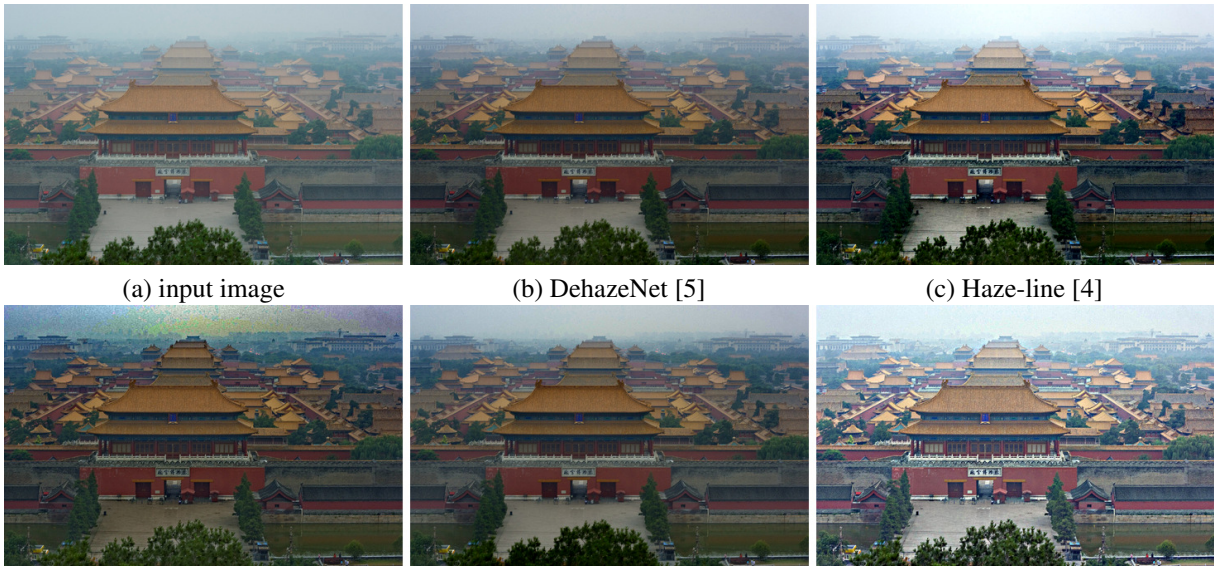
1 Additional Results

Here we provide additional experimental results. The proposed algorithm was compared with the state-of-the-art methods such as color-line [9], haze-line [4], DehazeNet [5], MSCNN [26], Meng's method [22], CO [14], and He's method [15] on basic dehazing dataset [9] and more real-world images [6].



(a) input image (b) DehazeNet [5] (c) Haze-line [4]

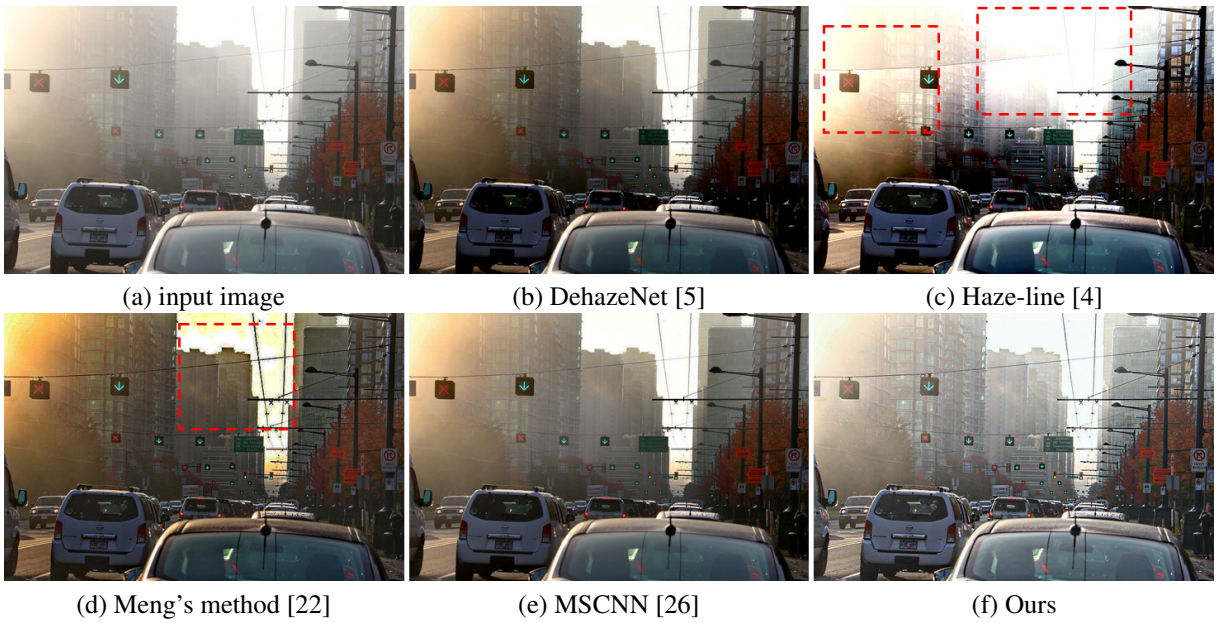
(d) Meng's method [22] (e) MSCNN [26] (f) Ours

Figure 1: Dehazing results on *real-world* image 1. Our dehazing image has high brightness and is clearly visible compared to other algorithms.

(a) input image (b) DehazeNet [5] (c) Haze-line [4]

(d) Meng's method [22] (e) MSCNN [26] (f) Ours

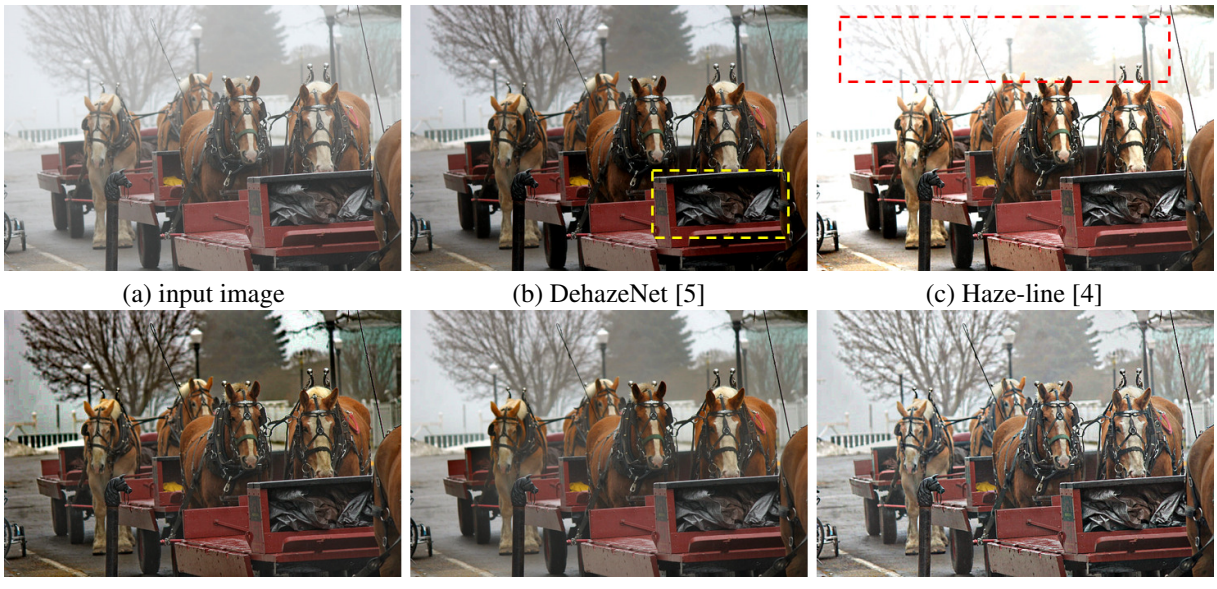
Figure 2: Dehazing results on *real-world* image 2. The dehazing results in (c), (d) have colour distortion and artifact on the roads and sky region, respectively. Our dehazing image is natural and preserves more details.



(a) input image (b) DehazeNet [5] (c) Haze-line [4]

(d) Meng's method [22] (e) MSCNN [26] (f) Ours

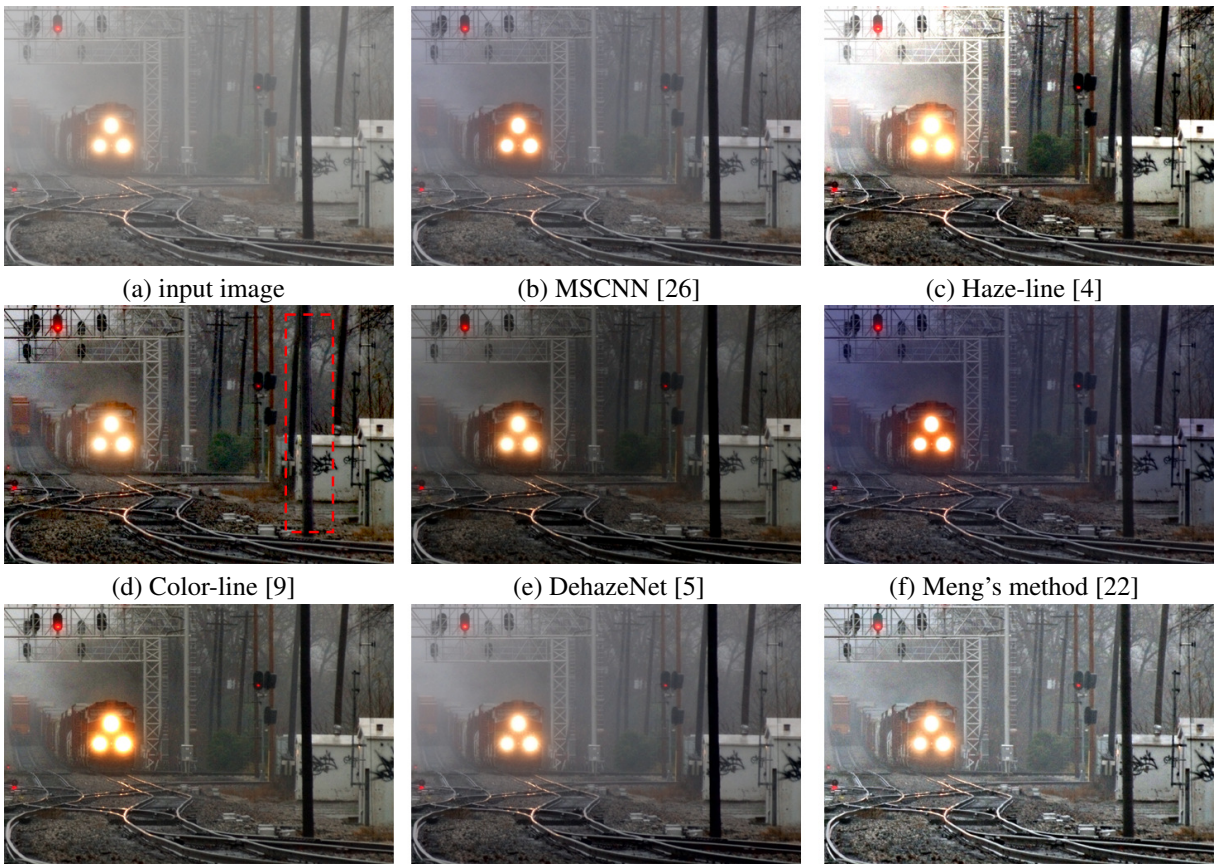
Figure 3: Dehazing results on *real-world* image 3. Our result has more visibility and details than other results. In (b) and (c), the saturation and artifact problems occurred in brightness region, respectively. In (b) and (e), the haze was less removed.



(a) input image (b) DehazeNet [5] (c) Haze-line [4]

(d) Meng's method [22] (e) MSCNN [26] (f) Ours

Figure 4: Dehazing results on *real-world* image 4. In (c), the saturation problem occurred in brightness region. Our dehazing image is natural qualitatively and preserves more details. In (b), many details are lost in the dark region.



(a) input image (b) MSCNN [26] (c) Haze-line [4]

(d) Color-line [9] (e) DehazeNet [5] (f) Meng's method [22]

(g) He's method [15] (h) CO [14] (i) Ours

Figure 5: Dehazing result on *train* image. In (d), the over-ehancement problem occurred nearby pillar. The CO's result [14] and MSCNN [26] still contain a lot of haze.

(a) input image (b) MSCNN [26]

(c) Meng's method [22] (d) Haze-line [4]

(e) Color-line [9] (f) Ours

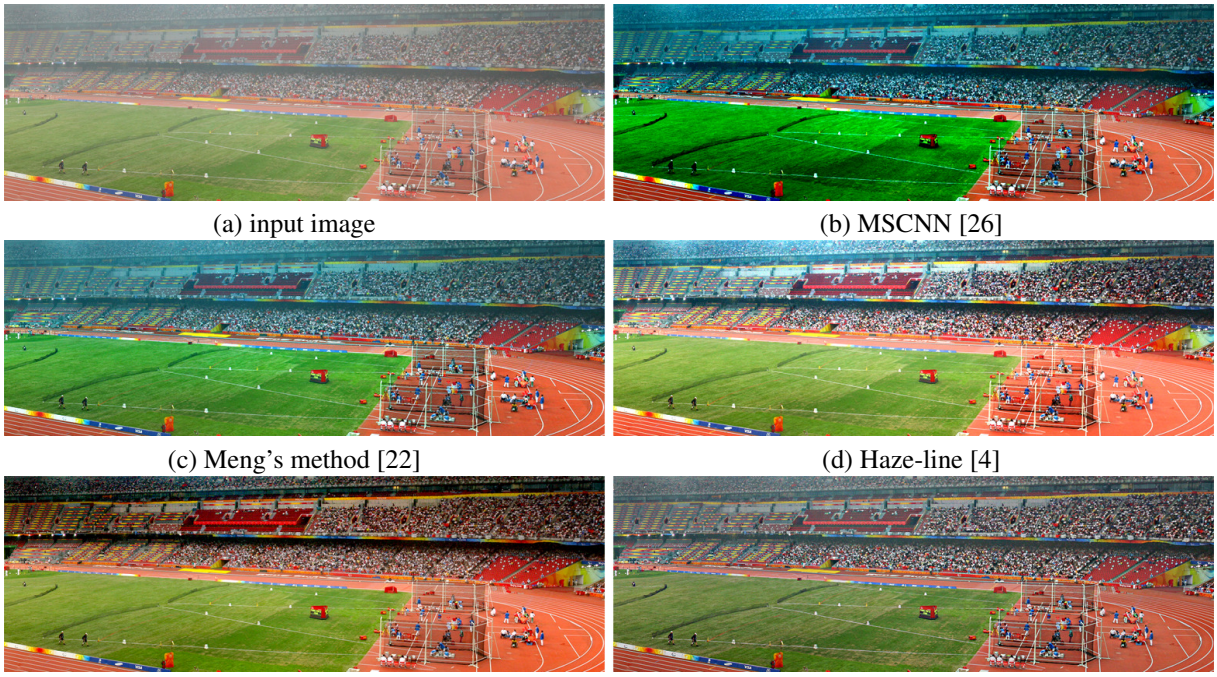
Figure 6: Dehazing result in *florence* image. The Meng's method [22], Haze-line [4], and Color-line [9] have colour distortion problems. In (c) and (e), the saturation and artifact problems occurred in sky region, respectively. The MSCNN result [26] has low details as shown in red boxes compared to our method.

(a) input image (b) MSCNN [26]

(c) Meng's method [22] (d) Haze-line [4]

(e) Color-line [9] (f) Ours

Figure 7: Dehazing result in *herzeliya* image. Haze-line [4] has the saturation problem. Our method preserves more details than MSCNN [26] and Color-line [9].



(a) input image (b) MSCNN [26]

(c) Meng's method [22] (d) Haze-line [4]

(e) Color-line [9] (f) Ours

Figure 8: Dehazing result in *stadium* image. MSCNN [26] and Meng's method [22] have colour distortion problems.

(a) input image (b) MSCNN [26]

(c) Meng's method [22] (d) Haze-line [4]

(e) Color-line [9] (f) Ours

Figure 9: Dehazing result in *fruit* image. The MSCNN result [26] has a low detail as shown in the purple box and Haze-line result [4] have the saturation problem. Meng's result [22] includes artifacts in brightness region. The Color-line result [9] has a very low error and is similar to the original image. Compared to [9], the proposed method preserves more details in the haze-free image and produces a better vivid colour image.

(a) Night-time images (b) Pixel-wise atmospheric light (c) Dehazing results

Figure 10: Pixel-wise atmospheric light and dehazing results on *night-time* images. Our dehazing algorithm can be used during nighttime scene.

References

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