Extracting Vignetting and Grain Filter Effects from Photos —Supplemental Material—

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In this supplemental document, we provide additional visual results showing the efficacy of our method in extracting and transferring vignetting and grain filters between images. We also show additional comparisons to other style transfer methods. In addition, we examine the generalization of our method to other vignetting and grain filter models.

1. Filter extraction and transfer

Figures 1 and 2 show examples of extraction and transfer of vignetting and grain filters from images in our testing set. The input style images contain both vignetting and grain effects. In the third and fourth columns, we show our method's extraction and transfer of vignetting only and vignetting and grain together, respectively. We combine our method with Reinhard et al. [6] for color transfer (last column). It is noticeable that the color transfer ability of [6] is limited; however, our method can faithfully transfer the vignetting and grain effects.

2. Comparison to Style Transfer

In Figures 3 and 4, we show additional results for comparing our method against the conventional color transfer algorithm of Reinhard et al. [6] and various deep learning-based style transfer methods, such as WCT [3] and STROTSS [1], including photo-realistic methods, such as LinST [2], PhotoWCT [4], and WCT2 [7]. Figure 3 shows vignetting transfer while Figure 4 shows examples for image grain transfer. The color transfer approach of [6] applies global color transformation and cannot model spatial variations. Existing deep learning-based style transfer methods [2, 3, 4, 7] are also not well suited to transfer spatial effects, such as vignetting and grain. It can be observed that these methods distort colors (and sometimes even the structure) of the content image based on the filtered image, and fail to achieve the intended effect. In contrast, since our method is focusing on spatial filters, our approach faithfully transfers the vignetting and grain effect.

3. Generalization to other filter models

We show that our method can work with other filter models; but the visual appearance of different models can be different. Without retraining, we tested our method on vignetting generated by [8] (Figure 5) and grain generated by [5] and Gaussian noise (Figure 6). Our method can still produce plausible results despite the gap between training and testing models. The efficiency aspect should be taken into account as well; with Simplex noise, we generate grain at 1.4 sec/megapixel while [5] takes 215 sec/megapixel.

*This work was done while Jonghwa Yim was at Samsung Electronics.

References

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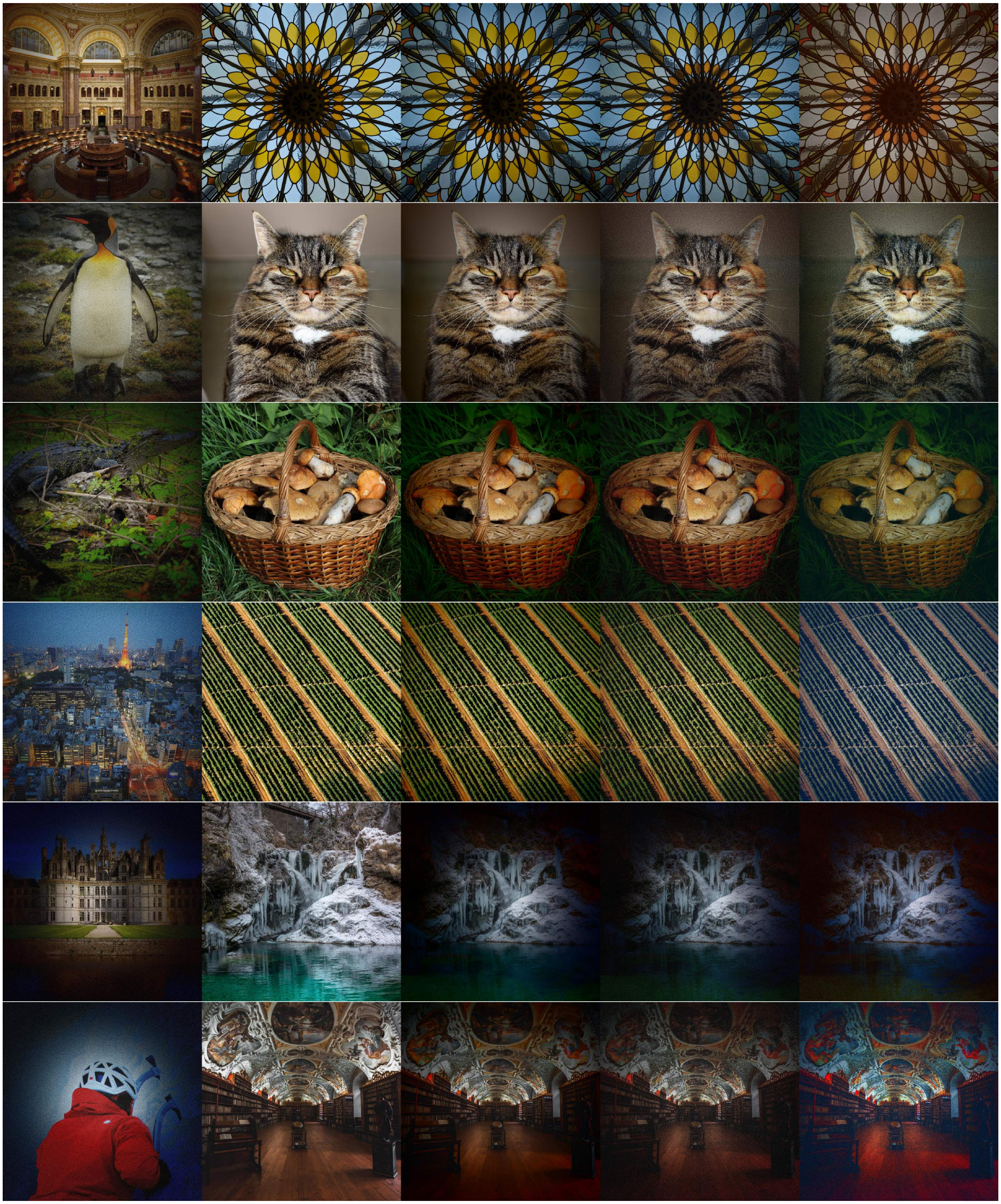
Figure 1. Examples of extraction and transfer of vignetting and grain filters from images in our testing set. We combine our method with Reinhard et al. [6] for color transfer (last column). Grain details are better visualized while zoomed in.



Input style image (vignette + grain)	Input content image	Output image (vignette)	Output image (vignette + grain)	Output image (vignette + grain + color)

Figure 2. Examples of extraction and transfer of vignetting and grain filters from images in our testing set. We combine our method with Reinhard et al. [6] for color transfer (last column). Grain details are better visualized while zoomed in.

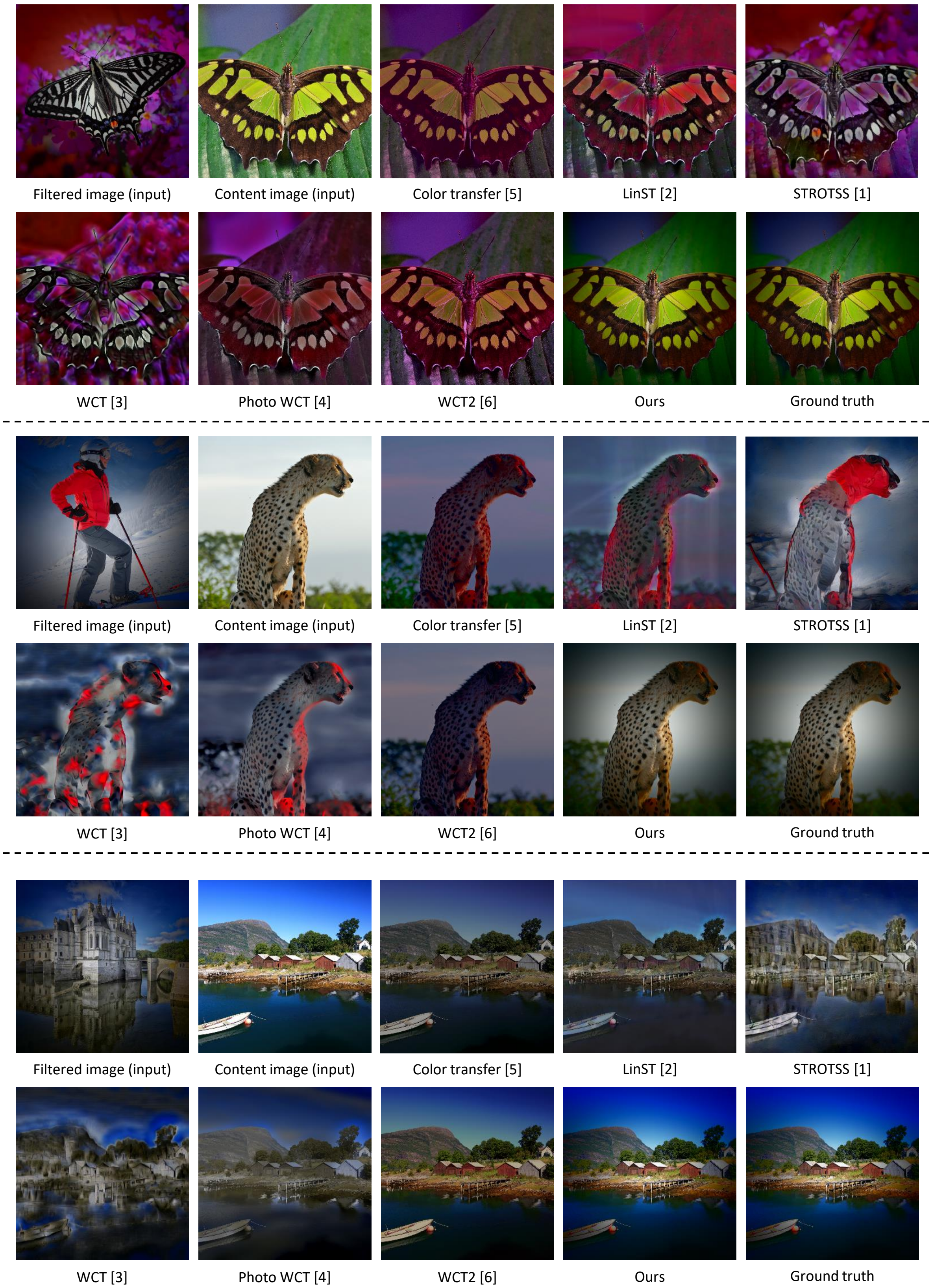


Figure 3. Comparisons of vignetting transfer with the conventional color transfer algorithm of Reinhard et al. [6], and various deep learning-based style transfer methods such as LinST [2], STROTSS [1], WCT [3], PhotoWCT [4], and WCT2 [7].

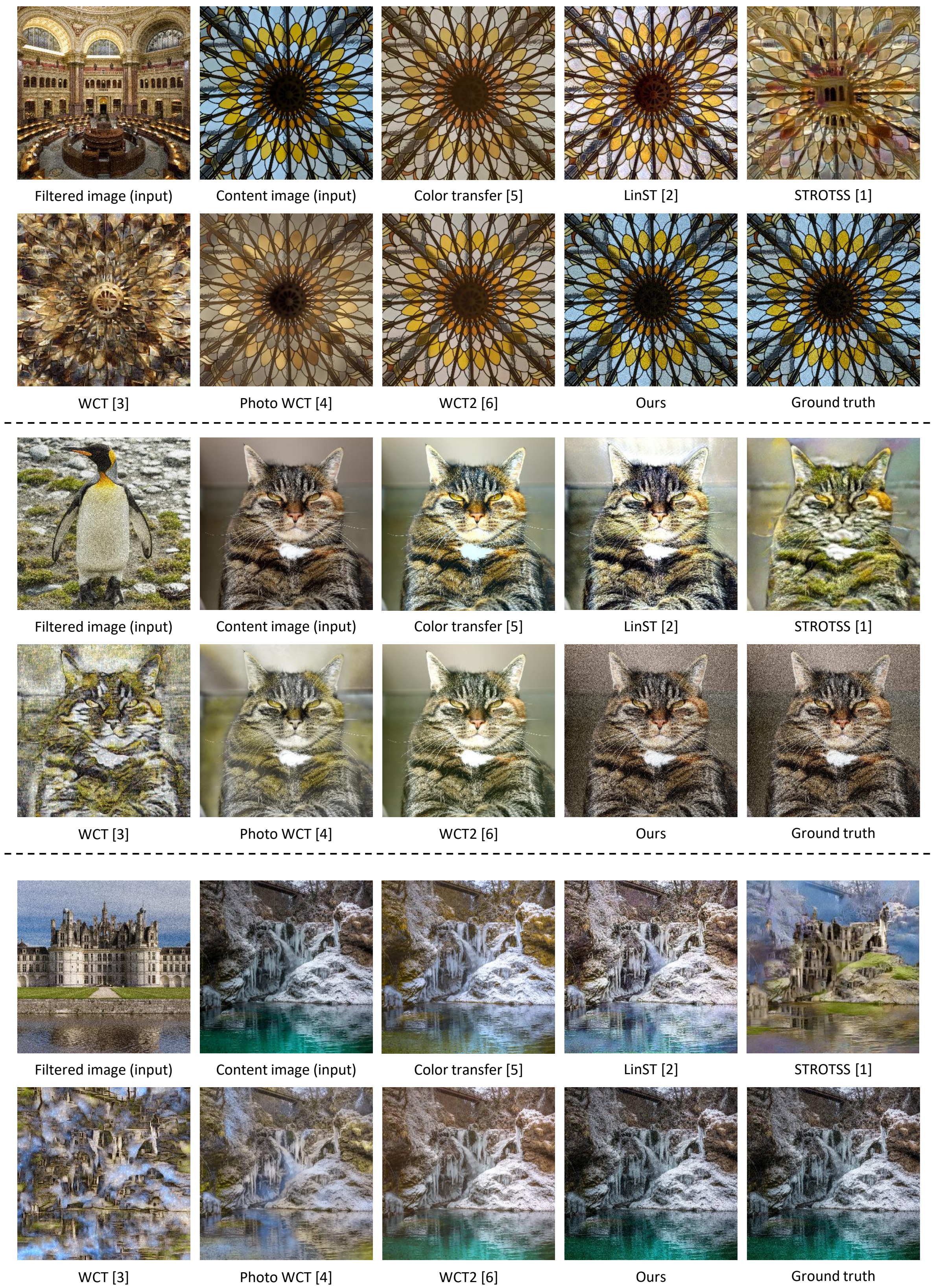


Figure 4. Comparisons of image grain transfer with the conventional color transfer algorithm of Reinhard et al. [6], and various deep learning-based style transfer methods such as LinST [2], STROTSS [1], WCT [3], PhotoWCT [4], and WCT2 [7].

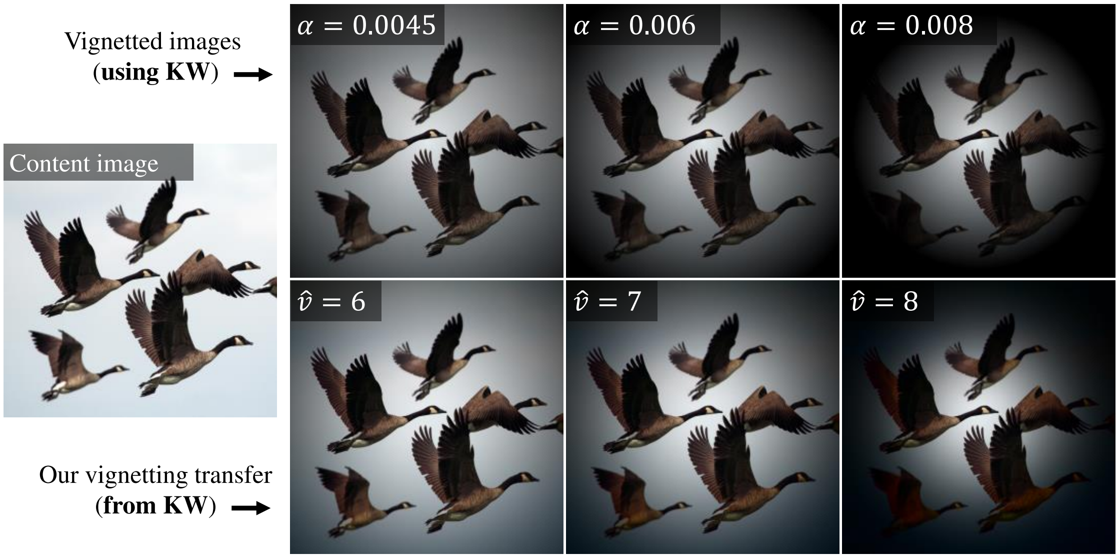


Figure 5. Synthetic vignetted images (top) using Kang-Weiss (**KW**) model [8]. Our transfer results from KW images (bottom). α is KW's parameter. $\hat{v}$ is our estimated vignetting strength. Our vignetting model and results are visually close to KW model.

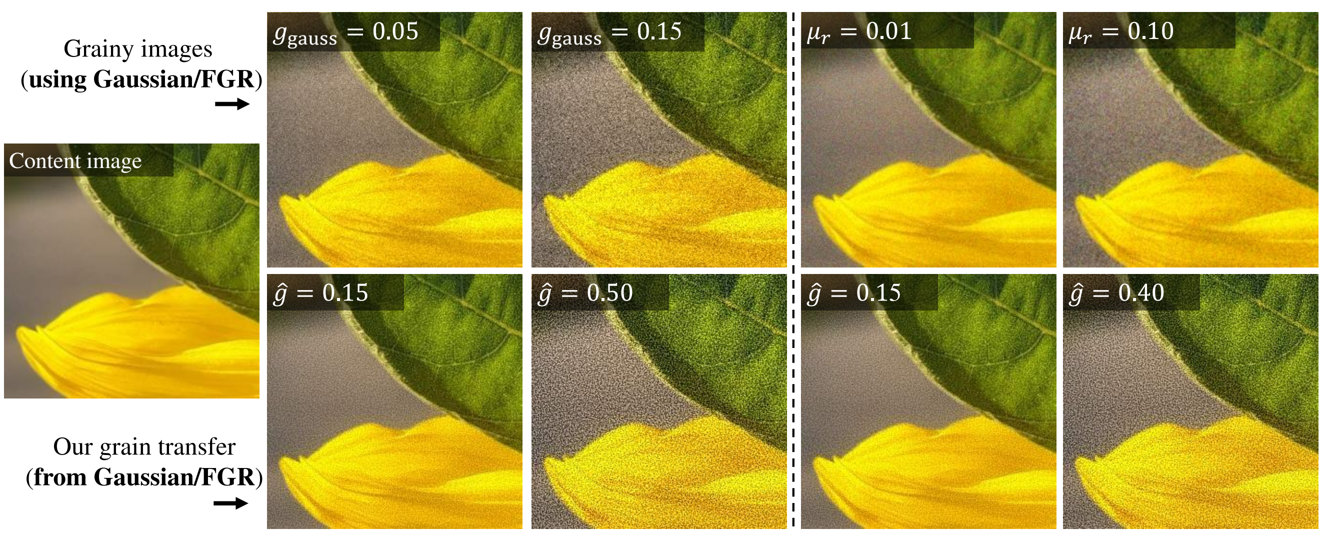


Figure 6. Synthetic grain images (top) using Gaussian noise and FGR [5]. g_{gauss}, μ_r are Gaussian intensity and grain radius for [5]. Our transfer results (bottom) are visually close.