Weakly-supervising the Deep Priors for Blind Image Deconvolution
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Motivation
- This work is inspired by a deep priors for blind image deconvolution framework what is optimized by reconstructing the input blurry image [1].
- The latent image is an intermediate result that is not guaranteed to be what we expected [2, 3].
- Therefore, we utilize a pre-trained deblurring network for weak supervision.

Proposed methods
- Main contribution:
  - The existing network is randomly initialized and expected to model the image prior (limited prior knowledge).
  - We propose to add a supervision directly at the intermediate latent image by utilizing a pre-trained deblurring model.
  - A early stopping criteria is developed to avoid overfitting.

Related Work
- Ren et al. [1] proposed a self-supervised method to deblur an image. However, the network is randomly initialized without learned rich feature from large-scale dataset. The expected deblurred image is also the intermediate result which might not be clean as we expected [2, 3]. It also requires large number of iterations to deblur an image. An adaptive early stopping criteria should be developed for efficiency.

Experimental Results
<table>
<thead>
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</thead>
<tbody>
<tr>
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<td>25.19</td>
<td>25.56</td>
<td>33.80</td>
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<td>SSIM</td>
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<td>0.771</td>
<td>0.729</td>
<td>0.938</td>
<td>0.924</td>
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</table>

Table 1 PSNR/SSIM results for different methods. Adding weak supervision is beneficial.

<table>
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<tr>
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<td>PSNR</td>
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</tbody>
</table>

Table 2 PSNR/SSIM results for utilizing MSE as a stopping criteria.

References
[3] Chi et al, All at Once: Temporally Adaptive Multi-Frame Interpolation with Advanced Motion Modeling, ECCV, 2020