

## Accepted Manuscript

Spatial-scale-regularized blur kernel estimation for blind image deblurring

Shu Tang, Xianzhong Xie, Ming Xia, Lei Luo, Peisong Liu, Zhixing Li



PII: S0923-5965(18)30738-0  
DOI: <https://doi.org/10.1016/j.image.2018.07.010>  
Reference: IMAGE 15425

To appear in: *Signal Processing: Image Communication*

Received date: 28 September 2017  
Revised date: 25 July 2018  
Accepted date: 25 July 2018

Please cite this article as: S. Tang, X. Xie, M. Xia, L. Luo, P. Liu, Z. Li, Spatial-scale-regularized blur kernel estimation for blind image deblurring, *Signal Processing: Image Communication* (2018), <https://doi.org/10.1016/j.image.2018.07.010>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

**Spatial-scale-regularized blur kernel estimation for blind image deblurring**

Shu Tang<sup>1,\*</sup>, Xianzhong Xie<sup>1</sup>, Ming Xia<sup>1</sup>, Lei Luo<sup>1</sup>, Peisong Liu<sup>2</sup>, and Zhixing Li<sup>1</sup>

<sup>1</sup>Chongqing Key Laboratory of Computer Network and Communications Technology,  
Chongqing University of Posts and Telecommunications, Chongqing 400065, China

<sup>2</sup>Shapingba branch network security detachment, Chongqing public security bureau,  
Chongqing 400030, China

EDICS category: CL1.4.2-Image processing

**Abstract**

Blind image deblurring is a long-standing and challenging inverse problem in image processing. In this paper, we propose a new spatial-scale-regularized approach to estimate a blur kernel (BK) from a single motion blurred image by regularizing the spatial scale sizes of image edges. Furthermore, by applying shock filter into the proposed model, our method is able to recover sharp large-scale edges for accurate BK estimation. Finally, we propose an efficient optimization strategy which can solve the proposed model efficiently. Extensive experiments compared with state-of-the-art blind motion deblurring methods demonstrate the effectiveness of the proposed method in terms of subjective vision, deconvolution error ratio (DER), peak signal-to-noise ratio (PSNR), self-similarity measure (SSIM), and sum of squared differences error (SSDE).

*Keywords:* blind image deblurring; spatial scale; shock filter; large-scale edges; blur kernel.

---

\* Corresponding author. Tel.: +86 18223376355; E-mail address: tangshu@cqupt.edu.cn

Download English Version:

<https://daneshyari.com/en/article/6941425>

Download Persian Version:

<https://daneshyari.com/article/6941425>

[Daneshyari.com](https://daneshyari.com)