Chen, Ke

Editorial: Introduction to variational image-processing models and applications. (English)

Zbl 1278.68329

Int. J. Comput. Math. 90, No. 1, 1-8 (2013).

Summary: Variational image-processing models offer high-quality processing capabilities for imaging. They have been widely developed and used in the last two decades, enriching the fields of mathematics as well as information science. Mathematically, several tools are needed: energy optimization, regularization, partial differential equations, level set functions, and numerical algorithms. This special issue presents readers with nine excellent research papers covering topics from research work into variational image-processing models, algorithms and applications, including image denoising, image deblurring, image segmentation, image reconstruction, restoration of mixed noise types and three-dimensional surface restoration.

MSC:

68U10 Computing methodologies for image processing
74G75 Inverse problems in equilibrium solid mechanics
65K10 Numerical optimization and variational techniques
65N55 Multigrid methods; domain decomposition for boundary value problems involving PDEs
74G65 Energy minimization in equilibrium problems in solid mechanics
94A08 Image processing (compression, reconstruction, etc.) in information and communication theory

Keywords:

image processing; denoising; deblurring; segmentation; reconstruction; multiplicative noise; minimization; surface fairing

Software:

FAIR.m

Full Text: DOI

References:

[1] Barendt S., Int. J. Comput. Math. 90 (1) pp 82– (2013) · Zbl 1278.92024 · doi:10.1080/00207160.2012.716514

[2] Bonettini S., Int. J. Comput. Math. 90 (1) pp 9– (2013) · Zbl 1278.68326 · doi:10.1080/00207160.2012.716513

[3] Bredies K., Int. J. Comput. Math. 90 (1) pp 109– (2013) · Zbl 1278.68327 · doi:10.1080/00207160.2012.700400

[4] Brito C., SIAM J. Imaging Sci. 3 (3) pp 363– (2010) · Zbl 1205.68474 · doi:10.1137/080737903

[5] Brito-Loeza C., Int. J. Comput. Math. 90 (1) pp 92– (2013) · Zbl 1280.65022 · doi:10.1080/00207160.2012.720370

[6] Chan T. F., Image Processing and Analysis – Variational, PDE, Wavelet, and Stochastic Methods (2005) · Zbl 1095.68127 · doi:10.1137/1.9780898717877

[7] DOI: 10.1017/CBO9780511543258 · Zbl 1079.65057 · doi:10.1017/CBO9780511543258

[8] Chumchob N., Int. J. Comput. Math. 90 (1) pp 140– (2013) · Zbl 1278.68330 · doi:10.1080/00207160.2012.709625

[9] DOI: 10.4171/IFB/105 · Zbl 1062.35028 · doi:10.4171/IFB/105

[10] DOI: 10.1137/080736612 · Zbl 1185.68803 · doi:10.1137/080736612

[11] Hansen P. C., Deblurring Images: Matrices, Spectra, and Filtering (2006) · Zbl 1112.68127 · doi:10.1137/1.9780898718874

[12] Häuser S., Int. J. Comput. Math. 90 (1) pp 62– (2013) · Zbl 1278.65208 · doi:10.1080/00207160.2012.688960

[13] Lysaker M., IEEE Trans. Image Proc. 13 (10) pp 345– (2004) · Zbl 1286.94022 · doi:10.1109/TIP.2004.834662

[14] Modersitzki J., FAIR: Flexible Algorithms for Image Registration – Software and Applications (2009) · Zbl 1183.68695 · doi:10.1137/1.9780898718843

[15] DOI: 10.1002/cpa.3160420503 · Zbl 0691.49036 · doi:10.1002/cpa.3160420503

[16] Osher S., Level Set Methods and Dynamic Implicit Surfaces (2003) · Zbl 1026.76001 · doi:10.1007/b98879

[17] DOI: 10.1109/34.56205 · Zbl 05111848 · doi:10.1109/34.56205

[18] DOI: 10.1016/0167-2789(92)90242-F · Zbl 0780.49028 · doi:10.1016/0167-2789(92)90242-F

[19] DOI: 10.1017/CBO9780511626319· doi:10.1017/CBO9780511626319

[20] Sethian J. A., Level Set Methods and Fast Marching Methods: Evolving Interfaces in Computational Geometry, Fluid Mechanics, Computer Vision and Materials Science (1999) · Zbl 0973.76003

[21] Scherzer O., Variational Methods in Imaging (2009) · Zbl 1177.68245

[22] Tai X. C., Scale Space and Variational Methods in Computer Vision 5567 (2009)

[23] DOI: 10.1145/944020.944024 · Zbl 05457622 · doi:10.1145/944020.944024

[24] Vese L. A., Variational Methods in Image Processing (2012)

[25] DOI: 10.1137/1.9780898717570 · Zbl 1008.65103 · doi:10.1137/1.9780898717570

[26] Wang F., Int. J. Comput. Math. 90 (1) pp 48– (2013) · Zbl 1278.94013 · doi:10.1080/00207160.2012.688821

[27] Yan M., Int. J. Comput. Math. 90 (1) pp 30– (2013) · Zbl 1279.94043 · doi:10.1080/00207160.2012.709933

[28] DOI: 10.1137/110822268 · Zbl 1258.94021 · doi:10.1137/110822268

[29] Zhu W., Int. J. Comput. Math. 90 (1) pp 124– (2013) · Zbl 1278.68336 · doi:10.1080/00207160.2012.695355