

# IEEE TRANSACTIONS ON IMAGE PROCESSING

A PUBLICATION OF THE IEEE SIGNAL PROCESSING SOCIETY



[www.signalprocessingsociety.org](http://www.signalprocessingsociety.org)

Indexed in PubMed® and MEDLINE®, products of the United States National Library of Medicine



NOVEMBER 2017  
DECEMBER 2017

VOLUME 26  
VOLUME 26

NUMBER 11  
NUMBER 12

IIPRE4

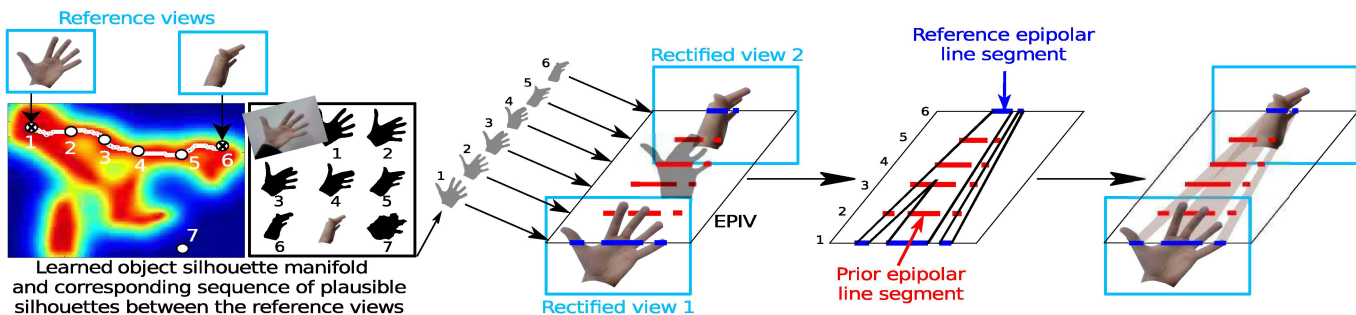
(ISSN 1057-7149)

For the November 2017 issue, see p. 5089 for Table of Contents.

For the December 2017 issue, see p. 5555 for Table of Contents.

Cover art from: "Wide-Baseline Foreground Object Interpolation Using Silhouette Shape Prior"

by Cdric Verleysen, Thomas Maugey, Pascal Frossard, and Christophe De Vleeschouwer (p. 5477–5490, Fig. 3).



# IEEE TRANSACTIONS ON IMAGE PROCESSING

A PUBLICATION OF THE IEEE SIGNAL PROCESSING SOCIETY



[www.signalprocessingsociety.org](http://www.signalprocessingsociety.org)

Indexed in PubMed® and MEDLINE®, products of the United States National Library of Medicine



NOVEMBER 2017

VOLUME 26

NUMBER 11

IIPRE4

(ISSN 1057-7149)

---

## PAPERS

Sparse-Based Color Image Super Resolution via Exploiting Cross Channel Constraints .....	<i>H. S. Mousavi and V. Monga</i>	5094
Understanding Symmetric Smoothing Filters: A Gaussian Mixture Model Perspective .....	<i>S. H. Chan, T. Zickler, and Yue M. Lu</i>	5107
A Novel Method of Minimizing View Synthesis Distortion Based on Its Non-Monotonicity in 3D Video .....	<i>M. Yang, N. Zheng, C. Zhu, and F. Wang</i>	5122
Full Reference Quality Assessment for Image Retargeting Based on Natural Scene Statistics Modeling and Bi-Directional Saliency Similarity .....	<i>Z. Chen, J. Lin, N. Liao, and C. W. Chen</i>	5138
Point Light Source Position Estimation From RGB-D Images by Learning Surface Attributes .....	<i>S. Karaoglu, Y. Liu, T. Gevers, and A. W. M. Smeulders</i>	5149
Fast Low-Rank Shared Dictionary Learning for Image Classification .....	<i>T. H. Vu and V. Monga</i>	5160
Sparse Image Reconstruction on the Sphere: Analysis and Synthesis .....	<i>C. G. R. Wallis, Y. Wiaux, and J. D. McEwen</i>	5176
Example-Based Image Colorization Using Locality Consistent Sparse Representation .....	<i>B. Li, F. Zhao, Z. Su, X. Liang, Y.-K. Lai, and P. L. Rosin</i>	5188
Unsupervised Primary Object Discovery in Videos Based on Evolutionary Primary Object Modeling With Reliable Object Proposals .....	<i>Y. J. Koh and C.-S. Kim</i>	5203

(Contents Continued on Page 5090)

IEEE TRANSACTIONS ON IMAGE PROCESSING (ISSN 1057-7149) is published monthly by the Institute of Electrical and Electronics Engineers, Inc. Responsibility for the contents rests upon the authors and not upon the IEEE, the Society/Council, or its members. **IEEE Corporate Office:** 3 Park Avenue, 17th Floor, New York, NY 10016-5997. **IEEE Operations Center:** 445 Hoes Lane, Piscataway, NJ 08854-4141. **NJ Telephone:** +1 732 981 0060. **Price/Publication Information:** Individual copies: IEEE Members \$20.00 (first copy only), nonmembers \$631.00 per copy. (Note: Postage and handling charge not included.) Member and nonmember subscription prices available upon request. Available in print, electronic, and CD-ROM. **Copyright and Reprint Permissions:** Abstracting is permitted with credit to the source. Libraries are permitted to photocopy for private use of patrons, provided the per-copy fee of \$31.00 is paid through the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923. For all other copying, reprint, or republication permission, write to Copyrights and Permissions Department, IEEE Publications Administration, 445 Hoes Lane, Piscataway, NJ 08854-4141 Copyright © 2017 by the Institute of Electrical and Electronics Engineers, Inc. All rights reserved. **Postmaster:** Send address changes to IEEE TRANSACTIONS ON IMAGE PROCESSING, IEEE, 445 Hoes Lane, Piscataway, NJ 08854-4141. GST Registration No. 125634188. CPC Sales Agreement #40013087. Return undeliverable Canada addresses to: Pitney Bowes IMEX, P.O. Box 4332, Stanton Rd., Toronto, ON M5W 3J4, Canada. IEEE prohibits discrimination, harassment and bullying. For more information visit <http://www.ieee.org/nondiscrimination>. Printed in U.S.A.

---

Study of Temporal Effects on Subjective Video Quality of Experience .....	
..... C. G. Bampis, Z. Li, A. K. Moorthy, I. Katsavounidis, A. Aaron, and A. C. Bovik	5217
Least Squares Image Estimation for Large Data in the Presence of Noise and Irregular Sampling .....	L. Piazzo 5232
Extensive Benchmark and Survey of Modeling Methods for Scene Background Initialization .....	
..... P.-M. Jodoin, L. Maddalena, A. Petrosino, and Y. Wang	5244
LLE Score: A New Filter-Based Unsupervised Feature Selection Method Based on Nonlinear Manifold Embedding and Its Application to Image Recognition .....	C. Yao, Y.-F. Liu, B. Jiang, J. Han, and J. Han 5257
Extending Correlation Filter-Based Visual Tracking by Tree-Structured Ensemble and Spatial Windowing .....	
..... E. Gundogdu, H. Ozkan, and A. A. Alatan	5270
Multiscale Shannon's Entropy Modeling of Orientation and Distance in Steel Fiber Micro-Tomography Data .....	
..... J. P. Chiverton, O. Ige, S. J. Barnett, and T. Parry	5284
DeepSkeleton: Learning Multi-Task Scale-Associated Deep Side Outputs for Object Skeleton Extraction in Natural Images .....	W. Shen, K. Zhao, Y. Jiang, Y. Wang, X. Bai, and A. Yuille 5298
Nonparametric Joint Shape and Feature Priors for Image Segmentation .....	
..... E. Erdil, M. U. Ghani, L. Rada, A. O. Argunsah, D. Unay, T. Tasdizen, and M. Cetin	5312
Distributed Adaptive Binary Quantization for Fast Nearest Neighbor Search .....	X. Liu, Z. Li, C. Deng, and D. Tao 5324
Multi-Image Blind Super-Resolution of 3D Scenes .....	A. Punnappurath, T. M. Nimisha, and A. N. Rajagopalan 5337
Reconstructing Interlaced High-Dynamic-Range Video Using Joint Learning .....	I. Choi, S.-H. Baek, and M. H. Kim 5353
Hash Bit Selection for Nearest Neighbor Search .....	X. Liu, J. He, and S.-F. Chang 5367
Near-Infrared Coloring via a Contrast-Preserving Mapping Model .....	C.-H. Son and X.-P. Zhang 5381
Piecewise-Stationary Motion Modeling and Iterative Smoothing to Track Heterogeneous Particle Motions in Dense Environments .....	P. Roudot, L. Ding, K. Jaqaman, C. Kervrann, and G. Danuser 5395
Toward Optimal Manifold Hashing via Discrete Locally Linear Embedding .....	
..... R. Ji, H. Liu, L. Cao, D. Liu, Y. Wu, and F. Huang	5411
Distortion-Aware Correlation Tracking .....	H. Li, H. Wu, H. Zhang, S. Lin, X. Luo, and R. Wang 5421
Out-of-Sample Extension for Dimensionality Reduction of Noisy Time Series .....	
..... H. Dadkhahi, M. F. Duarte, and B. M. Marlin	5435
Matched Shrunk Cone Detector (MSCD): Bayesian Derivations and Case Studies for Hyperspectral Target Detection .....	Z. Wang, R. Zhu, K. Fukui, and J.-H. Xue 5447
Unified Blind Quality Assessment of Compressed Natural, Graphic, and Screen Content Images .....	
..... X. Min, K. Ma, K. Gu, G. Zhai, Z. Wang, and W. Lin	5462
Comments on "Iterative Re-Constrained Group Sparse Face Recognition With Adaptive Weights Learning" .....	
..... H. Li, H. Hu, and C. Yip	5475
Wide-Baseline Foreground Object Interpolation Using Silhouette Shape Prior .....	
..... C. Verleysen, T. Maugey, P. Frossard, and C. De Vleeschouwer	5477
Colorization Using Neural Network Ensemble .....	Z. Cheng, Q. Yang, and B. Sheng 5491
Category-Specific Object Image Denoising .....	S. Anwar, F. Porikli, and C. P. Huynh 5506
Low-Rank Latent Pattern Approximation With Applications to Robust Image Classification .....	
..... S. Chen, J. Yang, L. Luo, Y. Wei, K. Zhang, and Y. Tai	5519
Unsupervised t-Distributed Video Hashing and Its Deep Hashing Extension .....	
..... Y. Hao, T. Mu, J. Y. Goulermas, J. Jiang, R. Hong, and M. Wang	5531
A 3D Reconstruction Strategy of Vehicle Outline Based on Single-Pass Single-Polarization CSAR Data .....	
..... L. Chen, D. An, X. Huang, and Z. Zhou	5545

---