

IEEE

# SIGNAL PROCESSING LETTERS

A PUBLICATION OF THE IEEE SIGNAL PROCESSING SOCIETY



[www.ieee.org/sp/index.html](http://www.ieee.org/sp/index.html)

NOVEMBER 2016

VOLUME 23

NUMBER 11

ISPLEM

(ISSN 1070-9908)

LETTERS

Energy-Efficient and Secure Beamforming for Self-Sustainable Relay-Aided Multicast Networks . . . . .	<i>H. Gao, T. Ly, W. Wang, and N. C. Beaulieu</i>	1509
Joint Tracking and Ground Plane Estimation . . . . .	<i>J. Kwon, R. Dragon, and L. V. Gool</i>	1514
Optimal Auction Design With Quantized Bids . . . . .	<i>N. Cao, S. Brahma, and P. K. Varshney</i>	1518
On the Throughput of Large MIMO Beamforming Systems With Channel Aging . . . . .	<i>R. Chopra, C. R. Murthy, and H. A. Suraweera</i>	1523
GSVD-Based Precoding in MIMO Systems With Integrated Services . . . . .	<i>W. Mei, Z. Chen, and J. Fang</i>	1528
Interactive Stereo Image Segmentation With RGB-D Hybrid Constraints . . . . .	<i>W. Ma, Y. Qin, L. Yang, S. Xu, and X. Zhang</i>	1533
Asymptotic Performance of the Geometric Mean Detector in Pareto Distributed Clutter . . . . .	<i>G. V. Weinberg</i>	1538
Guaranteed Bounds on the Kullback–Leibler Divergence of Univariate Mixtures . . . . .	<i>F. Nielsen and K. Sun</i>	1543
Design of Recursive Digital Filters in Parallel Form by Linearly Constrained Pole Optimization . . . . .	<i>E. Maestre, G. P. Scavone, and J. O. Smith</i>	1547
SAR Image Segmentation With Rényi’s Entropy . . . . .	<i>R. H. Nobre, F. A. A. Rodrigues, R. C. P. Marques, J. S. Nobre, J. F. S. R. Neto, and F. N. S. Medeiros</i>	1551
Besta-Divergence-Based Variational Model for Speckle Reduction . . . . .	<i>H. Woo and J. Ha</i>	1557
Consistent Estimation of Randomly Sampled Ornstein–Uhlenbeck Process Long-Run Mean for Long-Term Target State Prediction . . . . .	<i>L. M. Millefiori, P. Braca, and P. Willett</i>	1562
Face Alignment Using K-Cluster Regression Forests With Weighted Splitting . . . . .	<i>M. Kowalski and J. Naruniec</i>	1567
Iterative Maximum Likelihood and Outlier-robust Bipercenile Estimation of Parameters of Compound-Gaussian Clutter With Inverse Gaussian Texture . . . . .	<i>P.-L. Shui, L.-X. Shi, H. Yu, and Y.-T. Huang</i>	1572
MUG: A Parameterless No-Reference JPEG Quality Evaluator Robust to Block Size and Misalignment . . . . .	<i>H. Z. Nafchi, A. Shahkolaei, R. Hedjam, and M. Cheriet</i>	1577

(Contents Continued on Page 1506)

IEEE SIGNAL PROCESSING LETTERS (ISSN 1070–9908) is published quarterly in print and monthly online 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 \$340.00 per copy. (Note: Postage and handling charge not included.) Member and nonmember subscription prices available upon request. Available in microfiche and microfilm. **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 indicated in the code at the bottom of the first page 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 © 2016 by the Institute of Electrical and Electronics Engineers, Inc. All rights reserved. **Postmaster:** Send address changes to IEEE SIGNAL PROCESSING LETTERS, 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.

---

An Efficient Adaptive Fuzzy Switching Weighted Mean Filter for Salt-and-Pepper Noise Removal . . . . .	1582
..... <i>Y. Wang, J. Wang, X. Song, and L. Han</i>	
MELT—Maximum-Likelihood Estimation of Low-Rank Toeplitz Covariance Matrix . . . . .	1587
..... <i>P. Babu</i>	
Adaptive Retrodiction Particle PHD Filter for Multiple Human Tracking . . . . .	1592
..... <i>P. Feng, W. Wang, S. M. Naqvi, and J. Chambers</i>	
Mixing Oscillators for Phase Noise Reduction . . . . .	1597
..... <i>P. Ferrand</i>	
Joint Detection and Decoding in the Presence of Prior Information With Uncertainty . . . . .	1602
..... <i>S. Bayram, B. Dulek, and S. Gezici</i>	
Unsupervised Segmentation of Markov Random Fields Corrupted by Nonstationary Noise . . . . .	1607
..... <i>A. Habbouchi, M. El Yazid Boudaren, A. Aïssani, and W. Pieczynski</i>	
Power-Weighted Divergences for Relative Attenuation and Delay Estimation . . . . .	1612
..... <i>R. de Fréin and S. T. Rickard</i>	
Free Space Estimation on Nonflat Plane Based on V-Disparity . . . . .	1617
..... <i>L. Qu, K. Wang, L. Chen, Y. Gu, and X. Zhang</i>	
Security Enhancement via Device-to-Device Communication in Cellular Networks . . . . .	1622
..... <i>J. Wang, Q. Tang, C. Yang, R. Schober, and J. Li</i>	
Wirtinger Flow Method With Optimal Stepsize for Phase Retrieval . . . . .	1627
..... <i>X. Jiang, S. Rajan, and X. Liu</i>	
R-FUSE: Robust Fast Fusion of Multiband Images Based on Solving a Sylvester Equation . . . . .	1632
..... <i>Q. Wei, N. Dobbigeon, J.-Y. Tourneret, J. Bioucas-Dias, and S. Godsill</i>	
Double Detector for Sparse Signal Detection From One-Bit Compressed Sensing Measurements . . . . .	1637
..... <i>H. Zayyani, F. Haddadi, and M. Korki</i>	
Improving the Correlation Lower Bound for Simultaneous Orthogonal Matching Pursuit . . . . .	1642
..... <i>J.-F. Determe, J. Louveaux, L. Jacques, and F. Horlin</i>	
Fitting Generalized Multivariate Huber Loss Functions . . . . .	1647
..... <i>E. Peker and A. Wiesel</i>	
A Spectral and Spatial Approach of Coarse-to-Fine Blurred Image Region Detection . . . . .	1652
..... <i>C. Tang, J. Wu, Y. Hou, P. Wang, and W. Li</i>	
Joint Design of Fronthaul and Access Links for C-RAN With Wireless Fronthauling . . . . .	1657
..... <i>S.-H. Park, K.-J. Lee, C. Song, and I. Lee</i>	
Exact Distribution for the Product of Two Correlated Gaussian Random Variables . . . . .	1662
..... <i>G. Cui, X. Yu, S. Iommelli, and L. Kong</i>	
Beyond Semantic Attributes: Discrete Latent Attributes Learning for Zero-Shot Recognition . . . . .	1667
..... <i>J. Qin, Y. Wang, L. Liu, J. Chen, and L. Shao</i>	
Reversible Data Hiding in Encrypted Images Based on Progressive Recovery . . . . .	1672
..... <i>Z. Qian, X. Zhang, and G. Feng</i>	
Optimal Power Allocation for OFDMA Systems Under I/Q Imbalance . . . . .	1677
..... <i>A.-A. A. Boulogeorgos, P. D. Diamantoulakis, and G. K. Karagiannidis</i>	
Nonnegative Matrix Cofactorization for Weakly Supervised Image Parsing . . . . .	1682
..... <i>G. Zhang and X. Gong</i>	
Robust Sparse Signal Recovery in the Presence of the S $\alpha$ S Noise . . . . .	1687
..... <i>R. Hu, Y. Fu, Z. Chen, Y. Xiang, and R. Rong</i>	

---