

IEEE TRANSACTIONS ON MEDICAL IMAGING

A PUBLICATION OF

THE IEEE ENGINEERING IN MEDICINE AND BIOLOGY SOCIETY

THE IEEE NUCLEAR AND PLASMA SCIENCES SOCIETY

THE IEEE SIGNAL PROCESSING SOCIETY

THE IEEE ULTRASONICS, FERROELECTRICS, AND FREQUENCY CONTROL SOCIETY



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



MAY 2016

VOLUME 35

NUMBER 5

ITMID4

(ISSN 0278-0062)

SPECIAL ISSUE ON DEEP LEARNING IN MEDICAL IMAGING

GUEST EDITORIAL

- Deep Learning in Medical Imaging: Overview and Future Promise of an Exciting New Technique
..... *H. Greenspan, B. van Ginneken, and R. M. Summers* 1153
-

SPECIAL ISSUE PAPERS

- Pulmonary Nodule Detection in CT Images: False Positive Reduction Using Multi-View Convolutional Networks
..... *A. A. A. Setio, F. Ciompi,
G. Litjens, P. Gerke, C. Jacobs, S. J. van Riel, M. M. W. Wille, M. Naqibullah, C. I. Sánchez, and B. van Ginneken* 1160
- Improving Computer-Aided Detection Using Convolutional Neural Networks and Random View Aggregation
..... *H. R. Roth, L. Lu, J. Liu, J. Yao, A. Seff, K. Cherry, L. Kim, and R. M. Summers* 1170
- Automatic Detection of Cerebral Microbleeds From MR Images via 3D Convolutional Neural Networks
..... *Q. Dou, H. Chen, L. Yu, L. Zhao, J. Qin, D. Wang, V. C. Mok, L. Shi, and P.-A. Heng* 1182
- Locality Sensitive Deep Learning for Detection and Classification of Nuclei in Routine Colon Cancer Histology Images ..
..... *K. Sirinukunwattana, S. E. A. Raza, Y.-W. Tsang, D. R. J. Snead, I. A. Cree, and N. M. Rajpoot* 1196
- Lung Pattern Classification for Interstitial Lung Diseases Using a Deep Convolutional Neural Network
..... *M. Anthimopoulos, S. Christodoulidis, L. Ebner, A. Christe, and S. Mougiakakou* 1207
- Marginal Space Deep Learning: Efficient Architecture for Volumetric Image Parsing
..... *F. C. Ghesu, E. Krubasik, B. Georgescu, V. Singh, Y. Zheng, J. Hornegger, and D. Comaniciu* 1217
- Deep 3D Convolutional Encoder Networks With Shortcuts for Multiscale Feature Integration Applied to Multiple
Sclerosis Lesion Segmentation *T. Brosch, L. Y. W. Tang, Y. Yoo, D. K. B. Li, A. Traboulsee, and R. Tam* 1229
-

(Contents Continued on Back Cover)

(Contents Continued from Front Cover)

Brain Tumor Segmentation Using Convolutional Neural Networks in MRI Images	S. Pereira, A. Pinto, V. Alves, and C. A. Silva	1240
Automatic Segmentation of MR Brain Images With a Convolutional Neural Network	P. Moeskops, M. A. Viergever, A. M. Mendrik, L. S. de Vries, M. J. N. L. Benders, and I. Išgum	1252
Combining Generative and Discriminative Representation Learning for Lung CT Analysis With Convolutional Restricted Boltzmann Machines	G. van Tulder and M. de Bruijne	1262
Fast Convolutional Neural Network Training Using Selective Data Sampling: Application to Hemorrhage Detection in Color Fundus Images	M. J. J. P. van Grinsven, B. van Ginneken, C. B. Hoyng, T. Theelen, and C. I. Sánchez	1273
Deep Convolutional Neural Networks for Computer-Aided Detection: CNN Architectures, Dataset Characteristics and Transfer Learning	H.-C. Shin, H. R. Roth, M. Gao, L. Lu, Z. Xu, I. Nogues, J. Yao, D. Mollura, and R. M. Summers	1285
Convolutional Neural Networks for Medical Image Analysis: Full Training or Fine Tuning?	N. Tajbakhsh, J. Y. Shin, S. R. Gurudu, R. T. Hurst, C. B. Kendall, M. B. Gotway, and J. Liang	1299
AggNet: Deep Learning From Crowds for Mitosis Detection in Breast Cancer Histology Images	S. Albarqouni, C. Baur, F. Achilles, V. Belagiannis, S. Demirci, and N. Navab	1313
Unsupervised Deep Learning Applied to Breast Density Segmentation and Mammographic Risk Scoring	M. Kallenberg, K. Petersen, M. Nielsen, A. Y. Ng, P. Diao, C. Igel, C. M. Vachon, K. Holland, R. R. Winkel, N. Karssemeijer, and M. Lillholm	1322
Multi-Instance Deep Learning: Discover Discriminative Local Anatomies for Bodypart Recognition	Z. Yan, Y. Zhan, Z. Peng, S. Liao, Y. Shinagawa, S. Zhang, D. N. Metaxas, and X. S. Zhou	1332
q-Space Deep Learning: Twelve-Fold Shorter and Model-Free Diffusion MRI Scans	V. Golkov, A. Dosovitskiy, J. I. Sperl, M. I. Menzel, M. Czisch, P. Sämann, T. Brox, and D. Cremers	1344
A CNN Regression Approach for Real-Time 2D/3D Registration	S. Miao, Z. J. Wang, and R. Liao	1352

ANNOUNCEMENTS

13th Annual International Body Sensor Networks Conference	1364
2016 IEEE Nuclear Science Symposium and Medical Imaging Conference	1365
Call for Papers: IEEE-NIH 2016	1366
Call for Papers: IEEE International Symposium on Biomedical Imaging	1367
Call for Papers: Wireless Health 2016	1368
