

Special Issue on

High Performance Deep Learning Techniques for Big Data Analytics

The past few years have witnessed the momentum of big data which continuously receives a growing effort from both the academia and industry. The challenge with big data is how to extract meaningful information and knowledge from it. Recently, deep learning as an advanced machine learning technique has been widely taken up by the research community due to its multi-layered structure and effectiveness in extracting low level features. Therefore, it is critical to explore advanced and high performance deep learning techniques for big data analytics especially for heterogeneous big data analytics including the process of data acquisition, feature extraction and representation, time series data analysis, knowledge representation, and semantic modeling.

Topics

This special issue aims to solicit high quality research articles as well as reviews reflecting the advances in deep learning for big data analytics of a high volume, velocity, variety and veracity. Potential topics include, but are not limited to:

- Parallel deep neural networks for data analytics of high volumes
- High performance deep neural networks for data stream analytics
- Semantic modeling in big data analytics
- Data driven deep learning for feature extraction
- Large-scale heterogeneous data acquisition
- Deep learning for time series data analytics
- Optimized architectural designs of deep neural networks
- Parameter tuning in deep neural networks
- Distributed deep neural networks for big data analytics
- Brain inspired novel deep neural networks
- Cognition based deep neural networks
- Deep learning applications such as object detection and identification, natural language processing, multiple object tracking, human action recognition, cross-modal and multimodal data analysis.

Paper Solicitation

This issue is an open special issue where everyone is encouraged to submit papers. We will solicit papers through two ways: conference and open call-for-papers.

- 1. Selected Papers from the 13th International Conference on Natural Computation, Fuzzy Systems and Knowledge Discovery (ICNC-FSKD 2017)**

ICNC-FSKD is a premier international forum for scientists and researchers to present the state of the art of data mining and intelligent methods inspired from nature, particularly biological, linguistic, and physical systems, with applications to computers, circuits, systems, control, communications, and more. This is an exciting and emerging interdisciplinary area in which a wide range of theory and methodologies are being investigated and developed to tackle complex and challenging problems. The conference website is http://icnc-fskd.guet.cn/icnc_fskd/index.html

We plan to select the high quality papers relevant to the scope of the Special Issue from the accepted papers based on the reviews (comments and scores) and the presentations during the conferences. Each selected paper must be substantially extended with at least 40% difference from its conference version.

2. Open Call-For-Papers

We also plan to publicize an open call-for-papers (CFP) by listing the CFP in major academic announcement mailing lists/websites and by sending the CFP to researchers in the areas around the world. We estimate there will be a number of submissions via the open CFPs. Then we plan to select another a few papers from the submissions. Each paper (including the selected papers from the conference) will go through a rigorous peer-review process by at least three international researchers. In total, we plan to include 10 - 15 papers in this special issue. The acceptance rate will be fairly low, but we regard quality as our top priority. The anticipated readers of this Special Issue include both academic and industrial researchers working in relevant areas of big data analytics and deep learning.

Important Dates

Submission Due	29 September 2017
1st Round Notification	5 January 2018
Final Notification	6 April, 2018
Publication	Fall 2018

Proposed Guest Editors

Professor Maozhen Li, Email: maozhen.li@brunel.ac.uk

Brunel University London, Uxbridge, UK

Professor Ladislav Hluchý, Email: ladislav.hluchy@savba.sk

Institute of Informatics, Slovak Academy of Sciences, Bratislava, Slovak

Dr. Lipo Wang, Email: elpwang@ntu.edu.sg

Nanyang Technological University, Singapore

Dr. Man Qi, Email: man.qi@canterbury.ac.uk

Canterbury Christ Church University, Canterbury, UK

Brief Biography of Guest Editors

Maozhen Li is a Full Professor in the Department of Electronic and Computer Engineering at Brunel University London. His research interests are in the areas of high performance computing technologies including cloud computing, smart grids, big data analytics, and intelligent systems. He has over 120 scientific publications in these areas including 3 books. He has served over 30 IEEE conferences. He is an Associated Editor of the Journal of Cloud Computing Advances, Systems and Applications, Springer, International Journal of Grid and High Performance Computing, International Journal of Distributed Systems and Technologies, and Computing and Informatics. In 2016, he successfully organised two Special Issues related to Big Data Analytics for two journals respectively - Concurrency and Computation: Practice and Experience (Wiley) and International Journal of Parallel Programming (Springer). He is a Fellow of the British Computer Society.

Selected Journal Publications

- W. Guo, N. K. Alham, Y. Liu, **M. Li** and M. Qi, *A Resource Aware MapReduce based Parallel SVM for Large Scale Image Classifications*, Neural Processing Letters, vol.44, no.1, pp.161-184, 2016.
- C. Deng, Y. Liu, L. Xu, J. Yang, J. Liu, S. Li and **M. Li**, *A MapReduce based Parallel K-Means Clustering for Large Scale CIM Data Verification*, Concurrency and Computation: Practice and Experience, vol.28, no.11, pp. 3096-3114, July 2016.
- M. Kan, Y. Jin, **M. Li**, Y. Xiang and C. Jiang, *Hadoop Performance Modeling for Job Estimation and Resource Provisioning*, IEEE Transactions on Parallel and Distributed Systems, vol.27, no.2, pp.441-454, February 2016.
- M. Khan, P. M. Ashton, **M. Li**, G. A. Taylor, I. Pisica and J. Liu, *Parallel Detrended Fluctuation Analysis for Fast Event Detection on Massive PMU Data*, IEEE Transactions on Smart Grid, vol.6, no.1, pp.360-368, January 2015.
- Y. Liu, **M. Li**, M. Khan and M. Qi, *A MapReduce based Distributed LSI for Scalable Information Retrieval*, Computing and Informatics, vol. 33, no. 2, pp. 259-280, June 2014.
- N. K. Alham, **M. Li** and Y. Liu, *Parallelizing Multiclass Support Vector Machines for Scalable Image Annotation*, Neural Computing and Applications, vol.24, no.2 pp. 367-381, January 2014, Springer.
- N. K. Alham, **M. Li**, Y. Liu and M. Qi, *A Distributed SVM Ensemble for Large Scale Image Classification and Annotation*, Computers and Mathematics with Applications, vol. 66, no. 10, pp. 1920-1934, December 2013, Elsevier Science.
- G. Caruana, **M. Li** and Y. Liu, *An Ontology Enhanced Parallel SVM for Scalable Spam Filtering*, Neurocomputing, vol. 108, PP. 45-57, May 2013, Elsevier Science.
- Y. Liu, **M. Li**, N. K. Alham, S. Hammoud, *HSim: A MapReduce Simulator in Enabling Cloud Computing*, Future Generation Computer Systems (FGCS), vol. 29, no.1, pp. 300-308, January 2013, Elsevier Science.
- S. Jan, **M. Li**, H. Al-Raweshidy, A. Mousavi, and M. Qi, *Dealing with Uncertain Entities in Ontology Alignment using Rough Sets*, IEEE Transactions on Systems, Man and Cybernetics, Part C: Applications and Reviews, vol. 42, no. 6, pp. 1600-1612, November 2012.

Ladislav Hluchý is a Professor and the Director of Institute of Informatics, Slovak Academy of Sciences, and also the Head of the Department of Parallel and Distributed Computing. He has over 150 publications in the areas of high performance computing, data mining and intelligent systems. He is the Editor-in-Chief of the journal of Computing and Informatics.

Selected Journal Publications

- G. T. Nguyen, V. Sipková, P. Krammer, **L. Hluchý**, M. Dobrucký, V. D. Tran, O. Habala, *Integrated System for Hydraulic Simulations*, Computing and Informatics 34(5): 1065-1088 (2015).
- M. Kvassay, **L. Hluchý**, et al. *A Novel Way of Using Simulations to Support Urban Security Operations*, Computing and Informatics 34(6): 1201-1233 (2015).
- E. Pajorová and **L. Hluchý**, *High Performance Computing with a big Data: 3D Visualization of the Research Results*, Research in Computing Science 102: 9-19 (2015).
- Z. Balogh, E. Gatia, **L. Hluchý** et al. *Agent-Based Cloud Resource Management for Secure Cloud Infrastructures*, Computing and Informatics 33(6): 1333-1355 (2014)
- B. M. Nguyen, V. D. Tran, **L. Hluchý**, *A Generic Development and Deployment Framework for Cloud Computing and Distributed Applications*, Computing and Informatics 32(3): 461-485 (2013).
- O. Habala, **L. Hluchý**, V. D. Tran, P. Krammer, M. Seleng, *Using Advanced Data Mining and Integration in Environmental Prediction Scenarios*, Computer Science (AGH) 13(1): 5-16 (2012).
- B. M. Nguyen, V. D. Tran, **L. Hluchý**, *Abstraction Layer for Development and Deployment of Cloud Services*. Computer Science (AGH) 13(3): 79-88 (2012).
- S. Dlugolinsky, M. Seleng, M. Laclavik, **L. Hluchý**, *Distributed Web-Scale Infrastructure for Crawling, Indexing and Search with Semantic Support*. Computer Science (AGH) 13(4): 5-20 (2012).

Wang Lipo is an Associate Professor in the School of Electrical & Electronic Engineering at Nanyang Technological University, Singapore. He received the BS degree from National University of Defense Technology, China, and the PhD degree from Louisiana State University, USA. In 1989, he was a postdoctoral fellow at Stanford University, USA. In 1990, he was a faculty member in the Department of Electrical Engineering, University College, ADFA, University of New South Wales, Australia. From 1991 to 1993 he was on the staff of the Laboratory of Adaptive Systems, National Institutes of Health, USA. From 1994 to 1997 he was a tenured faculty member at Deakin University, Australia. Since 1998, he has been Associate Professor at the School of EEE, NTU. He has published 200 papers in journals and conferences. He holds a U.S. patent in neural networks. He has authored 2 monographs and edited 20 books. His work has been cited 400 times in the ISI Web of Science by other researchers. He was keynote/plenary speaker for several international conferences. He is Associate Editor for IEEE Transactions on Neural Networks (since 2002), IEEE Transactions on Evolutionary Computation (since 2003), and IEEE Transactions on Knowledge and Data Engineering (since 2005). He is Area Editor of the Soft Computing journal (since 2002). He serves on the Editorial Board of 8 additional international journals. He was Vice President for Technical Activities

(2006-2007) and Chair of the Emergent Technologies Technical Committee (2004-2005), IEEE Computational Intelligence Society. He has been on the Governing Board of the Asia-Pacific Neural Network Assembly (APNNA) since 1999 and served as APNNA President in 2002/2003. He won the 2007 APNNA Excellent Service Award. He was Founding Chair of both the IEEE Engineering in Medicine and Biology Chapter Singapore and IEEE Computational Intelligence Chapter Singapore. He serves/served as General/Program/Steering Committee Chair for 15 international conferences and as Member of steering/advisory/organizing/program committees of over 150 international conferences.

Selected Journal Publications

- X. Bai, S. I. Niwas, W. Lin, B. F. Ju, C. K. Kwoh, **L. Wang** et al, *Learning ECOC Code Matrix for Multiclass Classification with Application to Glaucoma Diagnosis*, J. Medical Systems 40(4): 78:1-78:10 (2016).
- X. Hou, Y. Liu, W. L. Lim, Z. Lan, O. Sourina, W. M. Wittig, **L. Wang**, *CogniMeter: EEG-Based Brain States Monitoring*, Trans. Computational Science 28: 108-126 (2016).
- Z. Lan, O. Sourina, **L. Wang**, Y. Liu, *Real-time EEG-based emotion monitoring using stable features*, The Visual Computer 32(3): 347-358 (2016).
- L. Zhang, **L. Wang**, W. Lin, S. Yan, *Geometric Optimum Experimental Design for Collaborative Image Retrieval*, IEEE Trans. Circuits Syst. Video Techn. 24(2): 346-359 (2014).
- X. Bai, Y. Fang, W. Lin, **L. Wang**, B. F. Ju, *Saliency-Based Defect Detection in Industrial Images by Using Phase Spectrum*, IEEE Trans. Industrial Informatics 10(4): 2135-2145 (2014).
- Y. Li, N. Xiong, H. Wang, **L. Wang**, *Editorial: Special Issue on Recent Advances in Intelligent Techniques*, Int. J. Intell. Syst. 28(3): 201-202 (2013).
- L. Zhang, **L. Wang**, W. Lin, *Semisupervised Biased Maximum Margin Analysis for Interactive Image Retrieval*, IEEE Trans. Image Processing 21(4): 2294-2308 (2012).

Man Qi is a Senior Lecturer in Computing at Canterbury Christ Church University, UK. Her research is focused on big data analytics, context aware knowledge mining and forensic computing. She has 70 publications in these areas including over 20 peer-reviewed journal papers. She has been researching context aware fast machine learning techniques for motion detection in surveillance videos based on big data computing technologies. She works closely with the Center of Cyber-forensics and also the Center of Policing Research at Canterbury Christ Church University to investigate the use of surveillance video footage as forensic evidence. She is a Fellow of the British Computer Society and also a Fellow of the Higher Education Academy.

Selected Journal Publications

- **M Qi**, *Facilitating visual surveillance with motion detections*, Concurrency and Computation: Practice and Experience (in press, DOI: 10.1002/cpe.3770)
- K. Cheng, Y. Zhan and **M. Qi**, *AL-DDCNN: A distributed crossing semantic gap learning for person re-identification*, Concurrency and Computation: Practice and Experience (in press, DOI: 10.1002/cpe.3766)
- W. Guo, N. K. Alham, Y. Liu, M. Li and **M. Qi**, *A Resource Aware MapReduce based Parallel SVM for Large Scale Image Classifications*, Neural Processing Letters, vol.44, no.1, pp.161-184, 2016.

- Y. Liu, J. Yang, Y. Huang, L. Xu, S. Li and **M. Qi**, *MapReduce based Parallel Neural Networks in Enabling Large Scale Machine Learning*, Computational Intelligence and Neuroscience, pp.1-13, 2015.
- S. Jan, M. Li, H. S. Al-Raweshidy, A. Mousavi and **M. Qi**, *Dealing With Uncertain Entities in Ontology Alignment Using Rough Sets*, IEEE Transactions on Systems, Man, and Cybernetics, Part C, vol. 42, no. 6, pp.1600-1612, 2012.