

## Editorial for Special Issue on ICONIP 2013

Minho Lee · Andrew Chi-Sing Leung

Published online: 21 February 2015  
© Springer Science+Business Media New York 2015

It has been over 20 years since the first International Conference on Neural Information Processing (ICONIP) held in Seoul, Korea. ICONIP2013 was held in Daegu, Korea, during November 3–7, 2013. ICONIP is the annual conference of the Asia Pacific Neural Network Assembly (APNNA). The aim of this conference series is to provide a platform for the community to present their latest results and to discuss research directions in the field of neural information processing. ICONIP 2013 received more than 400 submissions from 30 countries and regions across six continents. On the basis of a scrupulous peer review process, where each submission was evaluated by at least two qualified reviewers, about 180 high-quality papers were selected for oral presentations.

This special issue is aimed at disseminating the latest development of learning algorithms and neural networks. The papers solicited here are selected from papers presented in the ICONIP2013. Six extended papers are included in this issue and each of them has gone through an additional peer review process. They were evaluated by at least two additional qualified reviewers. We include the papers with the best representation and achievement in their respective fields:

- (1) “Learning Imbalanced Classifiers Locally and Globally with One-Side Probability Machine” considers the imbalanced data set situation, where data samples in one class are much fewer than those in another class. Unlike some traditional methods, the proposed method does not duplicate or remove samples from data sets. Besides, it exploits the reliable global information from the majority class only, while engaging the robust local learning from the minority class.
- (2) “Self-Organizing Map (SOM) based Data Navigation for Identifying Shape Similarities of Graphic Logos” propose two approaches to enhance existing SOM based data

---

M. Lee  
Kyungpook National University, Daegu, Korea

A. C.-S. Leung (✉)  
City University of Hong Kong, Kowloon Tong, Hong Kong  
e-mail: eeleungc@cityu.edu.hk

- visualization methods for better data navigation. With the two approaches, the local information, as well as global ordering can be visualized on the same map.
- (3) “GPU Accelerated Self-Organizing Map for High Dimensional Data” proposes a GPU implementation of SOM training. It proposes an auxiliary vertices generation scheme and a tiled codebook structure in texture array to handle training vectors of arbitrary dimension and codebook of large size. In addition, to further improve the speed, the accumulation of training vectors is considered as vertex color blending. Therefore, so that the serialized operations in the SOM update process are eliminated by utilizing the point size control in rendering shaders.
  - (4) “Statistically Adaptive Image Denoising based on Overcomplete Topographic Sparse Coding” proposes the optimization procedure on image denoising based on overcomplete topographic sparse coding (OTSC) model. The ideas to improve the denoising model, includes multi-category based sparse coding, adaptive learning, local normalization, lasso shrinkage function, and subset selection.
  - (5) “Estimation of Lower Limb Periodic Motions from sEMG using Least Squares Support Vector Regression” uses the least squares support regression (LS-SVR) approach to predict human lower limb periodic motions from multi-channel surface Electro Myo Gram (sEMG).
  - (6) “Graph Based Semi-Supervised Learning via Structure Preserving Low-Rank Representation” proposes a new graph construction model for graph based semi-supervised classification. The proposed approach introduces two constraints on the low rank representation (LRR) model local affinity and distant repulsion. Hence, the LRR coefficients can well reflect the geometrical structure involved in data set.

With these selected papers, we hope that this special issue will serve its purpose of advancing our understanding in the field. We would like to thank all the contributors of papers who were kind enough to go through the additional process of blind review and our reviewers for their time. We are grateful to all those people behind this endeavor.