Editorial

Mingyu You and Guo-Zheng Li

Department of Control Science and Engineering,
Tongji University,
Shanghai 201804, China
E-mail: myyou@tongji.edu.cn
E-mail: gzli@tongji.edu.cn

Mary Qu Yang

Department of Health and Human Services,
United States National Human Genome Research Institute,
National Institutes of Health,
Bethesda, MD 20852, USA, and Oak Ridge, DOE, USA
E-mail: yangma@mail.NIH.gov

Biographical notes: Mingyu You is a Lecturer in the Department of Control Science and Engineering of Tongji University in China. She received her BS in 2002 and PhD in 2007, both from Zhejiang University, China. Her research interests include artificial intelligence, data mining, development of intelligent systems in traditional Chinese medicine, human computer interaction and emotion recognition. In the past several years, she has published over ten refereed papers in several professional journals and academic conferences. She was a Vice Organising Chair of IJCBS and invited reviewer for a number of international journals and conferences.

Guo-Zheng Li received his PhD from Shanghai JiaoTong University in 2004. He is currently an Associate Professor with the Department of Control Science and Engineering of Tongji University in China. He is serving on the Committees at CCF Artificial Intelligence and Pattern Recognition Society, CAAI Machine Learning Society, International Society of Intelligent Biological Medicine and IEEE Computer Society. His research interests include feature selection, design of classifiers, machine learning in bioinformatics, traditional Chinese medicine and other intelligent applications. In recent years, he has published over 50 refereed papers in prestigious journals and conferences. He is Editor on board of IJDMB, IJAISC, IJFIPM, IJCBDD, JETWI and IJCIBSB and programme chair of IJCBS 2009.

Mary Qu Yang received her MSECE, MS and PhD, all from Purdue University, and post-doctoral training from NIH and Oak Ridge, DOE. She was a recipient of the Outstanding Interdisciplinary Bilsland Dissertation Fellow for Computer Engineering and Biophysics Dual Degrees and NIH Fellow for the National Human Genome Research. She brings over 15 years of unique multidisciplinary strength to her current work at the United States National Human Genome Research Institute, where she has played important roles in a number of international large-scale projects. Her work on ENCODE (The Encyclopedia of DNA Elements) deals with the identification of bidirectional promoters and their association with cancer genes; she discovered over 5000 novel regulatory regions. Her work on the Bovine Genome Sequencing project deals with mapping bidirectional promoters from

humans to mammalians, birds and fish; she discovered over 1000 orthologous regulatory regions across seven species. She works in both translational biomedical research and engineering practice, she published over 100 original research, engineering practice, scientific review, introductory and editorial articles, among which over 30 of her papers are indexed at PubMed and over 50 of her papers are indexed at DBLP. She is Editor-in-Chief of *International Journal of Computational Biology and Drug Design*, and is on editorial board of over a dozen journals and proceeding books. She specialises in genomics and high-performance computing.

Traditional Chinese Medicine (TCM) has been widely practiced for tens of centuries in China. It is still one of the main medical systems in East Asia nowadays. Besides, it is gaining more acceptances in western world. Researches on TCM and herbal medicine attract more scientists. To provide a platform for researchers and TCM practitioners to communicate and share their excellent ideas, the International Workshop on Bioinformatics and Systems Biology in Traditional Chinese Medicine Research in conjunction with the 2009 International Joint Conferences on System Biology, Bioinformatics and Intelligent Computing (IJCBS2009) was held at Shanghai, China on August 3rd 2009. In the workshop, eight experts in TCM researches present their achievements and prospect the future of TCM informatics. Heated discussion is raised the whole afternoon in the workshop. A wider range of researchers pay close attention to the workshop and the progress in TCM. Due to limited time of the workshop, more scientists and related researchers have no chance to present their valuable work in the TCM workshop.

This special issue is to bring together the latest/innovative research works in TCM, especially in TCM informatics. The presenter in the TCM workshop and some other experts are invited to propose their precious achievement. The first paper 'Report of 2009 International Workshop on Bioinformatics and Systems Biology in Traditional Chinese Medicine Research' by Dan Xi and Su-Shing Chen introduces the International Workshop on Bioinformatics and Systems Biology in Traditional Chinese Medicine Research in conjunction with the 2009 International Joint Conferences on System Biology, Bioinformatics and Intelligent Computing (IJCBS2009). It discusses and summarises the scientific talks and achievements presented at the workshop and the impact of this workshop. The second paper 'Mutual understanding between Traditional Chinese Medicine and systems biology: gaps, challenges and opportunities' by Dong Xu compares TCM and systems biology in detail. It summarises four similarities and five differences between TCM and systems biology. Besides, five examples are given in the paper to show how ongoing research help reconcile between CWM and TCM. The third paper 'The logic of YinYang and the science of TCM: An eastern road to the unification of nature, agents and medicine' by Wen-Ran Zhang unveils the silent nature of YinYang related to Greek philosophy and identifies its critical role in logic, TCM, and modern science. It is shown that YinYang bipolar relativity has opened an eastern road toward quantum gravity, which is Einstein's unfinished scientific unification of general relativity and quantum mechanics. The fourth paper 'A multitier YinYang-N-element cellular architecture for the Chinese meridian system' by Wen-Ran Zhang, Su-Shing Chen and Hongzhao Zang proposes a multitier YinYang-N-Element cellular architecture for

the Chinese meridian system as a platform for elaboration. It discusses the theoretical and experimental aspects of the Chinese meridian system based on this platform.

In addition to these systemic discussions of TCM, detailed implementations of TCM informatics are also included. The fifth paper 'Computer-aided disease diagnosis system in TCM based on facial image analysis' by Xiaoqiang Li, Fufeng Li, Yiqin Wang, Peng Qian and Xiaoyan Zheng illustrated a novel Computer Aided Disease Diagnosis System (CADDS), acquiring the facial complexion information based on analysing image captured by digital camera. CADDS is developed for assistant facial diagnosis, which standardises the process of acquiring. Tongue contour segmentation is premise and difficult in automatic tongue diagnosis in TCM. The sixth paper 'A novel segmentation of tongue image' by Wenshu Li, Shenning Hu, Hongting Li and Song Wang introduces a novel method for tongue contour extraction based on improved level set curve evolution. The seventh paper 'Nonlinear analysis of auscultation signals in Traditional Chinese Medicine using Wavelet Packet Transform and Approximate Entropy' by Jianjun Yan, Yong Shen, Yiqin Wang, Fufeng Li, Chunming Xia, Rui Guo, Chunfeng Chen, Zhongyan Gu and Xiaojing Shen analyses the auscultation signals in TCM utilising WPT and approximate entropy (ApEn). A new scheme is presented for analysing the Auscultation Signals consisted of qi-deficient, yin-deficient and normal people.