Preface

Fourth Workshop on Biological Data Mining and its Applications in Healthcare

BioDM 2013

The biologists are stepping up their efforts to understand the biological processes that underlie disease pathways. This has resulted in a flood of biological and clinical data from genomic sequences, DNA microarrays, and protein interactions, to biomedical images, disease pathways, and electronic health records. We are in a situation where our ability to generate biomedical data has greatly surpassed our ability to mine and analyze the data.

We can expect data mining to play an increasingly crucial role in furthering biological research, since data mining is designed to handle challenging data analysis problems. In fact, it is our hope that data mining will be the next technical innovation employed by biologists to enable them to make insightful observations and groundbreaking discoveries from their wide array of heterogeneous data from molecular biology to pharmaceutical and clinical domains.

There are still many fundamental data analysis challenges to be overcome in order to discover new knowledge from the biomedical data to translate into clinical applications. These include practical issues such as handling noisy and incomplete data (e.g. protein interactions have high false positive and false negative rates), processing compute-intensive tasks (e.g. large scale graph mining), and integrating heterogeneous data sources (e.g. linking genomic data, proteomics data with clinical databases).

This is an unprecedented opportunity for data mining researchers from the computer science domain to contribute to the meaningful scientific pursuit together with the biologists and clinical scientists. The inaugural, second and third ICDM workshops on Biological Data Mining and its Applications in Healthcare (BioDM 2010 at Sydney Australia, BioDM 2011 at Vancouver Canada, BioDM 2012 at Brussels Belgium) were organized to facilitate the dissemination of the research results and best practices of data mining approaches to the cross-disciplinary researchers and practitioners from both the data mining disciplines and the life sciences domains.

For this fourth workshop, we encourage submission of papers describing the design and use of data mining techniques to address the various challenging issues in biological data analysis. We particularly welcome paper submissions that report the development of data mining techniques in healthcare-related applications that integrate the use of biological data in a clinical context for translational research. The workshop, held in Dallas Texas USA on December 7, 2013, has received a total of 15 paper submissions, out of which 7 were selected for presentation at the workshop.

We would like to thank all the authors who have submitted their papers on many exciting and important research topics. Our heartfelt thanks go to PC members and the external reviewers for their hard work. We also thank the presenters of the accepted papers. Last but not least, we thank all the workshop participants for attending this fourth workshop in Dallas Texas USA. It is our hope that the workshop will
provide a lasting platform for disseminating the latest research results and practice of the data mining approaches in biology and healthcare.

Looking forward to meeting you in USA!

**Workshop Co-Chairs**

Xiaoli Li, *Institute for Infocomm Research, A*Star, Singapore*

See-Kiong Ng, *Institute for Infocomm Research, A*Star, Singapore*

Jason T. L. Wang, *New Jersey Institute of Technology, USA*

Andrea Bertotti, *University of Torino, Italy*

Alessandro Fiori, *Institute for Cancer Research and Treatment (IRCC) of Candiolo, Italy*