

2014 IEEE Conference on Computational Intelligence in Bioinformatics and Computational Biology Agenda

Wednesday, May 21

9:30AM-11:30AM

Tutorial: Using Data From Model Organisms In Bioinformatic Research

Room: South Pacific Ballroom #1, Instructor: Wendy Ashlock

This tutorial will start with a basic introduction to molecular biology from a computer science perspective. Included will be information about technologies for sequencing genomes as well as more recent technologies created for studying epigenomes. Understanding epigenomes is vital to understanding gene regulation. Epigenomes consist of chemical compounds that have been added to genomes that are heritable and that affect gene regulation. Information will be presented about data available for specific model organisms. The focus will be on the single-celled animal, *Tetrahymena thermophila*. Also, discussed will be yeast, fruit flies, and human beings. Important discoveries about basic processes that have been discovered using model organisms will be presented. The tutorial will end with a discussion of the pros and cons of studying model organisms for the purpose of greater understanding of biological processes that relate to all or many organisms.

11:30AM-1:00PM

Lunch Break

1:00PM-2:30PM

Tutorial: Representation in Bioinformatics

Room: South Pacific Ballroom #1, Instructor: Daniel Ashlock

This tutorial will cover a variety of techniques for representing bioinformatic problems for evolutionary computation and other search methods. Each representation covered will be accompanied by at least one bioinformatic problem that it can be used to solve and the problem will be explained in some detail. Problems will include single nucleotide polymorphisms, bi-clustering, sequence classification, motif selection, and fault tolerant marker creation. Representations will include simple linear representations, state conditioned representations such as side effect machines, simple generative representations for marker location and complex generative representations such as woven string kernels. The tutorial will discuss features and feature selection to some degree.

2:30PM-3:00PM

Break

Room: South Pacific Lounge

3:00PM-4:30PM

Roundtable: Future Directions in Computational Intelligence in Bioinformatics Research

Room: South Pacific Ballroom #1

Panelists: Daniel Ashlock, Jennifer Hallinan, Hiroshi Mamitsuka

6:00PM-8:00PM

Opening Reception

Room: Rainbow Suite 1-2 / Patio

Thursday, May 22

8:00AM-8:10AM

Opening Remarks,

Room: South Pacific Ballroom #1

8:10AM-9:10AM

Plenary Talk: Keynote

Room: South Pacific Ballroom #1, Speaker: Hiroshi Mamitsuka

9:10AM-9:30AM

Break

Room: South Pacific Lounge

9:30AM-11:30AM: Modeling and Simulation

Room: South Pacific Ballroom #1

Neutral graph of regulatory Boolean networks using evolutionary computation [#45]

Gonzalo Ruz and Eric Goles, Universidad Adolfo Ibanez, Chile

Modified Roach Infestation Optimization [#3]

Ibidun Obagbuwa and Aderemi Adewumi, School of Mathematics, statistics and computer science, University of KwaZulu-Natal, South Africa

Arithmetic computation in the tile assembly model: inversion over finite field $GF(2^n)$ [#21]
Yongnan Li and Xiao Limin, Beihang University, China

Tuning Receiver Characteristics in Bacterial Quorum Communication: An Evolutionary Approach Using Standard Virtual Biological Parts [#35]

Agent-based Modelling of Resource Flow in Plant Networks [#49]
Daniel Ashlock and Asena Goren, University of Guelph, Canada

11:30AM-1:00PM

Lunch Break

1:00PM-2:40PM: Pattern Recognition

Room: South Pacific Ballroom #1

Automatic Identification of Head and Neck Swellings in MRI Images Using Support Vector Machines Based On Cepstral Analysis [#12]

Gamal Gouid, A. abed elmeneeam Nasser, M.Zakaria Mostafa and D. Mohamed Ehenawy, Electrical Engineering Department, Faculty of Engineering, Alexandria University, Egypt, Egypt; Arab Academy for Science and Technology and Maritime Transports, Alexandria, Egypt, Egypt; Faculty of Medicine, Suez Canal University, Egypt, Egypt

*A Machine learning approach for detecting MAP kinase in the genome of *Oryza sativa* L. ssp. indica [#25]*

Hemalatha Nambisan, Rajesh M.k and Narayanan N.k, AIMIT, St.aloysius college, Mangalore, India; Central plantation crops research institute, Kasargod, India; School of information science and technology, Kannur, India

Wrist Pulse Signals Analysis based on Deep Convolutional Neural Networks [#41]

XiaoJuan Hu, HongHai Zhu, JiaTuo Xu, DongRong Xu and Jun Dong, Institute of Nano-Tech and Nano-Bionics, Chinese Academy of Sciences, China; School of Basic Medical, Shanghai University of Traditional Chinese Medicine, China; MRI Unit and Epidemiology Division, Department of Psychiatry, Columbia University, United States

Dental Fluorosis Classification Using Multi-prototypes from Fuzzy C-Means Clustering [#52]

Uklid Yeesarapat, Sansanee Auephanwiriyaikul, Nipon Theera-Umpon and Chatpat Kongpun, Computer Engineering Dept., Faculty of Engineering, Chiang Mai University, Thailand; Electrical Engineering Dept., Faculty of Engineering, Chiang Mai University, Thailand; Intercountry Centre for Oral Health, Chiang Mai, Thailand

2:40PM-3:00PM

Coffee and Tea Break

Room: South Pacific Lounge

3:00PM-4:30PM

Sequencing

Thursday, May 22, 3:00PM-4:30PM, Room: South Pacific Ballroom #1

Recentering and Restarting Genetic Algorithms Variations for DNA Fragment Assembly [#6]
James Hughes, Sheridan Houghten, Guillermo Mallen-Fullerton and Daniel Ashlock, Brock University, Canada; Universidad Iberoamericana, Mexico; University of Guelph, Canada

Side Effect Machine Features For Analysis And Comparison Of DNA Promoter Sequences [#42]
Wendy Ashlock, York University, Canada

BLKnn: A Novel K-Nearest Neighbor Method For Predicting Bioluminescent Proteins [#9]
Jing Hu, Franklin and Marshall College, United States

Shape Control of Side Effect Machines for DNA Classification [#34]
Andrew McEachern and Daniel Ashlock, University of Guelph, Canada

6:00PM-9:00PM

Banquet Dinner

Room: Rainbow Suite 1-2 / Patio

Friday, May 23

8:00AM-9:10AM

Gene Expression

Room: South Pacific Ballroom #1

Extending Multi-Label Feature Selection with KEGG Pathway Information for Microarray Data Analysis [#7]

Suwimol Jungjit, Alex Freitas, Martin Michaelis and Jindrich Cinatl, School of Computing, University of Kent, Canterbury, CT2 7NF, UK, United Kingdom; School of Biosciences, University of Kent, Canterbury, CT2 7NJ, UK, United Kingdom; Institut fuer Medizinische Virologie, Klinikum der Goethe-Universitaet, Paul Ehrlich-Str. 40, 60596 Frankfurt am Main, Germany, Germany

A Markov random field-based Bayesian model to identify genes with differential methylation [#27]

Xiao Wang, Jinghua Gu, Robert Clarke, Leena Hilakivi-Clarke and Jianhua Xuan, Virginia Tech University, United States; Georgetown University Medical Center, United States

Gaussian derivative wavelets identify dynamic changes in histone modification [#51]

Nha Nguyen and Kyoung-Jae Won, University of Pennsylvania, United States

9:10AM-9:30AM

Coffee and Tea Break

Room: South Pacific Lounge

9:30AM-11:30AM**Data Modeling and Mining**

Room: South Pacific Ballroom #1

Biomedical (Cardiac) Data Mining: Extraction of significant patterns for predicting heart condition [#5]

Mamuna Fatima, Iqra Basharat, Ali Raza Anjum and Dr Shoaib Ahmed, NUST, Pakistan; MOBILINK, Pakistan

Bayesian ARTMAP Prediction of Biological Activities for Potential HIV-1 Protease Inhibitors using A Small Molecular Dataset [#14]

Razvan Andonie, Levente Fabry-Asztalos and Lucian Sasu, Central Washington University, United States; Transilvania University of Brasov, Romania

Incorporating Prior Expert Knowledge In Learning Bayesian Networks From Genetic Epidemiological Data [#17]

Latent Dirichlet Allocation based on Gibbs Sampling for Gene Function Prediction [#26]

Pietro Pinoli, Davide Chicco and Marco Masseroli, Politecnico di Milano, Italy; University of California Irvine, United States

Discovering Objective Functions for Tagging Medical Text Concepts [#44]

George Shannon, Steven Corns and Donald Wunsch, Missouri University of Science and Technology, United States

11:30AM-1:00PM**Lunch Break****1:00PM-2:40PM****Structure Prediction and Folding**

Room: South Pacific Ballroom #1

A Model Based on Minimotifs for Classification of Stable Protein-protein Complexes [#18]

Luis Rueda and Manish Pandit, University of Windsor, Canada

ROSS : A Rapid Protein Structure Alignment Algorithm [#23]

Ahmed Fadel, Mohamed Belal and Mostafa-Sami Mostafa, Faculty of Computers and Information Helwan University, Egypt

Modeling Metal Protein Complexes from Experimental Extended X-ray Absorption Fine Structure using Evolutionary Algorithms [#40]

Collin Price, Sheridan Houghten, Sergey Vassiliev and Doug Bruce, Brock University, Canada

Inferring the Relationships among Genes from Weighted GO Graph [#43]
Kamal Taha and Paul Yoo, Khalifa University, United Arab Emirates

Friday, May 23, 2:40PM-3:00PM

Coffee and Tea Break

Room: South Pacific Lounge

Friday, May 23, 3:00PM-4:30PM

Analysis and Visualization

Room: South Pacific Ballroom #1

Multiclass unbalanced protein data classification using sequence features [#31]
Suvarna vani Koneru and Divya sravani Thanikonda, VRSiddhartha Engineering College, Autonomus, India; rtha Engineering College, Autonomus, India

Frequent substructures and fold classification from protein contact maps [#32]
Suvarna vani Koneru, Om swaroopa Madu and Divya sravani Thanikonda, rtha Engineering College, Autonomus, India

Low noise microelectrode array signal headstage pre-amplifier for in-vitro neuron culture [#38]
Francisco Fambrini, Jose Hiroki Saito and Marco Antonio Barreto, Faccamp, Brazil; UFSCar, Brazil

Using Associators To Generate Ensemble Biclustering From Multiple Evolved Biclusterings [#46]

Daniel Ashlock and Eun-Youn Kim, University of Guelph, Canada; Korean Research Institute for Bioscience and Biotechnology, Korea (South)

Saturday, May 24

8:00AM-9:10AM

Biomedical Applications

Room: South Pacific Ballroom #1

Position Control of Head and Neck Swellings Resection Operation using Artificial Neural Networks [#22]

Gamal Gouid, A. abed elmeneeam Nasser, M.Zakaria Mostafa and D. Mohamed Ehenawy, Electrical Engineering Department, Faculty of Engineering, Alexandria University, Egypt, Egypt; Arab Academy for Science and Technology and Maritime Transports, Alexandria, Egypt, Egypt; Faculty of Medicine, Suez Canal University, Egypt, Egypt

Application of modulation spectrum for IEEG seizure analysis [#39]

Otis Smart, Nashlie Sephus and Robert Gross, Emory University, United States; Georgia Institute of Technology, United States

An eLORETA EEG analysis to spatially resolve real and imagined neuromotor control [#47]

Ankit Kaushik and Otis Smart, Georgia Institute of Technology, United States; Emory University, United States

Saturday, May 24, 9:10AM-9:30AM

Coffee and Tea Break

Room: South Pacific Lounge

Saturday, May 24, 9:30AM-11:00PM

Biomedical Applications

Room: South Pacific Ballroom #1

Predicting the severity of motor neuron disease progression using electronic health record data with a cloud computing Big Data approach [#16]

Kyung Dae Ko, Dongkyu Kim, Tarek El-Ghazawi and Hiroki Morizono, High-Performance Computing Laboratory (HPCL) at The George Washington University, United States; Center for Translational Science at Children's National Medical Center, United States; Center for Genetic Medicine at Children's National Medical Center, United States

Predictive Pattern Analysis using SOM in medical data sets for Medical Treatment Service [#24]

Young Sung Cho and Keun Ho Ryu, Chungbuk National University, Korea (South)

MetaPathways v2.0: A master-worker model for environmental Pathway/Genome Database construction on grids and clouds [#28]

Niels W. Hanson, Kishori M. Konwar, Shang-Ju Wu and Steven J. Hallam, Graduate Program in Bioinformatics, University of British Columbia, Canada; Department of Microbiology and Immunology, University of British Columbia, Canada

Predictive Modeling of Lung Cancer Recurrence using Alternative Splicing Events versus Differential Expression Data [#36]

Paul Anderson, Matt Paul, Victoria McCaffrey, Robert Wilson, E. Star Hazard, Chadrick Denlinger, Patricia Watson and Dennis Watson, College of Charleston, United States; Medical University of South Carolina, United States

Saturday, May 24, 11:00PM-11:10PM

Closing Remarks

Room: South Pacific Ballroom #1