

# Contents

## SESSION: BIOINFORMATICS DATABASE, DATA MINING, AND PATTERN DISCOVERY

|                                                                                                                                                                                         |           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>Change Point Detection Via Sub-Gaussian Fitting</b>                                                                                                                                  | <b>3</b>  |
| <i>Adam Hoover, Anirud Singh, Stephanie Fishel-Brown, Eric Muth</i>                                                                                                                     |           |
| <b>Data Mining Approaches for Genome-Wide Association of Mood Disorders</b>                                                                                                             | <b>10</b> |
| <i>Mehdi Pirooznia, Fayaz Seifuddin, Jennifer Judy, Pamela B. Mahon, James B. Potash, Peter P. Zandi</i>                                                                                |           |
| <b>Discovery of Enriched Biological Motifs Using Knowledge Priors with Application to Biohydrogen Production</b>                                                                        | <b>17</b> |
| <i>William Hendrix, Andrea Rocha, Mark Elmore, Joe Trien, Nagiza Samatova</i>                                                                                                           |           |
| <b>A New Bioinformatics Tool for Prediction with Confidence</b>                                                                                                                         | <b>24</b> |
| <i>Dmitry Devetyarov, Martin Woodward, Nicholas Coldham, Muna Anjum, Alex Gammernan</i>                                                                                                 |           |
| <b>Identification of Transmembrane <math>\alpha</math>-Barrel Proteins Using a K-Nearest Neighbor Method Based On Weighted Manhattan Distance</b>                                       | <b>29</b> |
| <i>Jing Hu</i>                                                                                                                                                                          |           |
| <b>Mining Minimum Generalized Set Based on Multiple Alignments from Mismatch Cluster</b>                                                                                                | <b>35</b> |
| <i>Kazuya Miyahara, Hajime Kitakami, Yoshifumi Takahashi, Keiichi Tamura, Susumu Kuroki</i>                                                                                             |           |
| <b>A Fast Algorithm for Detecting Genes Controlled by RNAi by Degradation Technique</b>                                                                                                 | <b>42</b> |
| <i>Mohammad Abdel-Rahman, Aliaa Youssif, Fayed Ghaleb, Abdel-Badeeh Salem</i>                                                                                                           |           |
| <b>Applications of Machine Learning Methods to Quantifying Phenotypic Traits that Distinguish the Wild Type from the Mutant Arabidopsis Thaliana Seedlings during Root Gravitropism</b> | <b>49</b> |
| <i>Hesam Dashti, Jernej Tonejc, Adel Ardalan, Alireza Siahpirani, Sabrina Guettes, Zohreh Sharif, Liya Wang, Amir Assadi</i>                                                            |           |
| <b>A Network-based Approach to Classify Disease Stages of Prostate Cancer Using Quantitative Network Measures</b>                                                                       | <b>55</b> |
| <i>Laurin AJ Mueller, Karl G Kugler, Andreas Dander, Christian Baumgartner, Armin Graber, Matthias Dehmer</i>                                                                           |           |
| <b>A Novel Majority Vote Count Algorithm for Integrative Analysis of Association Networks</b>                                                                                           | <b>62</b> |
| <i>Karl Kugler, Laurin Mueller, Ralf Gallasch, Armin Graber, Matthias Dehmer</i>                                                                                                        |           |
| <b>Application of Machine Learning Algorithms for Binning Metagenomic Data</b>                                                                                                          | <b>68</b> |
| <i>Vasim Mahamuda, Manchon U, Rasheed Khaled</i>                                                                                                                                        |           |

|                                                                                                                                    |            |
|------------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>Clustering using Positional Association Rules Algorithm on Protein Sequence Motifs</b>                                          | <b>75</b>  |
| <i>Bernard Chen, Michael Miller, Timothy Montgomery, Terrance Griffin</i>                                                          |            |
| <b>Fitting Probit Regression using Functional Gradient Ascent for Cancer Classification</b>                                        | <b>81</b>  |
| <i>Songfeng Zheng, Weixiang Liu</i>                                                                                                |            |
| <b>Suggested Hybrid Approach for Robust Classification of EEG Data for Brain Computer Interface</b>                                | <b>87</b>  |
| <i>Ijaz Ali Shoukat, Mohsin Iftikhar</i>                                                                                           |            |
| <b>Comparative Analysis of the Computational Methods used in Protein Structure Prediction</b>                                      | <b>98</b>  |
| <i>Umair Khan, Humaira Qureshi</i>                                                                                                 |            |
| <b>Improving Survival Rates Using Data Mining</b>                                                                                  | <b>104</b> |
| <i>Manasi Raddi, Manasi Pandire, Radha Shankarmani, Kailas Devadkar</i>                                                            |            |
| <br><b>SESSION: MICROARRAY, GENE EXPRESSION ANALYSIS, AND GENE REGULATORY NETWORKS</b>                                             |            |
| <b>Gene Regulatory Network Reconstruction Based on Gene Expression and Transcription Factor Activities</b>                         | <b>113</b> |
| <i>Yao Fu, Laura Jarboe, Julie Dickerson</i>                                                                                       |            |
| <b>Computational Identification of Human Tissue-Specific Genes Using Public Microarray Expression Data</b>                         | <b>120</b> |
| <i>Liangjiang Wang</i>                                                                                                             |            |
| <b>The Length Distributions of Non-coding and Coding Sequences in Relation to Gene Expression: A Study on Arabidopsis thaliana</b> | <b>127</b> |
| <i>Rachel Caldwell, Jinda Kongcharoen, Yan-Xia Lin, Ren Zhang</i>                                                                  |            |
| <b>Can Graph Motifs Capture the Functions of a Complex Network?</b>                                                                | <b>134</b> |
| <i>Venu Murthy, Edayathu Krishnamurthy</i>                                                                                         |            |
| <b>Normalized Microarrays for Analysis and Prediction (NMAP): An SOA Solution for Biomedical Research</b>                          | <b>140</b> |
| <i>Manu Sheel Gupta, Pragma Goel</i>                                                                                               |            |
| <b>Median Boost for Cancer Classification with Gene Expression Data</b>                                                            | <b>146</b> |
| <i>Songfeng Zheng, Weixiang Liu</i>                                                                                                |            |
| <b>Gene Expression Analysis of Genes Involved in Bypassing Cellular Senescence in Prostate Cancer</b>                              | <b>152</b> |
| <i>Neha Puri, Niravath Geethu Issac, Shipra Vinodkumar Gupta, Kushagra Srivastava</i>                                              |            |

# SESSION: PROTEIN CLASSIFICATION AND STRUCTURE PREDICTION, EVOLUTIONARY, AND COMPUTATIONAL MOLECULAR AND STRUCTURAL BIOLOGY

|                                                                                                                                            |            |
|--------------------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>Local Phase Quantization Texture Descriptor for Protein Classification</b>                                                              | <b>159</b> |
| <i>Sheryl Brahnem, Loris Nanni, Jian-Yu Shi, Alessandra Lumini</i>                                                                         |            |
| <b>Effectively Integrating Information Content and Structural Relationship to Improve the GO-based Similarity Measure Between Proteins</b> | <b>166</b> |
| <i>Bo Li, Feng Luo, James Z. Wang, Frank Alex Feltus, Jizhong Zhou</i>                                                                     |            |
| <b>Detection of Alternative Splicing based on Reduced Amino Acid Alphabet</b>                                                              | <b>173</b> |
| <i>Minseo Park</i>                                                                                                                         |            |
| <b>Multiple Alignment of Large Interaction Networks by Fast Identifying Maximal Conserved Patterns</b>                                     | <b>178</b> |
| <i>Wenhong Tian, Matthew C. Schmidt, Wenbin Chen, Nagiza F. Samatova</i>                                                                   |            |
| <b>Extraction of Protein Sequence Motifs Information by Bi-Clustering Algorithm</b>                                                        | <b>185</b> |
| <i>Vincent Yip, Bernard Chen, Sinan Kockara</i>                                                                                            |            |
| <b>A Bayesian Phylogenetic Analysis of an Early Avian-Line Radiation</b>                                                                   | <b>191</b> |
| <i>Jack Horner</i>                                                                                                                         |            |
| <b>Protein Sequence Motif Information Generated by Fuzzy - Hybrid Hierarchical K-means Clustering Algorithm</b>                            | <b>198</b> |
| <i>Bernard Chen, Christopher Rhodes, Christopher Kline, Luke Irvin</i>                                                                     |            |
| <b>A Multi-Objective Evolutionary Approach for Haplotype Inference</b>                                                                     | <b>202</b> |
| <i>Priyadarshini Lakshminarasimhan, Qi Liu, Robert Marmelstein, Mary Devito, Dongsheng Che</i>                                             |            |
| <b>Predicting Membrane Proteins Type Using Inter-domain Linker Knowledge</b>                                                               | <b>209</b> |
| <i>Nazar Zaki, Wassim El-Hajj</i>                                                                                                          |            |
| <b>Intrinsic Contact Geometry of Protein Dynamics</b>                                                                                      | <b>215</b> |
| <i>Yosi Shibberu, Mark Brandt, David Cooper</i>                                                                                            |            |
| <b>Protein Sequence Alignment Algorithm Based on Hybrid Profile Information</b>                                                            | <b>220</b> |
| <i>Yan Jia, Ziyang Chen, Xuan Wang, Fa Zhang</i>                                                                                           |            |

|                                                                                                                                                                                          |     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>Kernelling Method for Identifying Near-Native Protein Decoy Structures</b>                                                                                                            | 225 |
| <i>Xiuping Tao, Andrew Bordner, Thomas Schulthess, Andrey Gorin</i>                                                                                                                      |     |
| <b>A Novel Protein Secondary Structure Prediction System Based on Compound Pyramid Model</b>                                                                                             | 229 |
| <i>Bingru Yang</i>                                                                                                                                                                       |     |
| <b>Protein Model Assessment via Improved Fuzzy Decision Tree</b>                                                                                                                         | 238 |
| <i>Anjum Reyaz-Ahmed, Nael Abu-halaweh, Robert Harrison, Yan-Qing Zhang</i>                                                                                                              |     |
| <b>Free Energy Decomposition of the Helix to Coil Transition</b>                                                                                                                         | 242 |
| <i>Gregory Wood, Drew Clinkenbeard</i>                                                                                                                                                   |     |
| <b>Sensitivity of a Phylogeny of the Triassic Avian-Line Radiation to Character-Transition Ordering</b>                                                                                  | 248 |
| <i>Jack Horner</i>                                                                                                                                                                       |     |
| <br><b>SESSION: COMPARATIVE SEQUENCE, GENOME ANALYSIS, GENOME ASSEMBLY, AND GENOME SCALE COMPUTATIONAL METHODS</b>                                                                       |     |
| <b>Bayesian Approach for Identifying Short Adjacent Repeats in Multiple Sequences</b>                                                                                                    | 255 |
| <i>Qiwei Li, Tong Liang, Shuo-Yen Robert Li, Xiaodan Fan</i>                                                                                                                             |     |
| <b>Non-Conservative Pairwise Statistical Significance of Local Sequence Alignment Using Position-Specific Substitution Matrices</b>                                                      | 262 |
| <i>Ankit Agrawal, Alok Choudhary, Xiaoqiu Huang</i>                                                                                                                                      |     |
| <b>Predicting Functional Sites in Biological Sequences Using Canonical Correlation Analysis</b>                                                                                          | 269 |
| <i>Alvaro Gonzalez, Li Liao, Cathy Wu</i>                                                                                                                                                |     |
| <b>Collecting Statistical Information in DNA Sequences for the Detection of Special Motifs</b>                                                                                           | 274 |
| <i>Lars Wienbrandt, Manfred Schimmler</i>                                                                                                                                                |     |
| <b>A Combinative Strategy for Higher Reliable Tag SNPs Selection</b>                                                                                                                     | 279 |
| <i>Tai-Chun Wang, Javid Taheri, Albert Zomaya</i>                                                                                                                                        |     |
| <b>Alignment of Sequences Using a Genetic Algorithm and Dynamic Programming</b>                                                                                                          | 286 |
| <i>Vianney Morales Zamora, Jose Crispin Hernandez Hernandez, Jose Federico Ramirez Cruz</i>                                                                                              |     |
| <b>Time Frequency Analysis of Mitochondrial Genome</b>                                                                                                                                   | 293 |
| <i>Eric Linton, Paul Albee, Patrick Kinnicutt, En-Bing Lin</i>                                                                                                                           |     |
| <b>Translating Gene Signatures Across Tissues: A Statistical View</b>                                                                                                                    | 298 |
| <i>Adetayo Kasim, Ziv Shkedy, Dan Lin, Suzy Van Sanden, Jose Cortinas Abrahantes, Hinrich Goehlmann, Luc Bijnens, Dani Yekutieli, Michael Camilleri, Jeroen Aerssens, Willem Talloen</i> |     |

|                                                                               |            |
|-------------------------------------------------------------------------------|------------|
| <b>Using the Genetic Code Wisdom for Recognizing Protein Coding Sequences</b> | <b>302</b> |
| <i>Paweł Błażej, Paweł Mackiewicz, Stanisław Cebrat</i>                       |            |

|                                                                           |            |
|---------------------------------------------------------------------------|------------|
| <b>Investigation of the Lineage and Tissue Specificity of Genes</b>       | <b>306</b> |
| <i>Yizhen Jia, Thomas Wong, You-Qiang Song, David Smith, Siu-Ming Yiu</i> |            |

|                                                                                                     |            |
|-----------------------------------------------------------------------------------------------------|------------|
| <b>Identifying Highly Conserved Blocks in Families of Biosequences Through Selective Extensions</b> | <b>311</b> |
| <i>Jaime Seguel, Yaisiel Torres</i>                                                                 |            |

|                                                                                                    |            |
|----------------------------------------------------------------------------------------------------|------------|
| <b>Asymptotic Analysis of SIMD Optimized DFT based EXON Prediction Algorithm for DNA Sequences</b> | <b>315</b> |
| <i>Syed Shams-ul-haq</i>                                                                           |            |

## **SESSION: DRUG TARGETS, IMMUNOTHERAPY, AND COMPUTATIONAL METHODS FOR SYSTEM AND MICRO BIOLOGY**

|                                                                                                     |            |
|-----------------------------------------------------------------------------------------------------|------------|
| <b>Identifying CRC Specific Pathways and Drug Targets from Literature Augmented Proteomics Data</b> | <b>323</b> |
| <i>Meeta Pradhan, Mathew Palakal</i>                                                                |            |

|                                                                               |            |
|-------------------------------------------------------------------------------|------------|
| <b>Tumor Liberated Protein from Cancer and Perspectives for Immunotherapy</b> | <b>330</b> |
| <i>Giulio Tarro</i>                                                           |            |

|                                                                                                 |            |
|-------------------------------------------------------------------------------------------------|------------|
| <b>Phylogenetic Analysis of H1N1 2009 Influenza Virus</b>                                       | <b>334</b> |
| <i>Ameer Shaik Abdul, Aparna Sriram, Sri Harsha Muppaneni, Teja Polapragada, Zhong-Hui Duan</i> |            |

|                                                             |            |
|-------------------------------------------------------------|------------|
| <b>Co-Evolution of the Influenza Virus and Its Hosts</b>    | <b>339</b> |
| <i>Stephen Huff, Mark Rojas, Paul Havlak, Yuriy Fofanov</i> |            |

|                                                                                                 |            |
|-------------------------------------------------------------------------------------------------|------------|
| <b>An Estimate of the Mutation Rates of the Active Sites of Influenza A/H5N1 Neuraminidases</b> | <b>344</b> |
| <i>Jack Horner</i>                                                                              |            |

|                                                                                             |            |
|---------------------------------------------------------------------------------------------|------------|
| <b>A Bayesian Phylogenetic Analysis of Influenza A/H1N1 Neuraminidase-Encoding Segments</b> | <b>350</b> |
| <i>Jack Horner</i>                                                                          |            |

|                                                                                                |            |
|------------------------------------------------------------------------------------------------|------------|
| <b>Molecular Probes for the Detection of Cyanophage AS-1 and its Cyanobacterial Hosts</b>      | <b>356</b> |
| <i>Tin-Chun Chu, Jonathan Jimenez, Lauren Strawn, Michelle Reed, Lauren Pohren, Lee H. Lee</i> |            |

|                                                                                                                      |            |
|----------------------------------------------------------------------------------------------------------------------|------------|
| <b>Promoter Prediction in <i>Halothiobacillus Neapolitanus</i> c2 Based on Stress-induced Duplex Destabilization</b> | <b>363</b> |
| <i>Aleksandra Markovets, Abigail Newsome, Charles Bland</i>                                                          |            |

**SESSION: COMPUTATIONAL METHODS FOR FILTERING, NOISE  
 CANCELLATION, AND SIGNAL AND IMAGE PROCESSING**

|                                                                            |            |
|----------------------------------------------------------------------------|------------|
| <b>A Fast Noise Reduction Driven Distance-Based Phylogenetic Algorithm</b> | <b>375</b> |
| <i>Francesca Tria, Emanuele Caglioti, Vittorio Loreto, Simone Pompei</i>   |            |

|                                                                |            |
|----------------------------------------------------------------|------------|
| <b>Detection and Characterization of Vesicles in EM Images</b> | <b>381</b> |
| <i>Gilles Hermann, Hubert Kihl, Jean-Philippe Urban</i>        |            |

|                                                                                               |            |
|-----------------------------------------------------------------------------------------------|------------|
| <b>A Hierarchical Decision Engine for Computer Aided Lung Nodule Detection from CT Images</b> | <b>387</b> |
| <i>Omer Soysal, Jianhua Chen, Steven Bujenovic, Helmut Schneider</i>                          |            |

|                                                                            |            |
|----------------------------------------------------------------------------|------------|
| <b>Re-alignment of Class Images in Single-particle Electron Microscopy</b> | <b>394</b> |
| <i>Wooram Park, Gregory Chirikjian</i>                                     |            |

|                                                                                                |            |
|------------------------------------------------------------------------------------------------|------------|
| <b>Automated Medical Image Fusion: A Comparative Study Between GA and PSO Based Approaches</b> | <b>398</b> |
| <i>Mahua, Bhattacharya, Arpita Das</i>                                                         |            |

|                                                                                                                   |            |
|-------------------------------------------------------------------------------------------------------------------|------------|
| <b>Doppler Ultrasound Signal Spectral Response in the Measurement of Blood Flow Turbulence Caused by Stenosis</b> | <b>404</b> |
| <i>Julio Solano, Monica Vazquez, Ernesto Rubio, Israel Sanchez, Martin Fuentes, Fabian Garcia-Nocetti</i>         |            |

|                                                                                                                                 |            |
|---------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>Use of a Sequential Forward Floating Search Method in Selecting fMRI and EEG Features for Classification of Visual Tasks</b> | <b>409</b> |
| <i>Bian Li, Mary Baker, Kwaku Akrofi, Allison McMahon</i>                                                                       |            |

|                                                                                   |            |
|-----------------------------------------------------------------------------------|------------|
| <b>Differentiation of Glioblastomas and Metastases using 1H-MRS spectral data</b> | <b>414</b> |
| <i>Fernando Gonzalez, Lluís Belanche</i>                                          |            |

**SESSION: MODELLING, SIMULATION AND OPTIMIZATION OF  
 BIOLOGICAL SYSTEMS**

|                                                                                                           |            |
|-----------------------------------------------------------------------------------------------------------|------------|
| <b>Strategic Planning Of Identification Technologies In Healthcare Processes: A Model And A Real Case</b> | <b>421</b> |
| <i>Paolo Locatelli, Nicola Restifo, Roberta Facchini, Elena Sini, Michele Torresani</i>                   |            |

|                                                                             |            |
|-----------------------------------------------------------------------------|------------|
| <b>Mathematical Modeling and Simulation of Latency Phase HIV-1 Dynamics</b> | <b>428</b> |
| <i>Frank Nani, Mingxian Jin</i>                                             |            |

|                                                                                                                                                       |            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>A Pathway Based Model of Retinoid Dependent Growth Arrest and Differentiation</b>                                                                  | <b>435</b> |
| <i>Shobha Gupta, T.K. Basak, S.K. Chaudhary</i>                                                                                                       |            |
| <b>Global Optimization of Molecular Potential Energy Function Using a Real Coded Genetic Algorithm</b>                                                | <b>442</b> |
| <i>Shashi Barak, Kusum Deep, Krishan Pratap Singh, Vinod Kumar Katiyar</i>                                                                            |            |
| <b>A Model Reduction Technique for Stochastic Biochemical Kinetics</b>                                                                                | <b>448</b> |
| <i>Silvana Ilie, Ekaterina Kudashkina</i>                                                                                                             |            |
| <b>Modeling and Analyzing CHIP Medical System Using Colored Petri-Nets</b>                                                                            | <b>454</b> |
| <i>Seyed Morteza Babamir, Mojdeh Rahmadian</i>                                                                                                        |            |
| <b>Reconstruction of MHC Alleles by Cross Modeling and Structural Assessment</b>                                                                      | <b>459</b> |
| <i>Cassiana Chassot Fulber, Dinler Amaral Antunes, Mauricio Menegatti Rigo, Jose Artur Bogo Chies, Marialva Sinigaglia, Gustavo Fioravanti Vieira</i> |            |
| <b>Design and Simulation of Optimal Control Systems Applied to COPD Patients</b>                                                                      | <b>464</b> |
| <i>Jaime Rojas Sanchez, Jonathan Chaparro Sanchez, Jose Soriano</i>                                                                                   |            |
| <b>Computer Simulation for the Development of Immune Cells</b>                                                                                        | <b>470</b> |
| <i>Zizhong Wang, Huiqing Yang</i>                                                                                                                     |            |
| <b>A New Attempt to Stimulus Related Data Analysis by Structured Neural Networks</b>                                                                  | <b>476</b> |
| <i>Bernd Bruckner, Tobias Walter</i>                                                                                                                  |            |
| <br><b>SESSION: COMPUTATIONAL METHODS, COMPUTER-ASSISTED MEDICAL CARE AND SERVICE SYSTEMS, AND DIAGNOSTIC TOOLS IN BIOMEDICAL</b>                     |            |
| <b>Seizure Detection Using Sequential and Coincident Power Spectra with Deterministic Finite Automata</b>                                             | <b>481</b> |
| <i>Rory A. Lewis, Andrew M. White</i>                                                                                                                 |            |
| <b>A Tool to Aid in the Diagnosis of Bipolar Disorder</b>                                                                                             | <b>489</b> |
| <i>Luciano Comin Nunes, Placido Rogerio Pinheiro, Tarcisio Cavalcante Pequeno, Mirian Caliope Dantas Pinheiro</i>                                     |            |
| <b>A Tool to Aid in the Neuropsychological Diagnosis of Alzheimer's Disease</b>                                                                       | <b>495</b> |
| <i>Ana Karoline Araujo de Castro, Plácido Rogerio Pinheiro, Mirian Caliope Dantas Pinheiro</i>                                                        |            |
| <b>Automatic Computation for Pressure Controlled Intermittent Coronary Sinus Occlusion</b>                                                            | <b>502</b> |
| <i>Loay Alzubaidi, Werner Mohl, Frank Rattay</i>                                                                                                      |            |

|                                                                                                                                                                                                                                                                                              |            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>Computer-assisted Analysis of Fetal Hydrocephalus</b><br><i>Aliaa Youssif</i>                                                                                                                                                                                                             | <b>507</b> |
| <b>Using Kernel-PCA Features for EEG Spike Sorting</b><br><i>Muneem Shahriar, Mary Baker</i>                                                                                                                                                                                                 | <b>514</b> |
| <b>Nested Ensemble Technique for Excellence Real Time Cardiac Health Monitoring</b><br><i>Mohamed Ezzeldin A. Bashir, Makki Akasha, Dong Gyu Lee, Gyeong Min Yi, Keun Ho Ryu, Eun-jong Cha, Jang-whan Bae, Myeong Chan Cho, Chae Woo Yoo</i>                                                 | <b>519</b> |
| <b>Analysis of Verbal Decision Analysis Methods Considering a Multicriteria Model to the Diagnosis of Alzheimer's Disease</b><br><i>Isabelle Tamanini, Placido Pinheiro, Mirian Pinheiro</i>                                                                                                 | <b>526</b> |
| <b>Computational Determination of Aqueous Concentrations of Inhalational Anesthetics</b><br><i>Christopher Theisen, Norbert Seidler</i>                                                                                                                                                      | <b>532</b> |
| <b>Towards A Real-Time Mobile Health Care Monitoring Embedded System</b><br><i>Alessandro Brawerman, Mauricio Perretto, Edson Sieczka , Fabio Hoffmann</i>                                                                                                                                   | <b>537</b> |
| <b>A Holistic, Interactive and Persuasive Model to Facilitate Self-care of Patients with Diabetes in Latin America and the Caribbean</b><br><i>Miguel Vargas-Iombardo, Armando Jipsion, Rafael Vejarano, Ismael Camargo, Humberto Alvarez, Elena Villalba Mora, Ernestina Menasalva Ruiz</i> | <b>544</b> |
| <b>Multistage SVM as a Clinical Decision Making Tool for Predicting Post Operative Patient Status</b><br><i>Melissa Stockman, Mariette Awad</i>                                                                                                                                              | <b>549</b> |
| <b>Electrical Activity of Human Brain - An Early Marker for Alzheimer s Disease</b><br><i>V. K. Sudha, N. Ashok Kumar, R. Sudhakar</i>                                                                                                                                                       | <b>553</b> |
| <b>A Tumor Diagnoses Assistant System in Traditional Chinese Medicine(TCM) Combining With Modern Medicine</b><br><i>Guohong Zhou, Shuqian Luo</i>                                                                                                                                            | <b>557</b> |
| <b>Web 2.0 and Healthcare Collaborative Framework for Health Awareness and Education</b><br><i>Dinesh Kumar Saini, Sanad Al-Maskari, Wail Omar</i>                                                                                                                                           | <b>561</b> |
| <b>A Real-time QRS Detection System Based on Neural Network</b><br><i>Weimin Yu, Bo Ning, Yunfeng Zhang, Jianye Zhao</i>                                                                                                                                                                     | <b>565</b> |

**SESSION: SOFTWARE PACKAGES AND OTHER COMPUTATIONAL TOPICS  
INCLUDING IN BIOINFORMATICS**

|                                                                                                                                                                                                  |     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>Efficient Pairwise Statistical Significance Estimation using FPGAs</b>                                                                                                                        | 571 |
| <i>Daniel Honbo, Ankit Agrawal, Alok Choudhary</i>                                                                                                                                               |     |
| <b>Electrical Properties Of Hydrogels From Non-Equilibrium Molecular Dynamics</b>                                                                                                                | 578 |
| <i>Joe Feldkamp</i>                                                                                                                                                                              |     |
| <b>On Complexity of Transforming Strings</b>                                                                                                                                                     | 584 |
| <i>Bhadrachalam Chitturi</i>                                                                                                                                                                     |     |
| <b>Prefix Reversals on Strings</b>                                                                                                                                                               | 591 |
| <i>Bhadrachalam Chitturi, Hal Sudborough</i>                                                                                                                                                     |     |
| <b>A Danger Theory Model</b>                                                                                                                                                                     | 599 |
| <i>Suhair Amer, John Hamilton</i>                                                                                                                                                                |     |
| <b>Automatic Cell Identification Using a Multiple Marked Point Process</b>                                                                                                                       | 605 |
| <i>Hiroshi Hatsuda</i>                                                                                                                                                                           |     |
| <b>BFAT: Bovine Spongiform Encephalopathy (BSE) Forensic Analysis Tool</b>                                                                                                                       | 610 |
| <i>Jack Horner</i>                                                                                                                                                                               |     |
| <b>Extended Secure Architecture of HIS: HL7</b>                                                                                                                                                  | 617 |
| <i>Dinesh Kumar Saini, Osama A. Rahmeh, Hemraj Saini</i>                                                                                                                                         |     |
| <b>qtpaintgui() - An integration of Command Line and Graphical User Interface</b>                                                                                                                | 624 |
| <i>Marie Vendettuoli, Dianne Cook, Heike Hofmann</i>                                                                                                                                             |     |
| <b>The Statistically Meaningful Display of Analog Data</b>                                                                                                                                       | 630 |
| <i>Robert Warner</i>                                                                                                                                                                             |     |
| <b>Computer Aided Designing of Juvenile Hormone Analogues as a Potential Pesticide Based on Ligand - Receptor Interaction - A Docking Study</b>                                                  | 634 |
| <i>Pamita Awasthi, Priyanka Sharma</i>                                                                                                                                                           |     |
| <b>A Scale-Free-Network Analog of the Canonical Potential-Energy Distribution</b>                                                                                                                | 640 |
| <i>Jack Horner</i>                                                                                                                                                                               |     |
| <b>Global Stability for the n-Species Lotka-Volterra Tree Systems</b>                                                                                                                            | 644 |
| <i>Xinhua Ji</i>                                                                                                                                                                                 |     |
| <b>Bhageerath: A Web Enabled High Performance Computing (HPC) Software Suite for Predicting The Tertiary Structures of Small Globular Proteins Using all Atom Energy Based Ab initio Methods</b> | 651 |
| <i>Shashank Shekhar, Priyanka Dhingra, Bharat Lakhani, Avinash Mishra, B. Jayaram</i>                                                                                                            |     |

|                                                                                                                          |            |
|--------------------------------------------------------------------------------------------------------------------------|------------|
| <b>Biopsy Back Wave Preprocessing Research of BRATUMASS System based on Applications of Fractional Fourier Transform</b> | <b>658</b> |
|--------------------------------------------------------------------------------------------------------------------------|------------|

*Zhi-fu Tao, Xia-chen Dong, Meng Yao, Yi-zhou Yao*

|                              |            |
|------------------------------|------------|
| <b>To Live and Die in CA</b> | <b>662</b> |
|------------------------------|------------|

*Keith Schubert, Ernesto Gomez, Jane Curnutt, Penelope Boston*

|                                                                                                                           |            |
|---------------------------------------------------------------------------------------------------------------------------|------------|
| <b>From Celestial to Terrestrial: A New Light on David Kinnebrook's Systematic Error of Judgment at Greenwich in 1796</b> | <b>666</b> |
|---------------------------------------------------------------------------------------------------------------------------|------------|

*Iraj Derakhshan*

### **SESSION: ALGEBRAIC BIOLOGY AND BIOINFORMATICS, ABB**

|                                                                                         |            |
|-----------------------------------------------------------------------------------------|------------|
| <b>Incorporating Gene Ontology in Clustering Time-Course Gene-Expression Array Data</b> | <b>671</b> |
|-----------------------------------------------------------------------------------------|------------|

*Jason Gershman*

|                                                                    |            |
|--------------------------------------------------------------------|------------|
| <b>Matrix Genetics and THE Bipolar Algebra of the Genetic Code</b> | <b>678</b> |
|--------------------------------------------------------------------|------------|

*Matthew He, Sergei Petoukhov*

### **SESSION: NOVEL ALGORITHMS FOR IN-SILICO MODELING BIOLOGICAL NETWORKS AND GENERATING QUANTITATIVE PREDICTIONS**

|                                                                                    |            |
|------------------------------------------------------------------------------------|------------|
| <b>Comparing Robust Methods for Defining Directed Networks and Their Hub Nodes</b> | <b>687</b> |
|------------------------------------------------------------------------------------|------------|

*Peter Langfelder, Tova Fuller, Steve Horvath*

|                                                                                                      |            |
|------------------------------------------------------------------------------------------------------|------------|
| <b>Identification of Gene Pathway Involved in Clinical Traits Using Bayesian Network Classifiers</b> | <b>693</b> |
|------------------------------------------------------------------------------------------------------|------------|

*Jiangeng Li, Yi Zhu, Xiaogang Ruan*

|                                                                                    |            |
|------------------------------------------------------------------------------------|------------|
| <b>Information-Theoretic Inference of Gene Networks Using Backward Elimination</b> | <b>700</b> |
|------------------------------------------------------------------------------------|------------|

*Patrick Meyer, Daniel Marbach, Sushmita Roy, Manolis Kellis*

|                                                                   |            |
|-------------------------------------------------------------------|------------|
| <b>Pathway-based Microarray Data Analysis for Cancer Research</b> | <b>706</b> |
|-------------------------------------------------------------------|------------|

*Fei-Hung Hung, Hung-Wen Chiu*

|                                                                        |            |
|------------------------------------------------------------------------|------------|
| <b>Latent Variables in Bayesian Network Construction and Inference</b> | <b>712</b> |
|------------------------------------------------------------------------|------------|

*Jun Zhu, Manikandan Narayanan, Bin Zhang, Kai Wang*

|                                                                                                            |            |
|------------------------------------------------------------------------------------------------------------|------------|
| <b>A Study of Genomic Modules and Intermodular Networks for Understanding the Operating System of Life</b> | <b>717</b> |
|------------------------------------------------------------------------------------------------------------|------------|

*Hye Young Kim, Jin Hyuk Kim*

|                                                                                                                                                                                                       |            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>A Novel Knowledge-driven Systems Biology Approach for Phenotype Prediction Upon Genetic Intervention</b>                                                                                           | <b>724</b> |
| <i>Rui Chang, Wei Wang</i>                                                                                                                                                                            |            |
| <b>Network Inference by Considering Multiple Objectives: Insights from In Vivo Transcriptomic Data Generated by a Synthetic Network</b>                                                               | <b>734</b> |
| <i>Sandro Lambeck, Andreas Dräger, Reinhard Guthke</i>                                                                                                                                                |            |
| <br><b>SESSION: BIOLOGICAL NETWORKS, FEATURE EXTRACTION, GENE EXPRESSIONS, HIV, SOFTWARE TOOLS, MODELING, MOTIFS, PROTEOMICS, DNA, DATA ANALYSIS, MEDICINE, BCI/EEG, RNA, AND PATTERN RECOGNITION</b> |            |
| <b>Reconstruction of Biological Networks Structure by Using Bayesian Network Models with a Two-step Learning Procedure</b>                                                                            | <b>743</b> |
| <i>Baikang Pei, Dong-Guk Shin</i>                                                                                                                                                                     |            |
| <b>Directional Equilibrium of Gene Regulatory Networks in Developmental Biology</b>                                                                                                                   | <b>750</b> |
| <i>Martin Ehler, Brian P. Brooks, Robert F. Bonner</i>                                                                                                                                                |            |
| <b>Robust Stability Analysis and Design Under Consideration of Multiple Feedback Loops in the Tryptophan Regulatory Network of E. coli</b>                                                            | <b>755</b> |
| <i>Anke Meyer-Baese, Fabian Theis</i>                                                                                                                                                                 |            |
| <b>Identification of Specific Gene Expression Signatures in Oncology</b>                                                                                                                              | <b>760</b> |
| <i>Gregor Stiglic, Igor Pernek, Peter Kokol</i>                                                                                                                                                       |            |
| <b>Proper Alignment of MS/MS Spectra from Unsequenced Species</b>                                                                                                                                     | <b>766</b> |
| <i>Freddy Cliquet, Guillaume Fertin, Irena Rusu, Dominique Tessier</i>                                                                                                                                |            |
| <b>Non Destructive Sensing of Food Materials using Fuzzy c-means Clustering</b>                                                                                                                       | <b>773</b> |
| <i>Gugulethu Mabuza, Tarik AL-Ani, Karim Djouani, Johnson Agbinya</i>                                                                                                                                 |            |
| <b>Interval-Censoring in Biomedical and Biopharmaceutical Clinical Trials</b>                                                                                                                         | <b>779</b> |
| <i>Ding-Geng Chen, Karl Peace, Lili Yu, Yuhlong Lio, Yibin Wang</i>                                                                                                                                   |            |
| <b>A Tool Preference Selection Method for RNA Secondary Structure Prediction with SVM</b>                                                                                                             | <b>785</b> |
| <i>Chiou-Yi Hor, Chang-Biau Yang, Chiou-Ting Tseng, Hung-Hsin Chen</i>                                                                                                                                |            |
| <b>Cell Assay Image Classification with Few Labeled Examples</b>                                                                                                                                      | <b>792</b> |
| <i>Nicolas Cebron</i>                                                                                                                                                                                 |            |

|                                                                                                                                                                        |     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| <b>SA-Motifbase: A Database of Protein Structural Alphabet Motifs</b>                                                                                                  | 796 |
| <i>Shih-Yen Ku, Yuh-Jyh Hu</i>                                                                                                                                         |     |
| <b>IT Services for Decision Support Systems on Public Health Problems by using Genomic Data</b>                                                                        | 801 |
| <i>Juan Carlos Cuevas-Tello, Christian Alberto Garcia-Sepulveda, Hector G. Perez-Gonzalez, Manuel Mora</i>                                                             |     |
| <b>Three Dimensional Structure Modeling and Analysis of Ribulose 1,5-Bisphosphate Carboxylase of Hypericum Perforatum</b>                                              | 807 |
| <i>Ashish Gupta, Anshika Malaviya, Sharada M Potukuchi, Jitendra Narayan</i>                                                                                           |     |
| <b>Spatially Indexing Sequences using Hashes</b>                                                                                                                       | 811 |
| <i>Mike Eagar, Mark Clement, Quinn Snell</i>                                                                                                                           |     |
| <b>Analysis of Hydrogenase Maturation Protease from Pyrococcus abyssi Through Homology Modeling</b>                                                                    | 815 |
| <i>Lakshmi Bhavani Nelavelli</i>                                                                                                                                       |     |
| <b>MicroLabs for Human Sperm</b>                                                                                                                                       | 822 |
| <i>Giuseppe Tritto, Xianghong Ma, Mark price</i>                                                                                                                       |     |
| <b>Parallel Hybrid Genetic Algorithm based Dynamic Load-Balancing for Mining of Molecular Fragments</b>                                                                | 827 |
| <i>Salahuddin Mohammad Masum, Mohammed Yeasin</i>                                                                                                                      |     |
| <b>Graph Cut Based Active Contours and Statistical Shape Priors</b>                                                                                                    | 834 |
| <i>Foued Derraz, Antonio Pinti, Abdelmalik Taleb-Ahmed, Laurent Peyrodie, Gérard Forzy, Azzeddine Chikh</i>                                                            |     |
| <b>A Case Tool for Prediction of Squamous Cancerous and Non-Cancerous Cells using DIP and ANN</b>                                                                      | 841 |
| <i>Nitin Chanderwal, Pradeep Kumar Naik, Anitya Nijhara, Shantanu Agarwal, Ayush Agarwal, Shweta Malik, Ujjawal Khandelwal</i>                                         |     |
| <b>Application of W-curves and TSP to Clustering HIV-1 Sequences by Epitope</b>                                                                                        | 847 |
| <i>Douglas Cork, Steven Lembark, Sodsai Tovanabutra, Eric Sanders-Buell, Bruce Brown, Merlyn Robb, Lindsay Wieczorek, Victoria Polonis, Nelson Michael, Jerome Kim</i> |     |
| <b>Robust Stability Analysis of Multi-Time Scale Genetic Regulatory Networks under Parametric Uncertainties</b>                                                        | 854 |
| <i>Anke Meyer-Baese, Claudia Plant, Susanne Cappendijk, Fabian Theis</i>                                                                                               |     |
| <b>Communication Technologies Based on Brain Activity</b>                                                                                                              | 864 |
| <i>Avid Roman Gonzalez</i>                                                                                                                                             |     |

|                                                                                                                    |     |
|--------------------------------------------------------------------------------------------------------------------|-----|
| <b>The Impact of Equally-Optimal Pairwise Alignments</b>                                                           | 870 |
| <i>Lukas Olson, Mark Clement, Quinn Snell</i>                                                                      |     |
| <b>Infrared Tracking for Locomotion and Devices Control in Quadriplegic People</b>                                 | 873 |
| <i>Mauricio Plaza Torres</i>                                                                                       |     |
| <b>Engineering Information Technology for Health in Emergency Management</b>                                       | 877 |
| <i>Marcella Coccanari</i>                                                                                          |     |
| <b>The Beta Adrenergic Receptor: A Case Study in Modeling a G Protein Coupled Receptor in a Cell Biology Class</b> | 882 |
| <i>Margaret Goodman</i>                                                                                            |     |