

2015 IEEE 5th International Conference on Computational Advances in Bio and Medical Sciences (ICCABS 2015)

**Miami, Florida, USA
15 – 17 October 2015**



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ICCABS 2015 Program

Thursday, October 15, 2015

8:50am -
9:00am **Opening Remarks**

9:00am- **Keynote Talk**
10:00am **Chair:** *Sanguthevar Rajasekaran*

Srinivas Aluru (Georgia Institute of Technology)
Title: [Approximate Sequence Matching: Algorithms and Applications](#)

10:00am -
10:30am **Coffee break**

10:30am -
12:30pm **Parallel Sessions**

Session 1A: ICCABS 1
Chair: *Max Alexeyev*

- *Trevor Cickovski, Eli Peake, Vanessa Aguiar-Pulido and Giri Narasimhan.* [ATria: A Novel Centrality Algorithm Applied to Biological Networks](#) 1
- *Amirhossein Jabalameli and Aman Behal.* [A Constrained Linear Approach to Identify a Multi-timescale Adaptive Threshold Neuronal Model](#) 2
- *Ekaterina Nenasteyeva, Yuriy Ionov, Ion Mandoiu and Alex Zelikovsky.* [Identification of Cancer-Specific Motifs in Mimotope Profiles of Serum Antibody Repertoire](#) 8
- *Cintia Palu, Leandra Linhares-Lacerda, Marcelo Ribeiro-Alves and Wilson Savino.* [Genetic Modulation During Thymocyte Development: an Integrative Approach Based on Microarray Meta-analysis](#) 9

Session 1B: ICCABS 2
Chair: *Rahul Singh*

- *Chunchun Zhao and Sartaj Sahni.* [Cache and Energy Efficient Alignment of Very Long Sequences](#) 67
- *Da Zhang, Hao Wang, Kaixi Hou, Jing Zhang and Wu-Chun Feng.* [pDindel: Accelerating InDel Detection on Modern Multi-Core SIMD CPU Architecture](#) 73
- *Shailesh Appukuttan, Rohan Sathe and Rohit Manchanda.* [Modular Approach to Modeling Homotypic and Heterotypic Gap Junctions](#) 79
- *Zhichao Lian, Xiang Li, Yi Pan, Xuan Guo, Le Chen, Guantao Chen, Zhihui Wei, Tianming Liu and Jing Zhang.* [Dynamic Bayesian Brain Network Partition and Connectivity Change Point Detection](#) 85

12:30pm -
02:00pm **Lunch**

2:00pm - **Invited Talk**
2:50pm **Chair:** *Alex Zelikovsky*

Giri Narisimhan (Florida International University)
Title: [Microbiome Analysis: Past, Present and Future](#)

2:50pm -
3:30pm **Coffee break**

3:30pm -
5:30pm **Parallel Sessions**

Session 2A: ICCABS 3
Chair: *James Lara*

- *Inna Rytsareva, David S Campo, Yueli Zheng, Seth Sims, Cansu Tetik, Jain Chirag, Sriram Chockalingam, Sharma Thankachan, Amanda Sue, Srinivas Aluru and Yury Khudyakov.* [Efficient Detection of Viral Transmission with Threshold-based Methods](#) 15
- *Pavel Skums, Olga Glebova, David Campo, Nana Li, Zoya Dimitrova, Seth Sims, Leonid Bunimovich, Alex Zelikovsky and Yury Khudyakov.* [Algorithms for Prediction of Viral Transmissions Using Analysis of Intra-Host Viral Populations](#) 21
- *Alexander Artyomenko, Nicholas Wu, Sergei Mangul, Eleazar Eskin, Ren Sun and Alex Zelikovsky.* [2SNV: Quasispecies Reconstruction from PacBio Reads](#) 22
- *James Lara, Livia Rossi, Gilberto Vaughan and Yury Khudyakov.* [Predicting the Cross-immunoreactivity of Hepatitis C Virus Hypervariable Region 1 Peptides using Polynomial Neural Networks](#) 23

Session 2B: ICCABS 4
Chair: *Giri Narisimhan*

- *Faraz Hussain, Zubir Husein, Neslisah Torosdagli, Narsingh Deo, Sumanta Pattanaik, Chung-Che Jeff Chang and Sumit Kumar Jha.* [SANJAY: Automatically Synthesizing Visualizations of Flow Cytometry Data Using Decision Procedures](#) 91
- *Bogdan Armaselu, Harish Arunachalam, Ovidiu Daescu, John-Paul Bach, Kevin Cederberg, Dinesh Rakheja, Anita Sengupta, Stephen Shapek and Patrick Leavey.* [Whole Slide Images Stitching for Osteosarcoma Detection](#) 92
- *Sanguthevar Rajasekaran.* [Efficient Techniques for k-mer Counting](#) 97

Friday, October 16, 2015

9:00am-
9:50am **Invited Talk**
Chair: Ion Mandoiu

Sheida Nabavi (University of Connecticut)
Title: Machine Learning for Identifying Candidate Biomarkers of Resistant to Anti-Cancer Drugs

9:50am -
10:30am **Coffee break**

10:30am -
12:30pm **Parallel Sessions**

Session 3A: ICCABS 5
Chair: Sheida Nabavi

- *Sharma V. Thankachan, Sriram Chockalingam, Yongchao Liu, Ambujam Krishnan and Srinivas Aluru.* [A Greedy Alignment-free Distance Estimator for Phylogenetic Inference](#) 24
- *Michael Coulombe, Kristian Stevens and Dan Gusfield.* [Construction, Enumeration, and Optimization of Perfect Phylogenies on Multi-state Data.](#) 25
- *Nikita Alexeev and Max Alekseyev.* [Estimation of the True Evolutionary Distance under the Fragile Breakage Model](#) 31
- *Lauren Assour and Scott Emrich.* [Global Maximum-Parsimony Based Ancestral Reconstruction with Non-Universal Genes](#) 32

Session 3B: CANGS 1
Chair: Sing-Hoi Sze

- *Sing-Hoi Sze, Meaghan Pimsler, Jeffery Tomberlin, Corbin Jones and Aaron Tarone.* [A Scalable and Memory-Efficient Algorithm for De Novo Transcriptome Assembly of Non-Model Organisms](#) N/A
- *David Seifert, Monica Dragan and Niko Beerenwinkel.* [MinPEPco: Inferring Viral Haplotypes by Paired-end Sequencing using Minimal Path Covers](#) N/A
- *Siu Ming Yiu.* [Metagenomics Binning and Annotation: Issues and Challenges](#) N/A
- *Erin-Elizabeth Durham, Chinua Umoja and Robert Harrison.* [A Novel Approach to Determine Protein Docking Locations Using Fuzzy Shape Recognition](#) N/A

12:30pm -
2:00pm **Lunch**

2:00pm - **Keynote Talk**
3:00pm **Chair:** *Sanguthevar Rajasekaran*

S. Cenk Sahinlap (Simon Fraser University)
Title: [Algorithms for Data Driven Cancer Research](#)

3:00pm -
3:30pm **Coffee break**

3:30pm -
5:30pm **Parallel Sessions**

Session 4A: ICCABS 6
Chair: *S. Cenk Sahinlap*

- *Rahul Singh and Thomas Olson.* [Computational Prediction of ATC Codes of Drug-Like Compounds Using Tiered Learning](#) 38
- *Oyetunji Enoch Ogundijo, Dan He and Laxmi Parida.* [Performance Evaluation of Different Encoding Strategies for Quantitative Genetic Trait Prediction](#) 39
- *Hamid Ismail, Ahoi Jones, Jung Kim, Robert Newman and Dukka KC.* [Phosphorylation Site Prediction using Random Forest](#) 45
- *Ning Yu, Xuan Guo, Alexander Zelikovsky and Yi Pan.* [GaussianCpG: A Gaussian Model for Detection of Human CpG Island](#) 51

Session 4B: CANGS 2
Chair: *John Malone*

- *Sergey Aganezov and Max Alekseyev.* [Scaffold](#) N/A
[Assembly Based on the Analysis of Gene Orders and Genomic Repeats](#)
- *Tak-Wah Lam.* [A Simple and Economical Method for Improving Whole-genome Alignment](#) 98
- *Steffen Heber.* [Using PacBio Long-read Sequencing to Investigate Genes with Complex Splicing Behavior](#) N/A
- *John Malone.* [Gene Dose, Compensation, and Phenotype](#) N/A

6:00pm -
9:00pm **Banquet**

Saturday, October 17, 2015

09:00am- ICCABS Invited Talk
09:50am Chair: *Alex Zelikovsky*

Ion Mandoiu (University of Connecticut)
Title: Computational Methods for Genomics-guided Immunotherapy

10:00am -
10:30am Coffee break

10:30am -
12:30pm Parallel Sessions

Session 7A: ICCABS 7
Chair: *Ion Mandoiu*

- *Qiwen Hu, Catharina Merchante, Anna Stepanova, Jose Alonso and Steffen Heber.* [Mining Transcript Features Related to Translation in Arabidopsis Using LASSO and Random Forest](#) 52
- *Eric C.H. Chen, Annie Morin, Jean-Hugues Chauchat and David Sankoff.* [Statistical Analysis of Fractionation Resistance by Functional Category and Expression](#) 58
- *Yinjiao Ma, Lingling Zhang, Christian Geneus and Haijun Gong.* [Weighted Gene Coexpression Network Analysis of Prostate Cancer](#) 59
- *Yina Cifuentes, Sergio Latorre, Mario Velasquez and Andrés Pinzón.* [Draft Genome Sequence of a Natural Isolated *Saccharomyces Cerevisiae* from Colombia](#) 65

Session 7B: ICCABS POSTER
Chair: *Alex Zelikovsky*

- *Yuanyuan Feng, Vandana P. Janeja, Yelena Yesha, Naphtali Rishe, Michael A. Grasso and Amanda Niskar.* [Poster: Classifying Primary Outcomes in Rheumatoid Arthritis: Knowledge Discovery from Clinical Trial Metadata](#) 99
- *Igor Mandric, Yvette Temate Tiagueu, Adriano Senatore, Paul Katz and Alex Zelikovsky.* [Poster: DORFA: Database-guided ORFeome Assembly from RNA-Seq Data](#) N/A
- *Michael Robinson and Naphtali Rishe.* [Poster: Towards Finding Unknown Genes: the GenomePro Framework](#) 101
- *Maryam Hassanzadeh, Akbar Farhoodinejad and Shahrokh Yousefzadeh-Chabok.* [Poster: A Prediction Model of Traumatic Patients' Outcome by Data Mining Technique](#) 103