Chathura Gunasekara

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Education

2013 May - 2017 Spring (expected) **PhD, Computational Science & Engineering**; Michigan Technological University (Houghton, MI)

PhD Thesis title: Bioinformatics Tools and Algorithms Development for Gene Regulatory Network Inference

2006-2010 **BS, Computational Physics**; University of Colombo (Sri Lanka)

Major in Computer Science with minor in Physics and Applied Mathematics

Projects, Work Experience & Publications

Graduate Research Assistant : 2013 - Present

*Currently I am Working under **Dr. Hairong Wei** at Michigan Tech. University, conducting research to infer gene regulatory networks and indentify regulatory transcription factors (TFs) which control known biological pathways in* Arabidopsis thaliana *under stress conditions using gene expression data.*

- TF-miner is a machine learning based data analysis pipeline using Partial Least Squares and Graphical Gaussian Model to identify regulatory TFs using microarray expression under stress conditions. **[*source*]**
- Bayesian network to infer gene regulatory network for this research was at NSF Project/Bioinformatics Workshop at Noble Foundation, Ardmore, Oklahoma.**[*source*]**,**[*presentation*]**
- Pairwise analysis of Pathway - Transcription Factor gene expression data to find regulatory TF clusters.**source**
- Currently implementing a web based gene expression data analysis pipeline to identify Transcription Factor(TF) clusters which associates with known biological pathways.**source**, **web**

Completed projects

- Developed, implemented and published an algorithm and web application to search for degenerate motifs in the promoter regions of 50 plant species genomes.**[source]**, **[web]**, **[publication]**
- I configured, installed and developed Perl scripts for parsing the FASTQ files using open sourse tools for a genome browser to visualize RNA-seq and Ribo-seq of wild-type and STTM mutants.**web**
- Collaborated with a lab member to publish an algorithm to infer hierachical gene regulatory network from gene expression data.**[publication]**
- Collaborated with a lab member to develop the Poplar Gene Expression Pipeline web application. **web**, **publication**
- Contributed to the publication of a lab member by creating a Circos Visualization of genomic data.**[source]**

Software Engineer/Research Engineer : 2010 - 2013

Worked on a **collaborative research project** with University of Colombo School of Computing and Sri Lanka Navy. Following are the list of publications I authored/contributed:

- Develop algorithms and to implement using Java and web based technologies a Survailance platfrom to fuse data from multiple transponders such as AIS, RADAR sensors around Sri Lanken coast line.**[Publication]**
- Maritime Navigation Simulator Project, Low Cost 3D Immersive Telepresence for Survaillance, Planning, Maneuring : 3D-COP 10.5176/2251-1679_CGAT31. Computer Games, Multimedia & Allied Technology Conference 2012.**[Publication]**
- Maritime Navigation Simulator Project for Simulating Narrow Channel Effect on Surge Motion of a Ship in a Virtual Environment. **[Publication]**
- Undergraduate Research on Spatialized Real Time Auditory Interface for a Virtual Maritime Application in 2010.**[Publication]**

Technical Experience and Recent Course work

Technical Skills Software and Programming Languages

- Perl,Python (scikit-learn, numpy, scipy, pandas), R
- Java, C++, Database(SQL), Linux/Unix/Shell Scripting, Microsoft Excel, LaTeX
- Web Development in Linux/Apache/MySql/PHP

Data Science

Applied Predictive Modelling Fall 2014

Introduction to Data Science Fall 2014

Data Mining Spring 2014

Data mining for geo spatial applications Fall 2015

Machine Learning - Regression Coursera Verified Certification (online)

Statistics

Statistical Methods Fall 2013

Regression Analysis Spring 2013

Time series analysis and forcasting Spring 2015

Computer Science

Advanced Scripting and Programming Fall 2015

Algorithmic Toolbox Coursera Verified Certification (online)

Bioinformatics

Bioinformatics Programming Skills Fall 2013

Side projects

Maintaining a data science blog **link**