

# 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 data analysis pipeline based on partial least squares and graphical gaussian models 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 gene expression data to find regulatory TF clusters using novel association methods. [\[source\]](#)
- 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 source 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 genomics data from Birch genome. [\[source\]](#)

### 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 Surveillance platform to fuse data from multiple transponders such as AIS, RADAR sensors around Sri Lankan coast line. **[Publication]**
- Maritime Navigation Simulator Project, Low Cost 3D Immersive Telepresence for Surveillance, Planning, Maneuvering : 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 forecasting** 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 <https://cjgunase.github.io>

Learning biology from online courses