## Bhanu Kamapantula

https://bkamapantula.github.io
(864) 650-6607

**EDUCATION**

Ph.D. in Computer Science **Fall 2011 - Fall 2015** ***(expected)***
Biological networks lab, Virginia Commonwealth University

M.S. in Computer Science **Fall 2009 - Summer 2011**
Texas A&M University-Corpus Christi

**SOFTWARE**

*Programming* - Python, R, bash, JavaScript/jQuery, PHP, MySQL, basic NoSQL, SQL, C, TCL.
*Visualization* - d3js, Google visualization, nvd3, HighCharts, Tableau, Gephi, Cytoscape, NodeXL
*Analysis* - Google BigQuery, Scikit-learn, NumPy, IPython, NetworkX, BeautifulSoup, Multiprocessing, Mechanize, urllib3
*Version control* - Git

**EXPERIENCE**

*Research Assistant* **Fall 2014 - current**
*Teaching Assistant* **Fall 2011 - Fall 2014**
CMSC 302 - Intro to Operating Systems **Spring 2014**
CMSC 302 - Intro to Operating Systems **Fall 2013**
CMSC 311 - Computer Organization **Spring 2013**
CMSC 409 - Artificial Intelligence **Fall 2012**
CMSC 311 - Computer Organization **Spring 2012**
CMSC 101 - Introduction to Computer Science **Fall 2011**

**AWARDS**

*Best student paper award*, 9th International conference on Bio-inspired Information and Communications Technologies, Boston **December 2014**
*Travel award*, 9th International conference on Bio-inspired Information and Communications Technologies, Boston **December 2014**
*Dean's Early Research Initiative Mentor*
Mentoring a high-school student on a research project to determine robustness of complex networks **Fall 2014 - Spring 2015**
*Outstanding paper award*, Department of Computer Science, VCU **March 2013**
*Travel award*, IEEE International Conference on Pervasive Computing and Communications **March 2012**

**RESEARCH EXPERIENCE**

Exploring Biological Network Robustness using Bio-Inspired Wireless Sensor Networks: A Novel Paradigm for Systems Research, *a National Science Foundation project*
Graduate researcher **September 2013 - ongoing**
Improving the efficiency of Wireless Sensor Networks using principles of Genomic Robustness, *a National Science Foundation project*
Graduate researcher **August 2011 - August 2013**

Research portfolio - https://bkamapantula.github.io/research

**PROJECTS**

**Cancer Mutations Database**
I am actively leading a team of 6 students on a project to build a central resource for cancer mutations data. This project presents cancer biomarker analytics by mining a

massive cancer mutations database. This project is in collaboration with other computer science researchers, undergraduate students.

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Node.js, d3 js, SQL, Bootstrap.

**BioRobust** Fall 2014 - Fall 2015

BioRobust is an online framework to determine the robustness of biological networks using in-silico experiments and identifying significant features that contribute to the robustness. This project is in collaboration with other computer science researchers, undergraduate and high school students. *Under development. Release by end-Fall 2015*

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Python. Django. JavaScript. NS-2. scikit-learn. NetworkX. HTML. CSS.

**Network analysis** (8 publications) August 2011 - September 2015

I led our research group by in-silico modeling of biological networks to determine their strength. This involved substructure analysis, graph transformation, graph comparison. My work won the outstanding paper award in the Computer Science department at VCU. Further, I developed random forest regression models for predicting robustness of a complex biological system. This project is funded by National Science Foundation.

**Machine learning** (3 publications) August 2014 - September 2015

I determined the best network features extracted from 5000 different transcriptional regulatory networks of model organisms, E. coli and Yeast, using random forest regression modeling. My work won the best student paper at BICT 2014 conference in Boston, December 2014.

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Tcl, NS2, Python, Scikit, Pandas, NetworkX, bash, gnuparallel.

**DISMIRA - Disease-miRNA association network** August - November 2013

This work determines the association among diseases using the associated miRNAs. Maximum weighted matching approach is used to explore the bipartite network (miRNAs, diseases as nodes) interactions. This project is in collaboration with other computer scientists. URL: http://bnet.egr.vcu.edu:8080/dismira

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JavaScript/jQuery. Bootstrap. d3js. PHP. HTML. CSS. MySQL. NetworkX.

**miRegulome** August 2013 - August 2015

miRegulome is an online repository for regulatory modules related to miRNAs. It is a unique miRNA repository with relationships to disease causing chemicals, affected genes, functions, and pathways presented in an interactive way. This project is in collaboration with computational biologists, biologists and computer scientists. URL: http://bnet.egr.vcu.edu/miRegulome

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JavaScript. Google visualization. PHP. HTML. CSS. MySQL.

**Pannotator** February 2012 - December 2012

Pannotator is an automated genome annotation tool. My role includes bridging front-end and back-end services. This project is in collaboration with computational biologists and computer scientists. URL: http://bnet.egr.vcu.edu/pannotator

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PHP, bash, HTML/CSS.

**Gender in Politics** March 2015 - ongoing

This project tracks women representation in Indian electoral politics at regional (panchayat), state legislative assembly and parliament level from 1951 to 2015. The data has been scraped, cleaned, analyzed and visualized from 300 PDF files on the Election Commission of India website (eci.nic.in). This project will be expanded to support data from all countries in the world. URL: http://genderinpolitics.org

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Python. Matplotlib. Pandas. Tableau. MySQL. WordPress.

**MAP - MPs Attending Parliament** July - October 2013

MAP tracks the attendance of Indian MPs (members of parliament) in the Lok Sabha. Data for twelve sessions between 2009-2012 has been scraped, analyzed and visualized from the Lok Sabha website (loksabha.nic.in). My interactive visualization offers views at multiple levels of granularity such as gender, political party, and state. URL: http://opinionatedindian.org/MPAttendance

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JavaScript. Bootstrap. d3js. Python. Mechanize. BeautifulSoup. HTML. CSS.

**Crime in India** March - July 2012

This project tracks all categories of crime against women in India. Data has been scraped from the National Crime Records Bureau website (ncrb.nic.in). An updated version with advanced analytics is being worked upon and is scheduled for release in Spring 2015. URL: http://crimeinindia.org/years.html

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JavaScript/jQuery. Bootstrap. Google visualization. PHP. MySQL. HTML. CSS.

## PUBLICATIONS

### Under preparation

2) A measure to determine motif centrality within transcriptional regulatory networks. **Bhanu K. Kamapantula**, Preetam Ghosh. **Short paper**.
1) Structural role of feed-forward loop motifs in transcriptional regulatory networks. **Bhanu K. Kamapantula**, Preetam Ghosh. **Journal**.

### Published - Peer-reviewed

14) Abundance of connected motifs in transcriptional networks, a case study using random forests regression. Khajamoinuddin Syed, Bhanu K. Kamapantula, Michael Mayo, Edward Perkins, Preetam Ghosh. 9th International Conference on Bioinspired Information and Communications Technologies (BICT 2015) - **Conference - Accepted**.
13) miRegulome: a knowledge-base of miRNA regulomics and analysis. Debmalya Barh, **Bhanu Kamapantula**, Neha Jain, Joseph Nalluri, Antaripa Bhattacharya, Lucky Juneja, Neha Barve, Sandeep Tiwari, Anderson Miyoshi, Vasco Azevedo, Kenneth Blum, Anil Kumar, Artur Silva, and Preetam Ghosh. Scientific Reports 5, Article number: 12832 (2015). doi:10.1038/srep12832. **Journal**.
12) Networks of interactions between feed-forward loop transcriptional motifs in gene-regulatory networks. M. Mayo, A. Abdelzaher, **B. Kamapantula**, E. Perkins, and P. Ghosh. In Proceedings of the 8th International Conference on Bioinspired Information and Communications Technologies, pp. 215-218. ICST (Institute for Computer Sciences, Social-Informatics and Telecommunications Engineering), 2014. **Conference**.
11) Dynamical impacts from structural redundancy of transcriptional motifs in gene-

regulatory networks. **B. K. Kamapantula**, M. Mayo, E. Perkins and P. Ghosh. In Proceedings of the 8th International Conference on Bioinspired Information and Communications Technologies, pp. 199-206. ICST (Institute for Computer Sciences, Social-Informatics and Telecommunications Engineering), 2014. **Conference**.

10) Feature ranking in transcriptional networks: Packet receipt as a dynamical metric. **B. Kamapantula**, M. Mayo, E. Perkins, A. Abdelzaher and P. Ghosh. In Proceedings of the 8th International Conference on Bioinspired Information and Communications Technologies, pp. 1-8. ICST (Institute for Computer Sciences, Social-Informatics and Telecommunications Engineering), 2014. **Best student paper award**. **Conference**.

9) **Bhanu Kamapantula**, Ahmed Abdelzaher, Sajal K Das, Preetam Ghosh. Quantifying robustness of biological networks using NS-2. "Modeling, Methodologies and Tools for Molecular and Nano-scale Communications" - Springer. **Book chapter - accepted**.

8) Joseph J. Nalluri, **Bhanu K. Kamapantula**, Debmalya Barh, Neha Jain, Antaripa Bhattacharya, Sintia S. de Almeida, Rommel T. Juca Ramos, Artur Silva, Vasco Azevedo, and Preetam Ghosh. "DISMIRA: Prioritization of disease candidates in miRNA-disease associations based on maximum weighted matching inference model and motif-based analysis", BMC Genomics 16, no. Suppl 5 (2015): S12. **Journal**

7) AR Santos, E Barbosa, K Fiaux, M Zurita-Turk, V Chaitankar, **B Kamapantula**, A Abdelzaher, P Ghosh, S Tiwari, N Barve, N Jain, D Barh, A Silva, A Miyoshi, V Azevedo. Pannotator: an automated tool for annotation of pan-genomes, Genet. Mol. Res 12 (2013): 2982-2989. **Journal**.

6) Joseph Nalluri, **Bhanu Kamapantula**, Preetam Ghosh, Debmalya Barh, Neha Jain, Lucky Juneja and Neha Barve. Determining miRNA-disease associations using bipartite graph modelling. ACM BCB 2013 - ACM Conference on Bioinformatics, Computational Biology and Biomedical Informatics. **Poster**.

5) **Bhanu Kamapantula**, Ahmed Abdelzaher, Preetam Ghosh, Michael Mayo, Edward Perkins, Sajal K. Das. Leveraging the Robustness of Genetic Networks: A Case Study on Bio-inspired Wireless Sensor Network Topologies, Journal of Ambient Intelligence and Humanized Computing, March 2013. **Outstanding paper award** in the *Department of Computer Science, VCU*. **Journal**.

4) Ahmed Abdelzaher, **Bhanu Kamapantula**, Preetam Ghosh and Sajal Das. Empirical Prediction of Packet Transmission Efficiency in Bio-Inspired Wireless Sensor Networks, Intelligent Systems Design and Applications (ISDA), 2012 12th International Conference on, vol., no., pp.705,710, 27-29 Nov. 2012. **Conference**.

3) Ahmed Abdelzaher, **Bhanu Kamapantula**, Preetam Ghosh and Sajal Das. A theoretical framework to quantify robustness in biological network topologies. Complex Network Dynamics: Cross-Disciplinary Tools for Modeling, Analysis, and Design. Workshop at the 14th International Conference on Distributed Computing and Networking (ICDCN), Mumbai, India, January 3-6, 2013. **Workshop**.

2) **B. Kamapantula**, A. Abdelzaher, P. Ghosh, M. Mayo, E. Perkins, S. K. Das. Performance of Wireless Sensor Topologies Inspired by E. coli Genetic Networks. In Proc. of the 8th IEEE International Workshop on Sensor Networks and Systems for Pervasive Computing (PerSeNS) in conjunction with the 2012 IEEE International Conference on Pervasive Computing and Communications, 2012. **Workshop**.

1) **Bhanu K. Kamapantula**, Ahmed M. Mahdy. Forecasting Red Tides Using a Novel Multi-Metric Adaptive Routing Algorithm in Underwater Wireless Sensor Networks, JCIS: Journal of Communications and Information Sciences, Vol. 1, No. 2, pp. 22-31, 2011. **Journal**.

**ACHIEVEMENTS & ACTIVITIES**

- 14 publications with physicists, computational biologists and computer scientists: 1 book chapter, 4 journals, 5 conferences, 2 workshops, 2 posters. 2 papers in progress. 38 citations (Google Scholar).

- My publication record also includes high impact papers in Nature Scientific Reports and BMC Genomics.
- Travel awards for conferences BICT 2014 Boston, USA and PerCom 2012 Lugano, Switzerland.
- Volunteer for incrisisrelief.org since 2013. I organized a Reddit AMA to share our groups experience with citizen-led disaster coordination. I also organize fundraisers to support victims of natural disasters.

**TALKS**

3) **Exploring Biological Robustness using Wireless Sensor Network as a Prototype**
Ph.D. dissertation proposal — Fall 2014

2) **Introduction to Data Science**
Department of Computer Science, VCU — Fall 2014

1) **Performance of Wireless Sensor Topologies Inspired by E. coli Genetic Networks**
PerSenS (PerCom) 2012, Lugano, Switzerland — Spring 2012

**ARTICLES**

2) **Women in Parliament: Where does India figure among the rest of the World?**, at https://factly.in/women-in-parliament-where-does-india-figure-among-the-rest-world/. Co-authored with Bhanupriya Rao and contributed visualizations.
7th March 2015

1) Contributed visualizations to **As Arvind Kejriwal's cabinet meets in Delhi, the one thing that makes AAP's government just like any other**, at http://scroll.in/article/707064/As-Arvind-Kejriwals-cabinet-meets-in-Delhi-the-one-thing-that-makes-AAPs-government-just-like-any-other.
16th February 2015