Prajwal Devkota

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Research Interests

Graph Theory, Network Analysis, Machine Learning, Data Mining, Data Analysis, Natural Language Processing, Knowledge Extraction, Computational Biology, Bioinformatics, Drug Discovery, Systems Biology, Network Biology, High-Performance Computing, Semantic Web Technology

Education

University of Miami, Miami, FL

Ph.D., Computer Science, *Expected:* Spring 2021

M.S., Computer Science, May 2020

Human Pathway Analysis for identification of significant proteins
Advisor: Stefan Wuchty, Ph.D.

McKendree University, Lebanon, IL

B.S., Computer Science, Mathematics, *Cum Laude* May 2008

Research Experience

Analysis of protein-protein interaction networks
Research Assistant, University of Miami Aug. 2015 - Current

- Developing methods for identification of significant proteins based on their location in the pathway and expression data using a random walker in a Protein-Protein Interaction Network. Developing algorithms to determine the proteins responsible for state change in biological systems through control theory. Applying various machine learning algorithms to predict such significant proteins for viral targets or causal genes for diseases.
  Mentor: Stefan Wuchty, Ph.D.

Analysis of Hate in Social Media
Research Assistant, University of Miami Jan. 2018 - Current

- Analysis and modeling of hate in various social media with complexity and network based analysis
  Mentor: Stefan Wuchty, Ph.D.

Regenbase
Research Assistant, University of Miami Aug. 2015 - Jan 2017

- Developing methods to extract information from Spinal Cord Injury related research publications using ontologies and text mining algorithms.
  Mentor: Ubbo Visser, Ph.D.

Correcting for Cryptic Relatedness in Genome-Wide Association Studies
Research Assistant, University of Miami Jan. 2015 - Aug. 2015

- Improving the performance of the algorithm that infers kinship coefficient from identity states without assuming known pedigree, using an expectation-maximization algorithm.
  Mentor: B. Kirkpatrick, Ph.D.

Publications

-. **Devkota, P.**, Wuchty, S., "Controllability of Regulatory Networks" (2021) **In Preparation**.

-. Johnson, N.F., N., Velasquez, Jha, O., Leahy, R., Johnson Restrepo, N., Sear, R., Manrique, P., Lupu, Y., **Devkota, P.**, Wuchty, S., Goldberg, B. "Covid-19 infodemic reveals new tipping point epidemiology and a revised R formula" (2021) **In Submission**.

-. **Devkota, P.**, Manrique, P., Zheng, M., Johnson, N.F., Wuchty, S., "Resurgence of Online Hate Group Activity Reveals New Viral Epidemiology" (2021) **In Submission**.

1. Chamling, X., Kallman, A., Fang, W., Berlinicke, C., Mertz, J., **Devkota, P.**, Pantoja, I. M., Smith, M., Ji, Z., Chang, C., Kaushik, A., Chen, L., Whartenby K., Calabresi P. A., Mao, H., Ji, H., Wang, T., Zack, D.J. "Single-cell transcriptomic reveals molecular diversity and developmental heterogeneity of human stem cell-derived oligodendrocyte lineage cells" *Nature Communications.* (2021).

2. **Devkota, P.**, Danzi, M., Lemmon, V., Bixby, J., Wuchty, S., "Computational Identification of Kinases that Control Axon Growth in Mouse," *SLAS Discovery.* 2020.

3. **Devkota, P.**, Wuchty, S., "Controllability analysis of molecular pathways points to proteins that control the entire interaction network" *Scientific reports.* (2020).

4. Boltz, T. A., **Devkota, P.**, Wuchty, S., "Collective influencers in protein interaction networks." *Scientific reports.* (2019).

5. Johnson, N.F., Leahy, R., Johnson Restrepo, N., Velasquez, N., Zheng, M., Manrique, P., **Devkota, P.**, Wuchty, S., "Hidden resilience and adaptive dynamics of the global online hate ecology" *Nature* 573 (2019).

6. **Devkota, P.**, Danzi M, Wuchty, S., "Beyond degree and betweeness centrality: Alternative topological measures to predict viral targets," *PloS-one* (2018)

7. Goodacre, N., **Devkota, P.**, Bae, E., Wuchty, S., Uetz, P., "Protein-protein interactions of human viruses," *Seminars in Cell & Developmental Biology.* Academic Press, 2018.

Poster Presentation

1. **Devkota, P.**, Kirkpartrick, B., Blanton, S., Bouchard-Côtè, A., "Correcting for Cryptic Relatedness in Genome-Wide Association Studies," *23rd Annual International Conference on Intelligent System for Molecular Biology 14th European Conference on Computational Biology (ISMB/ECCB)*, 2015.

Work Experience

Sniperdyne Systems, Belleville, IL
Software Developer May. 2008 - Aug. 2014
Responsible for developing ERP integrated eCommerce system. Involved in the creation of a custom SQL replication tool that synced data using web services. Integrated 3rd party shipping, payment, and tax solutions to the in-house eCommerce complete with CMS.

Teaching Experience

Teaching Assistant, University of Miami, Miami, FL

- CSC 427 - Theory of Computations — Spring 2016
- CSC 220 - Computer Programming II — Fall 2019
- CSC 645 - Introduction to Artificial Intelligence — Fall 2019
- CSC 210 - Computing for Scientists — Spring 2020

Awards

- Outstanding TA for 2020 (among CS graduate students) — University of Miami
- UM Fellow — University of Miami
- Presidential Scholar — McKendree University
- Dean's List — McKendree University

Skills

JAVA, C++, R, Python, ASP.Net, PHP, C#, MSSQL, MySQL, MongoDB, Javascript