Michael Toomey

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Summary

Junior B.S. Candidate in Computer Science student. Interested in using computational methods to analyze biological phenomena. Skills include data analysis, programming, and communication. Experience working with genome sequencing, RNA-Seq, and metabolic data.

Education

Washington University in Saint Louis Expected Graduation: May 2018
Bachelor of Science in Computer Science GPA: 3.77/4.0
Minor in Bioinformatics
Relevant Coursework: Genomics, Probability and Statistics, Introduction to Machine Learning, Introduction to Artificial Intelligence, Algorithms for Computational Biology, Multi-Agent Systems, Differential Equations, Data Structures and Algorithms, Introduction to Systems Software.

Research Experience

Computational Biology Group – Brent Research Group Washington University in St. Louis
Undergraduate Researcher May 2016 - Present

- ·Implement expression analysis pipelines for analyzing RNA-seq data.
- ·Visualize gene networks and search for biologically interesting gene interactions.
- ·Integrate different various data sources to build support for hypotheses about gene networks.
- ·Perform data quality control using methods such as principal components analysis, regression, etc.
- ·Write and maintain code for analyzing cellular metabolic fluxes.
- ·Support running chemostat experiments for yeast metabolism and expression characterization experiments.

Chromatin and Genome Structure – Genomics Education Partnership Washington University in St. Louis
Student Researcher January 2017 – May 2017

- ·Leveraged biological knowledge and computational tools such as hidden Markov models to discover gene-coding regions and regulatory elements in *Drosophila eugracilis* genome.
- ·Analyzed 454 and Illumina sequencing data for finishing of *Drosophila ficus phila* genome.
- ·Learned advantages and disadvantages of various sequencing techniques.
- ·Wrote about methods and findings in scientific report to be used by others as model for similar work.

Genetic Circuit Design - Moon Research Group Washington University in St. Louis
Undergraduate Researcher February 2015 - May 2016

- ·Designed and cloned plasmids for research in engineering of nitrogen-fixation capabilities.
- ·Wrote programs for auto-generating small guide RNA sequences for use in CRISPR-Cas9 applications.
- ·Presented research for panel of Monsanto scientists and poster at synthetic biology symposium organized by Monsanto Company.
- ·Presented research at the at the iGEM synthetic biology research conference in Boston in September, 2015.

Technical Skills

Software and Programming

- ·Proficient in Python, R, Mathematica, Java; Familiar with C++, MATLAB, Linux OS; Experience with C, VHDL, Arduino C, cluster computing.

Equipment

- ·PCR Themocyclers, Chemostats, Arduino Microcontroller Boards, Field-Programmable Gate Arrays.

Leadership and Mentor Experience

Washington University Residential Life Washington University in St. Louis
Resident Advisor August 2016 - Present

- ·Provide resources and mentorship for new students looking for academic and social assistance.
- ·Facilitate discussions with students centered around issues relating to future plans, social justice issues, etc.
- ·Assist students who require help from residential life and the university.

Washington University First Year Center Washington University in St. Louis
Washington University Student Associate August 2015 - May 2016

- ·Supervised new students during orientation.
- ·Provided resources and advice for new students looking for academic and social assistance.
- ·Spent two hours per week talking to new students.
- ·Created events and special programming for new students.