

Michael Toomey

Current Location: St. Louis, MO | johntoomey(at)wustl.edu

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 Thermocyclers, 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.