Joseph Burke

(248) 565-7016 • Burkej24@msu.edu

Education

Michigan State University, Lyman Briggs College   **May 2022**
Bachelor of Science, Genomics and Molecular Genetics
Minor in Computer Science

Work Experience

Computational Systems Biology (Ravi) Lab, *East Lansing, MI*   **June 2021 - Present**
Undergraduate Research Assistant
- Collaborated with wet lab biologists and computational biologists to develop an integrated computational evolutionary framework, via R shiny, to bring together molecular evolution, phylogeny, and pangenomics to discover distinctive protein/genomic features relevant to biological comparisons of interest

Lyman Briggs College, *East Lansing, MI*   **September 2020 - Present**
Undergraduate Teaching Assistant
- Served as a UTA for Lyman Briggs Biology 1: Organismal Biology
- Created and graded content for the lab portion of the class
- Mentored students through the process of creating and presenting their own research projects

Apeel Sciences, *Santa Barbara, CA*   **June 2021 - August 2021**
Biological Sciences Intern
- Collaborated with biologists and analytical chemists to design and implement a MongoDB database and API in the cloud for efficient storage and retrieval of large-scale plant genomic, bacterial genomic, and LC-MS data
- Created streamlined pipelines for bacterial genome assembly, annotation, and taxonomic classification using tools such as Flye, medaka, Prokka, BUSCO, Kaiju, and ANVIO to reduce analysis time from days to hours.
- Installed and managed computational tools in AWS EC2 instances for use by biologists
- Advised wet lab biologists on common practices in bioinformatics analyses

Plant Genomics (Buell) Lab, *East Lansing, MI*   **September 2019 – April 2021**
Undergraduate Research Assistant
- Analyzed high throughput NGS sequencing data through tools such as SAMTools, Hisat2, CuffLinks, and DESeq 2 in Linux/Unix environments
- Created a gene-based MongoDB database for storing sequence and analysis data for *Salvia hispanica*
- Created a RESTful API for querying a MongoDB genomic database using Python and FastAPI
- Created a dynamically rendered database search page that consumes data from an API in JSON format using Vue.js
- Managed online presence for The Plant Resilience Institute at Michigan State University using the MURA content management system

Dr. Kay Holekamp Research Lab, *East Lansing, MI*   **September 2018 – May 2019**
Undergraduate Research Assistant
- Collaborated with a team to collect and compile sets of data into Excel/Access and analyzed the data with R to determine the function of the giggle vocalization in hyenas
- Created and presented a professional poster at the University Undergraduate Research and Arts Forum displaying the results of the overall work

Publications

Gina M Pham, John P Hamilton, Joshua C Wood, **Joseph T Burke**, Hainan Zhao, Brieanne Vaillancourt, Shujun Ou, Jiming Jiang, C Robin Buell. (2020). Construction of a chromosome-scale long-read reference genome assembly for potato, *GigaScience*.