Kyle A. Johnsen

kjohnsen@gatech.edu

EDUCATION

2019- **Georgia Institute of Technology/Emory University**
Atlanta, GA
PhD, Biomedical Engineering, computational neuroengineering minor

2015-19 **Brigham Young University**
Provo, UT
BS, Bioinformatics, computer science minor

RESEARCH/RELEVANT WORK EXPERIENCE

2019- **PhD Student**—Christopher Rozell, PhD, Georgia Tech. Developing and studying methods for closed-loop control of neural activity. Leveraging them to address previously unanswerable questions in collaboration with neuroscientists.

2019 **Software Engineering Intern**—FamilySearch, LLC; Lehi, UT. Developed and maintained code for delivering personalized family history experiences to millions of patrons. Leveraged modern software/data science tools in an Agile team environment.

2016-19 **Undergraduate Research Assistant**—Jonathon Hill, PhD, BYU. Led team developing mutation-mapping R package for release on open-source Bioconductor platform.

2018 **Software Development Intern**—Robert Burton, PhD, Center for Genomic Interpretation; Sandy, UT. Collaborated in full-stack development of prototype for clinical genetics data-mining web application with interdisciplinary team. Spearheaded design and implementation of database.

2018 **Undergraduate Research Assistant**—Mark Clement, PhD, BYU. Performed computational analyses to assess biological validity of experimental whole-genome phylogenetics software.

2017 **Undergraduate Research Assistant**—Jeffrey Coleman, PhD, Auburn University Computational Biology REU. Analyzed and compared pathogenic fungus genomes. Trained in a variety of tools and processes, including genome assembly and annotation, metagenomics, and physical computing.

2016 **Undergraduate Research Assistant**—James Schnable, PhD, University of Nebraska-Lincoln Bioenergy REU. Conducted high-throughput digital phenotyping and quantitative maize genetics analysis.

2013 **Lab and Data Analysis Intern**—Jacqueline Siy-Ronquillo, Ph.D, Navillum Nanotechnologies; Salt Lake City, UT. Automated data analysis process, increasing speed by over 500%. Assisted in daily quantum dot synthesis experiments, handling reagents and performing photoluminescence analyses.

HONORS AND AWARDS

2022	Trainee Highlight Award Honorable Mention NIH BRAIN Initiative PI Meeting
2019-	GT/Emory Computational Neural Engineering Training Program Scholar NIH T32 Institutional Training Grant
2015-19	Heritage Scholarship, Brigham Young University, 4 years full tuition
2017	Auburn University Computational Biology REU Admission
2017	Dean's List, College of Life Sciences, Brigham Young University
2015-17	Utah Regents' Scholarship State-funded scholarship based on academic achievement
2016	University of Nebraska-Lincoln Bioenergy REU Admission
2015	National Merit Scholarship

POSTER/ORAL PRESENTATIONS

2023	**Enhancing the Cleo experiment simulation testbed to support all-optical control, multi-channel optogenetics, and easier integration into data analysis pipelines** Society for Neuroscience Conference, Washington, DC. Poster.
2023	**Enhancing the Cleo experiment simulation testbed to support all-optical control, multi-channel optogenetics, and easier integration into data analysis pipelines** SNUFA workshop, virtual. Poster.
2022	**CLOCTools: A library of tools for closed-loop neuroscience** Society for Neuroscience Conference, San Diego, CA. Poster
2022	**Cleo: a simulation testbed for bridging model and experiment in mesoscale neuroscience** SNUFA Workshop, virtual. Poster.
2022	**Cleo: a simulation testbed for bridging model and experiment in mesoscale neuroscience** CRCNS PI Meeting, Atlanta, GA. Poster.
2022	**Cleo: a simulation testbed for bridging model and experiment in mesoscale neuroscience** Neuromatch Conference 5.0. Flash talk.
2022	**CRCNS: Closed-loop computational neuroscience for causally dissecting recurrent circuits** BRAIN Initiative PI Meeting, virtual. Poster.
2022	**CRCNS: Closed-loop computational neuroscience for causally dissecting recurrent circuits** Georgia Tech/Emory Neural Engineering Center Research Expo. Poster.
2021	**CRCNS: Closed-loop computational neuroscience for causally dissecting recurrent circuits** BRAIN Initiative PI Meeting, virtual. Poster.

2021 **A simulation framework and testbed for studying and prototyping closed-loop neural control methods**
Neuromatch Conference 4.0. Flash talk.

2018 **Exploring the Validity of *Kleuren* Output**
Student Research Conference, College of Physical and Mathematical Sciences, Brigham Young University. Oral presentation.

2017 **MMAPPR 2.0: Improved Genetic Mapping for Forward Genetic Screening**
Society of Developmental Biology, Southwest Chapter Regional Meeting, Houston, TX. Poster.

2017 **Comparative Genomics Analysis of a Sequence Type 33 Clinical Isolate of *Fusarium oxysporum***
Undergraduate Summer Research Scholars Symposium, Auburn University. Poster.

2016 **Maize Association Studies with High-throughput Image-based Phenotype Collection**
Nebraska Summer Research Symposium, University of Nebraska-Lincoln. Poster.

RESEARCH MENTORSHIP EXPERIENCE

MS students

Anushka Chaudhari (2023)

Tobias Niebur (2021)

Undergraduate students

Ryan Ouyang (2024-)

Aidan Sawyer (2024-)

Myqui Ngyuen (2023)

Dev Patel (2023-)

Aarav Shah (2023-)

Maham Mehmood (2023)

Mahta Tavafoghi (2023)

Raahi Jogani (2023-)

Minkun Lei (2023)

Zachary Menard (2022-23)

Jonathan Maldonado (2022-23)

Olivia Klemmer (2022-23)

Alissa Wang (2022-23)

Jake Miller (2022-)

Brendan Hogge (2018-19)

Autumn Griffin (2018)

Gabriel Cano (2018)

Adam Bayer (2018)

TEACHING EXPERIENCE

2020-21 **Teaching Assistant, Biomedical Engineering 3110—Quantitative Engineering Physiology Laboratory I, Georgia Tech**
Helping students develop research skills such as literature review, hypothesis generation, experimental design, and analysis by mentoring group projects, giving feedback during the process, and grading final submissions. Projects

involve using self-constructed EKG and EMG circuits to answer original physiology research questions.

2019 **Teaching Assistant, Computer Science 240—Software Design & Testing, BYU**
Taught students software design principles at a conceptual level and helped them apply them in a full-stack Android app/web server game project.

2018 **Teaching Assistant, Computer Science 418—Bioinformatics, BYU**
Assisted students in algorithmic coding projects as well as integrated scientific publication-style bioinformatics assignments. Graded coursework.

2017 **Teaching Assistant, Computer Science 236—Discrete Structures, BYU**
Taught principles of discrete mathematics and assisted students in their implementation in coding projects. Graded assignments and exams.

ACADEMIC AND PROFESSIONAL SERVICE

2022	**Web developer**, CRCNS PI Meeting, October 2022
2022	**Creative consultant**, "Step the Brain Along a Path" lobby installation, Ferst Center for the Arts at Georgia Tech, Sep. 2022. Part of a team creating audiovisual materials and interactive experiences from neuroscience data.
2020-21	**Annual events committee,** Computational Neuroengineering Training Program. Helped plan annual retreats, social events, and onboarding of new students.
2021	**Organizing committee**, GT/Emory Neural Engineering Center Motion Analysis Tutorial, March 20, 2021.
2017	**Organizer**, Multicultural Celebration, Auburn University. Independently planned event held on Auburn University campus with 20-30 attendees
2016-17	**Executive Director**, "Service Dates" student service organization, Brigham Young University. Led team in designing and implementing community service projects for student volunteers

OPEN SOURCE PROJECTS

Cleo	Closed-Loop, Electrophysiology, and Optogenetics experiment simulation testbed. Bridges spiking neural network models and experiments using the Brian 2 spiking neural network simulator.
tklfp	Teleńczuk Kernel LFP. Python package for facilitating LFP approximation method from Teleńczuk et al., 2020.
MMAPPR2	Mutation Mapping Analysis Pipeline for Pooled RNA-seq. Identifies and ranks candidate putative mutations resulting from forward genetic screens. Available as R package on Bioconductor.

COMPUTATIONAL SKILLS

Languages	Advanced Python Intermediate C++, Java, R Basic Julia, MATLAB, Scala
Technologies	Cluster computing, AWS, Spark, SQL databases, Git
Practices	Collaborative Git-based development, continuous integration, automated testing and documentation, Agile development
Frameworks	CMake, Bioconductor, Spring Boot, Android, Flask

LANGUAGES

English	Native speaker
Spanish	Full professional proficiency
German	Professional working proficiency
Mandarin Chinese	Intermediate proficiency