Ryan Ellison, PhD

Neuroscientist | NeuroAI Researcher-Practitioner

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Research Interests

Neuroscience: Motor control and central pattern generation; dynamic systems in biological neural networks; systems and sensory neuroscience (vision and audition); space neuroscience and human performance.

Computational Neuroscience: Computational and theoretical neuroscience; connectomics and large-scale brain network organization; neuroinformatics; data-driven modeling of neural systems.

NeuroAI, Neuroengineering & Intelligent Systems: NeuroAI and brain-inspired artificial intelligence; artificial systems neuroscience; machine learning and artificial neural networks; autonomous and intelligent systems.

Experience

Entrepreneurial & Research Leadership

scryAI, LLC — *Elko, NV*

Co-Founder | Chief Technology Officer — *01/2025 - Present*

- scryAI is a private neuroAI research and development playground company focused on the investigation and construction of neurobiologically-inspired AI systems. Work undertaken at scryAI integrates fundamental neuroscience and machine intelligence to derive computational architectures whose structural organization and dynamical properties reflect those observed in biological neural systems. For example, a computer-vision model (scANN; Surround-Center Artificial Neural Network) was developed predicated on the center-surround microcircuit of the vertebrate retina, implementing core organizational principles of retinal information processing within an artificial neural architecture. Additional research has investigated analogous sensory-system frameworks in audition, including cochlea-inspired resonator models and hybrid systems combining neurobiologically-motivated signal processing with multimodal large language models and advanced prompting techniques for sound-source separation and speaker diarization, alongside the development of algorithms for identifying functional subnetworks within large structural neural networks.

data.ai, LLC — *Williamstown, WV*

Founder | Head of Research, Innovation, and Teaching — *06/2022 - Present*

- data.ai is an AI facilitation and research company focused on enabling organizations to develop AI/ML capabilities by leveraging the value embedded within their internal data. Work undertaken at data.ai integrates AI education, collaborative research, and applied technology development to assist organizations in identifying opportunities for data-driven transformation and implementing predictive or automated solutions. For example, courses and laboratory instruction in programming, data science, AI/ML, and emerging technologies have been developed and delivered to governmental, corporate, and international organizations across domains including public/forgein policy, defense, healthcare, and finance through Data Society, a data.ai partner. Additional work has involved the development of frameworks for organizational transformation aimed at facilitating the adoption, deployment, and operational integration of advanced AI/ML systems and collaborative research and development of AI/ML technologies.
- See Pedagogy for courses instructed.

TechNeurology, LLC — *Marietta, OH*

Co-Founder | President — *04/2015 - 04/2016*

- TechNeurology's goal was to develop a biomedical technology capable of identifying mild traumatic brain injury or concussion in the immediate post-injury period outside of dedicated clinical environments. The proposed system combined an interactive neuropsychological assessment interface with an automated analytical pipeline designed to evaluate behavioral responses alongside physiological measurements like electroencephalographic (EEG) activity. The platform sought to integrate digitized cognitive testing with biometric telemetry to detect neurological abnormalities consistent with coup-contrecoup injuries or related traumatic brain dysfunction. The overall objective was to enable rapid screening and preliminary diagnostic insight in field or emergency settings where traditional neurological evaluation may not be immediately available.

Government Research

Universities Space Research Association (USRA; NASA Contractor) — *Cleveland, OH*

Ph.D. Intern | Computational Neuroscience, AI/ML — *01/2021 - 02/2022*

- As part of the Microgravity Research Division, in support of the Human Research Program, on the Cross-cutting Computational Modeling Project, the dynamic macroscopic brain model - a neural network, neural ensemble model - previously developed during tenure at NASA (see item below) was subjected to a complete emulation of the hypogravity space stressor. The resulting electrophysiological data of the model was analyzed using unsupervised machine learning techniques to identify which brain regions in the visuomotor control network produced aberrant activity in comparison to brain regions in the Earth-gravity model. Under the assumption that these brain regions contribute to abnormal visuomotor movement in space, this work has the potential to help NASA identify regions as countermeasure targets, preserving the functional capabilities of astronauts.

National Aeronautics and Space Administration (NASA)

Cleveland, OH

Ph.D. Intern | Computational Neuroscience, AI/ML

01/2020 - 09/2020

- In support of the Human Research Program, on the Cross-cutting Computational Modeling Project and as a part of the Central nervous system, Behavioral medicine, and Sensorimotor systems Team, a modularity algorithm was developed to identify from whole-brain connectome datasets subnetworks (brain performance pathways) responsible for mission-critical task performance. On top of the visuomotor subnetwork defined by the algorithm, a dynamic macroscopic brain model - a neural network, neural ensemble model - was developed. Preliminary work on emulating the effects of a space stressor (i.e., hypogravity) on the model's local-field-potential activity was begun. The overarching goal was to develop a biophysical, high-level model to help assess health and performance risks, enhance countermeasure development, and predict acceptable human-performance limits in astronauts during long-term space travel, preserving functional capabilities.

Industry

2U | edX

Lanham, MD

Instructional Specialist | Data Analytics, Data Vizualization

03/2023 - 01/2024

- Pedagogical duties included the academic support of students as a member of the instructional staff through a didactic application known as AskBCS, where students submit technical questions about the curriculum (e.g., regarding their code, developed programs, engineered models, etc.).
- Overview of curriculum: Excel, Virtual Basic for Application (VBA), Python, data analysis using pandas, SQL, advanced SQL (sqlalchemy), data collection (web scraping using beautifulsoup), NoSQL (MongoDB), interactive visualization and mapping (JavaScript), Tableau, unsupervised machine learning, supervised machine learning, artificial neural networks including deep learning, and big data.

Academia

Ohio University (Neurophys. and Comp. Neuroscience Laboratory)

Athens, OH

Postdoctoral Researcher | Neuroscience, NeuroAI

01/2024 - 01/2025

- Postdoctoral research focused on the integration of experimental neuroscience, computational neuroscience, and NeuroAI approaches to investigating neural dynamics, large-scale brain network organization, and neurally inspired AI systems. Work extended doctoral investigations into the role of neuromodulatory GABAergic input in the pyloric neural network of the stomatogastric nervous system in producing quintessential rhythmic activity in a biological neural network, while further advancing computational methods for identifying functional subnetworks from large structural brain networks through continued development of the Double Anchor Network Selection (DANS) algorithm. Additional projects combined dynamic systems modeling and electrophysiological experimentation to investigate the regularization of irregular bursting neurons through stochastic perturbations. Parallel research explored neurobiologically inspired AI systems and computational technologies for electrophysiological data analysis through statistical modeling, including the early development of sensory-system-inspired neural AI architectures and the creation of expoFitter, a visualization and nonlinear model-fitting platform for electrophysiological data.
- Exogenous Courses/Workshops/Etc.: Understanding Machine Learning: Basics and Algorithms (MIT Institute of Data, Systems, and Society, Data Science & Machine Learning; 03/13/2024); How to Navigate the Peer Review Process (Soc for Neurosc/Elsevier; 02/28/2024)

Ohio University

Athens, OH

GTA, Instructor of Record, GRA | Biological Sciences

01/2016 - 12/2023

- Pedagogical duties included giving pre-lab lectures, leading wet- and dry-laboratory experiments, completing dissections, performing in-class demonstrations, discussing data and connecting results to underlying scientific concepts, giving examination review lectures, constructing quizzes and examinations in traditional and practical formats, proctoring and administering quizzes and examinations, and holding weekly office hours.
- See Pedagogy for courses instructed.

Ohio University (Neurophys. and Comp. Neuroscience Laboratory)

Athens, OH

Laboratory Technician

10/2015 - 01/2016

- Completed introductory work and familiarization with computational and experimental techniques and methodologies of the lab, invertebrate crustacean anatomy and physiology, gross and fine dissections of animal preparation, and the then-ongoing research in preparation for admittance into Ohio University's Biological Sciences Neuroscience graduate program.

WVU Center for Neuroscience (Neural Engineering Laboratory)

Morgantown, WV

Research Assistant

08/2012 - 05/2015

- Investigated skill acquisition and retention of learned sensorimotor movements in healthy and stroke-induced rats. This work suggested that motor planning control pathways diverged to disparate pre-motor areas before re-converging to the primary motor cortex for execution.
- Helped develop a patented ambulatory behavioral assay that distinguishes between cortical and spinal contributions to locomotion, with the goal being to assess cortical impairment due to neural insult from observation of forced asymmetric locomotor activity.

WVU HSC Office of Laboratory Animal Resources

Morgantown, WV

Laboratory Technician, Research Aide

03/2012 - 08/2012

- Maintained research animal housing facilities through cage sanitation, equipment cleaning, autoclave operation, and preparation of laboratory animal housing.
- Monitored research animals during routine husbandry, documenting health observations and reporting signs of illness, injury, pain, or distress to supervisory and research personnel.
- Assisted in maintaining sanitary, organized, and compliant animal care environments in support of biomedical research.

Education

Ohio University
Athens, OH

Ph.D. | Neuroscience | Neuro[electro]phys., Comp. Neuroscience, AI/ML *2023*

- Research: Macroscopically, I focused on the development of a novel modularity algorithm predicated on neuroscientific knowledge of sensorimotor integration and transformation in the brain that reduces whole-brain connectomes to task-specific subnetworks, focusing on visuomotor movement. Moreover, using the the resulting visuomotor subnetwork as a structural basis, I developed a macroscopic neural network, neural ensemble model that produces local-field-potential neural activity and subjected said model to an emulated space stressor (i.e., hypogravity) to investigate, utilizing unsupervised machine learning, which brain regions in the visuomotor control network may be responsible for aberrant visuomotor movement. Microscopically, I investigated slow biophysical processes in dynamic systems (i.e., rhythmic, oscillatory motoneurons in a central pattern generating, biological neural network). Specifically, I focused on the description, mechanistic causation, and effect of unexplored slow processes (i.e., intracellular calcium dynamics and neuronal currents) and the role they play in shaping individual neural dynamics, as well as network dynamics, in the lobster pyloric neural network.
- Exogenous Courses/Workshops/Etc.: Generative AI: Interactive Seminar (FSI/Data Society; 11/16/2023); Generative AI: Prompt Engineering for Beginners (IQVIA/Data Society Webinar; 9/27/2023); Machine learning workflow with tidymodels in R (Workshops For Ukrain; 7/27/2023); Leading with Generative AI (Data Society; 5/11/2023), The Virtual Brain in Clinical Research (Charité/Bernstein Center Computational Neuroscience Berlin; 6/28/2022 - 9/12/2022), Deep Learning with Keras and TensorFlow in R (UseR!; 10/28/2020), Shiny meets electron: Turn your shiny app into a standalone desktop app in no time (UseR!; 10/28/2020), Shiny [app] from Start to Finish (rstudio::conf; 1/27/2020 - 1/28/2020), Using NEURON to Model Cells and Networks (Soc for Neurosc; 11/10/2017), Applied Machine Learning (rstudio::conf; 1/15/2019 - 1/16/2019), Machine Learning in Neuroscience: Fundamentals and Possibilities (Soc for Neurosci; 6/26/2019).
- Board Topics: Human neuroscience (motor control); second-messenger systems; computational neuroscience (biophysical neuron model current compositions); dynamic systems; calcium signaling.
- Dissertation: See dissertation in publications section.

West Virginia University
Morgantown, WV

B.Sc. | Biology | Physics *2015*

- Additional coursework projects included the development of a Geiger counter using embedded hardware and associated programming for an ionospheric measurement rocket experiment conducted in collaboration with NASA, as well as astrophysics work using the WVU physics observatory to investigate the position of Jupyter's Galilean moons.
- Research: See WVU Center for Neuroscience in Experience for Neural Engineering Lab research.

West Virginia University
Morgantown, WV

B.Sc. | Psychology *2015*

- Clinic: See WVU SoM | Dept. of Behav. Med. and Psych. | Clinical Neuropsych in Internships.
- Research: See WVU Center for Neuroscience in Experience for Neural Engineering Lab research.

Internships

WVU SoM | Dept. of Behav. Med. and Psych. | Clinical Neuropsych.
Morgantown, WV

Clinical neuropsychology intern *05/2014 - 08/2014*

- Interned with Dr. Jennifer Wiener Hartzell and Dr. Kirk Bryant for 272 hours.
- Examined and administered behavioral assays to patients in clinic and in hospital.
- Consulted with neuropsychologists about observations and diagnoses of patients.
- Participated in didactics such as neuropsychological case conferences and neurology and psychiatry grand rounds.

Camden-Clark Medical Center | WVU SoM | Parkersburg Cardiology
Parkersburg, WV

Clinical interventional cardiology intern *03/2012 - 03/2012*

- Interned with interventional cardiologist Dr. Chris Miller.
- Attended/participated in clinical and ward services.
- Scrubbed in on several cardiac catheterizations.

The Brain and Spine Institute | PARS Neurosurgical Associates
Parkersburg, WV

Clinical neurosurgical intern *03/2012 - 03/2012*

- Interned with neurosurgeon Dr. Rammy Gold.
- Attended/participated in clinical services, as well as surgical procedures.
- Attended or scrubbed in on several spinal surgeries.

Research & Development Contributions

Publications

Dissertation

- **Ellison, R.** (2023). Computational Neuroscientific Approaches to Investigate Dynamic Properties of Macro and Micro Motor Systems. [Doctoral dissertation, Ohio University]. OhioLINK Electronic Theses and Dissertations Center.

Manuscripts

- **Ellison, R.**, Matar, M., Gokoglu, S.A., Prabhu, R.K., and Hooper, S.L. (2024). An algorithm for identifying task-specific brain subnetworks using the visuomotor system as an example. *bioRxiv*, 2024.05.13.593972. doi: `https://doi.org/10.1101/2024.05.13.593972`

- **Ellison, R.**, Matar, M., Gokoglu, S.A., and Prabhu, R.K. (2022). Macroscopic model of hypogravity-induced primate brain activity via identification and analysis of a neurovisuomotor performance pathway, *Research Square*, doi: `https://doi.org/10.21203/rs.3.rs-2142272/v1`.
- Tuntevski, K., **Ellison, R.**, & Yakovenko, S. (2016). Asymmetric walkway: A novel behavioral assay for studying asymmetric locomotion. *J. Vis Exp (JoVE)*, 107, e52921, `doi:10.3791/52921`.
- **Ellison, R.** (2015). Iterations of diagrammatic solutions of the cable equation using arbitrary dendritic geometry. *GRIN - Biology/Neurobiology*, catalog number: V315980.

Manuscripts Awaiting Submission

- **Ellison, R.**, Matar, M., & Gokoglu, S.A., Prabhu, R.K., and Scott L. Hooper. Double-Anchor Network Selection (DANS): A novel algorithm for identifying subnetworks connecting two brain regions, exemplified here using the visuomotor system.
- **Ellison, R.**, Matar, M., & Gokoglu, S.A., Prabhu, R.K., and Scott L. Hooper. Macroscopic model of DANS-identified visuomotor subnetwork for structural analysis and sufficiency testing.
- **Ellison, R.**, Matar, M., & Gokoglu, S.A., Prabhu, R.K., and Scott L. Hooper. Primate brain visuomotor network simulations identify multiple hypogravity-affected brain regions and suggest hypogravity acts primarily by reducing neural excitation.
- Hooper, S.L., Hobbs, K.H., Mantziaris, C., Thuma, J.B., and Stover, K.K., **Ellison, R.**. Using Laplacian eigenmapping to identify patterns in high-dimensional biological time-series data.
- Hooper, S.L., Hobbs, K.H., and **Ellison, R.**. Detailed explanation of Laplacian eigenmapping with fully worked out examples.
- Hooper, S.L., Hobbs, K.H., and **Ellison, R.**. Eigenvalues, eigenvectors, and why they are important.
- Bauer, S.W., F-C., Jeng., **Ellison, R.**. Bridging generative AI and clinical audiology: A framework for multimodal synthetic data generation and validation.
- Bauer, S.W., F-C., Jeng., **Ellison, R.**. From Cochlear Function to Diagnostic Decision: A Cascaded Neural Architecture for Automated Neonatal Hearing Assessment

Manuscripts in Progress

- **Ellison, R.**, Thuma, J.B., & Hooper, S.L. I_{KCa} trajectory reveals extremely slow (seconds-long) $[Ca]_i$ removal dynamics in a lobster ploric neuron.
- **Ellison, R.**, Pomorski, K., Young, T., & Hooper, S.L. A very slow I_h current allows inherently slow oscillating lobster pyloric neurons to couple 1:1 with relatively high-frequency driving inputs.
- **Ellison, R.** and Hooper, S.L. Descending GABAergic input allows 1:1 coupling of fast drivers and slow oscillatory followers by transformation of the followers into tonic spikers.
- Hooper, S.L. and **Ellison, R.**. Clarifying the physical assumptions of the Goldman-Hodgkin-Katz voltage equation in neuronal membranes.
- Hooper, S.L., **Ellison, R.**, Hobbs, K.H., Guschlbauer, C., and Thuma, J.B. Differential equation based modeling of dynamic power laws without assuming an underlying system of simpler components using muscle passive force as an exemplar.
- **Ellison, R.**. dansR and rustyDans: R and Python package implementations of the DANS network-selection algorithm.

Internal NASA Deliverables

- **Ellison, R.**, Matar, M., and Gokoglu, S., and Prabhu, R. (2022). Analysis of structural visuomotor subnetwork and macroscopic visuomotor model of brain activity subjected to hypogravity identifies consequential control regions.
- **Ellison, R.**, Matar, M., and Gokoglu, S. (2020). An optimized visuomotor node-and-module model of brain activity when subjected to hypogravity.
- **Ellison, R.**, Matar, M., and Gokoglu, S. (2020). A visuomotor node-and-module model of brain activity in primates.

Abstracts and Poster Presentations

- **Ellison, R.**, Matar, M, Gokoglu, S.A., and Prabhu, R.K. *Identification and analysis of visuomotor brain performance pathway and macroscopic model of primate brain activity subjected to hypogravity*. HRP IWS, 2022. Abstract Number: 1133 - 000211.
- **Ellison, R.**, Matar, M., & Gokoglu, S. *An optimized visuomotor node-and-module model of brain activity when subjected to hypogravity*. NASA Headquarters, 2020.
- **Ellison, R.**, Matar, M., & Gokoglu, S. *A visuomotor node-and-module model of brain activity in primates*. NASA Headquarters, 2020.
- **Ellison, R.** & Hooper, S.L. *Alteration of a slow conductance transforms a slow endogenous burster into a post-inhibitory rebounder capable of coupling 1:1 with fast pacemaker neurons*. Ohio University Neuroscience Research Day, 2017.
- **Ellison, R.**, Bryant, K., Wilson, C., & Gonzalez, J. *Late-onset Rasmussen's encephalitis: A neuropsychological case study*. Int. Neuropsych. Soc., 2015. ID: 2072413.
- **Ellison, R.**, Pollard, A., Priestas, M., & Yakovenko, S. *Insights from modeling the process of learning a pair of similar visuomotor tasks in rats*. Soc. for Neurosci., 2014. Abstract Control Number: 14379.

- Tuntevski, K., **Ellison, R.**, Shaffer, J.E., & Yakovenko, S. *Asymmetric walkway: Novel behavioral assay for studying asymmetric locomotion*. Soc. for Neurosci., 2014. Abstract Control Number: 14689.
- Tuntevski, K., **Ellison, R.**, Shaffer, J.E., & Yakovenko, S. *Asymmetric walkway: Novel behavioral assay for studying asymmetric locomotion*. West Virginia University Van Liere Convocation and HSC Research Day, 2014.
- **Ellison, R.**, Pollard, A., Priestas, M., & Yakovenko, S. *Model of sensorimotor skill acquisition in rats*. West Virginia University Center for Neuroscience Annual Retreat, 2013.

Lab Manuals

- Hooper, S.L. & **Ellison, R.** (2021). Lab 8/9 - Stomatogastric neural, muscle, and neurosimulation lab. *BIOS 3435 - Principles of Physiology Lab*. Developed corresponding altered didactic ACTIONPOTENTIAL NEURON program.
- Schwirian, C. & **Ellison, R.** (2016). Lab II - Action potentials and basic neural function. *BIOS 3455 - Human Physiology Lab*. Developed corresponding didactic ACTIONPOTENTIAL NEURON program.

Science Software and Computational Technologies

Research Software

- **Ellison, R.** (2024). *expoFitter*: Electrophysiological data analysis and nonlinear model-fitting application.
- **Ellison, R.** (2020). *repoMan*: Terminal utility for automated repository construction across standardized computational development workflows.
- **Ellison, R.** and Hooper, S.L. (2020). *3dViz*: Multidimensional scientific data visualization dashboard.

Educational Software

- **Ellison, R.** and Hooper, S.L. (2021). *ACTIONPOTENTIAL II*: Neurosimulation environment for biophysical investigation using conductance-based neuronal models.
- **Ellison, R.** (2016). *ACTIONPOTENTIAL I*: NEURON-based virtual laboratory for neuronal electrophysiology.

Scientific Packages

- **Ellison, R.**. *neuRon*: Idiomatic R interface to the NEURON simulation environment. **Architecture and API design.**
- **Ellison, R.**. *rustyDANS*: Python implementation of the Double Anchor Network Selection algorithm with Rust-designed computational engine. **Active development.**
- **Ellison, R.**. *dansR*: R implementation of the Double Anchor Network Selection algorithm. **Release candidate (final testing).**

AI Systems

- **Ellison, R.**. (Prototyped: 2025; Validated: 2026). *Jessica*: Generative static code analysis and technical reporting agent. **Release candidate (final testing)**.
- **Ellison, R.**. (Prototyped: 2024; Validated: 2025). *TABby*: Teaching-assistant agent for lecture analysis, teaching-brief generation, and instructional preparation. **Release candidate (final testing)**.
- **Ellison, R.**. *Osmo*: Executive orchestration agent for AI specialist delegation, coordination, and result synthesis within a hierarchical multi-agent system. **Active development**.
- **Ellison, R.**. *Osmo Core*: Shared application infrastructure supporting deployment, communication, and user interaction for the Osmo Bot Family. **Active development**.
- **Ellison, R.**. *Stan*: codeDev governance agent for standards compliance and code quality assurance across defined computational workflows. **Planned development**.
- **Ellison, R.**. *Osmo*$^{+}$: Client liaison chatbot for organizational knowledge, service discovery, and prospective client engagement. **Planned development**.
- **Ellison, R.**. *AudioLMN*: Clinical document generation system for automated audiology letters of medical necessity using extracted patient medical data. **Planned development**.

Intellectual Property

In Deliberation

- **Ellison, R.** and Hooper, S.L. “Neurocognitive Artificial Intelligence System and Method for Mixed-Sound Source Separation and Speaker Diarization”.

In Progress

- Automated Multi-Model Diagnostic Inference System. Pending copyright, Ohio University (Tech ID: 26018). Co-creaters: Drs. Sydney W. Bauer, Fuh-Cherng Jeng, and **Ryan Ellison**.

- Clinician Guided Generative Gramework (CGGF). Pending copyright, Ohio University (Tech ID: 26018). Co-creaters: Drs. Sydney W. Bauer, Fuh-Cherng Jeng, and **Ryan Ellison**.

Issued

- Yakovenko, S., Boots, M., **Ellison, R.**, and Tuntevski, K. (2018, August 28). *US Patent Number: 10,058,077*. "Walkway device for quantitative analysis of gait and its modification in rodents".
- Yakovenko, S., Boots, M., **Ellison, R.**, and Tuntevski, K. (2017, December 12). *US Patent Number: 9,839,200*. "Walkway device for quantitative analysis of gait and its modification in rodents".

Lectures/Talks

- **Ellison, R.**. (2023). Computational neuroscientific approaches to investigate dynamic properties of macro and micro motor systems. Ohio University Dissertation Defense, Athens, OH.
- **Ellison, R.**, Matar, M., Gokoglu, S., Prabhu, R. (2023). Macroscopic model of hypogravity-induced primate brain activity via identification and analysis of a neurovisuomotor performance pathway. NASA GRC LTX Lunch Meeting, Cleveland, OH.
- **Ellison, R.**, Matar, M, Gokoglu, S., and Prabhu, R. (2022). Macroscopic model of hypogravity-induced primate brain activity via identification and analysis of a neurovisuomotor performance pathway. Ohio University NeuroLunch/Neuroscience Seminar, Athens, OH.
- **Ellison, R.**, Matar, M., Gokoglu, S.A., and Prabhu, R.K. (2022). Identification and analysis of visuomotor brain performance pathway (BPP) and macroscopic model of primate brain activity subjected to hypogravity. HRP IWS, Behavioral Medicine Session, Online.
- **Ellison, R.** (2021). Intrinsically fast I_{KCa} decays extremely slowly in a lobster pyloric neuron due to seconds-long $[Ca]_i$ removal dynamics. Ohio University NeuroLunch/Neuroscience Seminar, Athens, OH.
- **Ellison, R.**, Matar, M., Gokoglu, S. (2020). An optimized visuomotor node-and-module model of brain activity when subjected to hypogravity in primates. NASA GRC Central nervous system, Behavioral medicine, and Sensorimotor systems Portfolio Meeting, Cleveland, OH.
- **Ellison, R.**, Matar, M., Gokoglu, S. (2020). A visuomotor node-and-module model of brain activity in primates (continued). NASA GRC Combustion Lunch Meeting, Cleveland, OH.
- **Ellison, R.**, Matar, M., Gokoglu, S. (2020). Optimization of a visuomotor node-and-module model to task-specific brain activity in primates. NASA GRC Internship Meeting, Cleveland, OH.
- **Ellison, R.**, Matar, M., Gokoglu, S. (2020). A visuomotor node-and-module model of brain activity in primates. NASA GRC Combustion Lunch Meeting, Cleveland, OH.
- **Ellison, R.**, Matar, M., Gokoglu, S. (2020). A visuomotor node-and-module model of brain activity in primates. NASA GRC Central nervous system, Behavioral medicine, and Sensorimotor systems Portfolio Meeting, Cleveland, OH.
- **Ellison, R.**, Matar, M., Gokoglu, S. (2020). Neural mass model(s) subjected to space-environment factors using diffuse brain connectome: The connectomics. NASA GRC Internship Meeting, Cleveland, OH.
- **Ellison, R.** (2020). Crustacean nervous system as a CPG model for motor control. NASA GRC Central nervous system, Behavioral medicine, and Sensorimotor systems Team Meeting, Cleveland, OH.
- **Ellison, R.** (2019). IKCa's apparent slowness is due to slow underlying $[Ca]_i$ dynamics: An update. Ohio University NeuroLunch/Neuroscience Seminar, Athens, OH.
- **Ellison, R.** (2019). Using IKCa to determine intracellular Ca^{2+} dynamics: An experimental and computational approach. Ohio University NeuroLunch/Neuroscience Seminar, Athens, OH.
- Bryant, K., Wilson, C., & **Ellison, R.** (2014). Rasmussen's Encephalitis. West Virginia University Neuropsychology Case Conference, Morgantown, WV.

Teaching & Pedagogy

- Lloyds Banking Group Webinar - Introduction to Data Analytics (Instructor; LBG/Data Society/data.ai)
- Skillsoft Bootcamp - Querying with SQL for Clean Scalable Data (Instructor; Skillsoft/Data Society/data.ai)
- Skillsoft Bootcamp - Foundations of Data and AI Literacy for Managers (Instructor; Skillsoft/Data Society/data.ai)
- Lockheed Martin Training - Foundations of Generative AI (Instructor; Lockheed Martin/Data Society/data.ai)
- Lockheed Martin Training - Foundations of Prompt Engineering (Instructor; Lockheed Martin/Data Society/data.ai)
- Skillsoft Webinar - Foundations of Data and AI Literacy (Instructor; Skillsoft/Data Society/data.ai)
- SPS Commerce Training - Foundations of Prompt Engineering (Instructor; SPS/Data Society/data.ai)
- Skillsoft Webinar - Introduction to AI Agents (Instructor; Skillsoft/Data Society/data.ai)
- IQVIA Training - AI Ethics and Responsible AI (Instructor; IQVIA/Data Society/data.ai)
- Altarum Training - Advanced Prompt Engineering (Instructor; Altarum/Data Society/data.ai)
- Altarum Webinar - Foundations of Generative AI and Intro to Prompt Engineering (Instructor; Altarum/Data Society/data.ai)
- GAIT 210 - Prototyping AI Agents using Langflow (Instructor; IQVIA/Data Society/data.ai)
- GAIT 201 - Designing and Implementing AI Agents (Instructor; IQVIA/Data Society/data.ai)
- United States European Command Training - Generative AI & Prompt Engineering (Instructor; EUCOM/Data Society/data.ai)
- AI 220 - Text Generation Lab (Instructor; IQVIA/Data Society/data.ai)
- AI 210 - Transformers and Large Language Models (Instructor; IQVIA/Data Society/data.ai)

- Savola Foods Webinar - AI for HR Professionals (Instructor; Savola Foods/Data Society/data.ai)
- Library of Congress Training - Introduction to Excel (Instructor; LOC-CRS/ Data Society/data.ai)
- PY-STAT 102b - Hypothesis Testing in Python (Instructor; IQVIA/Data Society/data.ai)
- Skillsoft Webinar - Introduction to NLP (Instructor; Skillsoft/Data Society/data.ai)
- PY 202 - Interactive Visualization with Bokeh (Instructor; IQVIA/Data Society/data.ai)
- Skillsoft Bootcamp - Introduction to Neural Networks in Python (Instructor; Skillsoft/Data Society/data.ai)
- Advanced Data Academy (Instructor; CoD/Data Society/data.ai)
  - Intermediate Clustering
  - Intro to NLP
  - Topic Modeling in NLP
  - Clustering in NLP
  - Intro to Neural Networks
  - Foundations of AI Agents
  - Foundations of LangGraph
- Lloyds Banking Group Bootcamp (Instructor; Skillsoft/Data Society/data.ai)
  - Data Analysis
  - Data Management
  - Data Storytelling
  - Data Visualization
- ML 102 - Building and Deploying Models with MLFlow (Instructor; IQVIA/Data Society/data.ai)
- NN Group Data Literacy for Managers Program (Instructor; NN Group/Data Society/data.ai; 14 deployments)
  - Leading with Data Insights
  - Promoting NN's Data Democracy
  - Transforming NN with AI
  - Driving Innovation with Generative AI
- PY 440 - Intermediate Clustering: Hierarchical Clustering and DBSCAN (Instructor; IQVIA/Data Society/data.ai)
- RDS GenAI 111 - Advanced Generative AI Project Lab (Instructor; IQVIA/Data Society/data.ai)
- AI 100 - Intro to Generative AI (Instructor; IQVIA/Data Society/data.ai)
- FSI Seminar - Generative AI Interactive Seminar (Instructor; U.S. DoS-FSI/Data Society/data.ai)
- CV 403 - Generative Adversarial Networks (Instructor; IQVIA/Data Society/data.ai)
- Hearst Webinar - Leveraging Generative AI (Instructor; Hearst/Data Society/data.ai; 68 deployments)
- PY 340 - Introduction to Clustering in Python (Instructor; IQVIA/Data Society/data.ai)
- PY 311 - Logistic Regression in Python (Instructor; IQVIA/Data Society/data.ai)
- AI 101 - Intro to Prompt Engineering (Instructor; IQVIA/Data Society/data.ai)
- RDS GenAI 101 - Intro to Artificial Intelligence (Instructor; IQVIA/Data Society/data.ai)
- Data 102 - Data Literacy for Managers (Instructor; CoD/Data Society/data.ai)
- RDS GenAI 105 - Neural Networks and Deep Learning (Instructor; IQVIA/Data Society/data.ai)
- RDS GenAI 104 - Intro to Neural Networks (Instructor; IQVIA/Data Society/data.ai)
- PY-STAT 102a - Intermediate Statistics (Instructor; IQVIA/Data Society/data.ai)
- DL 401 - Intro to Neural Networks (Instructor; IQVIA/Data Society/data.ai)
- Data 101- Fundamentals of Data Literacy (Instructor; DoE/Data Society/data.ai)
- PY 101 - Intro to Python (Instructor; IQVIA/Data Society/data.ai)
- Skillsoft Webinar - Data Literacy for All (Instructor; Skillsoft/Data Society/data.ai)
- Skillsoft Webinar - Intro to R and Data Wrangling (Instructor; Skillsoft/Data Society/data.ai)
- BIOS 6820 - Advanced Topics in Neuroscience: From Biophysical Neurons to ANN's (GRA; 1 semester)
- PY-STAT 104 - Statistics and Probability Distribution (Instructor; IQVIA/Data Society/data.ai; 2 deployments)
- R 320 - Simple Regression in R (Instructor; IQVIA/Data Society/data.ai)
- PY-STAT 103 - Statistics and Probability (Instructor; IQVIA/Data Society/data.ai)
- R 330 - Intro to Clustering in R (Instructor; IQVIA/Data Society/data.ai)
- Skillsoft Webinar - Intro to Classification in Python (Instructor; Skillsoft/Data Society/data.ai; 4 deployments)
- Data 101 - Fundamental of Data Literacy (Instructor; IQVIA/Data Society/data.ai)
- Skillsoft Webinar - Data Science for Managers (Instructor; Skillsoft/Data Society/data.ai; 2 deployments)
- HHS 107 - Simple Linear Regression in R (TA; HHS CoLab/Data Society/data.ai)
- TEDS 109 - Intro to Visualization in Python (Instructor; BAH-TEDS/Data Society/data.ai)
- HHS 112 - Logistic Regression in R (Instructor/TA; HHS CoLab/Data Society/data.ai)
- HHS 111 - Intro to Classification in R (TA; HHS CoLab/Data Society/data.ai)
- HHS 108 - Intro to Clustering in R (TA; HHS CoLab/Data Society/data.ai)
- R 103/201 - Data Wrangling in R (Instructor; IQVIA/Data Society/data.ai)
- HHS 106 - Intro to Statistics in R (TA; HHS CoLab/Data Society/data.ai; 2 deployments)
- TEDS 104 - Intro to Statistics (TA; BAH-TEDS/Data Society/data.ai)
- TEDS 103 - Data Wrangling in Python (TA; BAH-TEDS/Data Society/data.ai)
- TEDS 102 - Intermediate Python (TA; BAH-TEDS/Data Society/data.ai)
- TEDS 101 - Intro to Python (TA; BAH-TEDS/Data Society/data.ai)

- TEDS 100 - Intro to Data Science (TA; BAH-TEDS/Data Society/data.ai)
- TEDS 123 - Building Scalable Models in Pyspark (TA; BAH-TEDS/Data Society/data.ai)
- PS 313 - Data Literacy for Managers (Instructor; U.S. DoS-FSI/Data Society/data.ai; 9 deployments)
- PS 317 - Fundamentals of Data Literacy (Instructor; U.S. DoS-FSI/Data Society/data.ai; 10 deployments)
- BD 101 - Foundations of Big Data (Instructor; IQVIA/Data Society/data.ai)
- Analytics Applications 202 - Decision Trees (TA; Discover/Data Society/data.ai)
- Data 104 - Data Visualization (TA; Discover/Data Society/data.ai)
- Data 101 - Snowflake and SQL (TA; Discover/Data Society/data.ai)
- PS 316 - Data Visual Design and Storytelling (Instructor; U.S. DoS-FSI/Data Society/data.ai)
- BIOS 3435 - Principles of Physiology Laboratory (GRA; Neurobiology (neural and muscle) section; 5 semesters)
- BIOS 4135/5135 - Human Neuroscience Laboratory/Brain Dissection Lab (Instructor of record; 1 semester)
- BIOS 3450 - Human Physiology (Guest lecturer; Neuroscience section; 1 lecture)
- BIOS 3455 - Human Physiology Laboratory (GTA; 7 semesters)

Students Supervised/Mentored

- Sydney Bauer (Graduate; Summer 2024 - Spring 2026)
  - Dissertation: Bauer, S.W. (2026). Neonatal diagnostic automation utilizing simulated clinical assessments from large language models. [Doctoral dissertation, Ohio University]. OhioLINK Electronic Theses and Dissertations Center.
  - Clinical Externship, WVU Medicine - Department of Otolargyngology (ENT) (05/2026 - Present)
- Hatfield Price (Undergraduate; Fall 2022 - Summer 2024)
  - Project description: Computational and experimental investigation into the regularization of isolated pyloric neurons when subjected to stationary noise via a saddle-node bifurcation in the dynamic system.
- Sydney Bauer (Graduate; Summer 2023)
  - Project description: From-scratch derivation of artificial neural network for simulated neuron activity classification.
- Amanda Carriero (Graduate; Summer 2023)
  - Project description: From-scratch derivation of artificial neural network for simulated neuron activity classification.
- ~10 NASA Interns (Undergraduates; Spring 2020 - Fall 2020)
  - Project description: Acted as a designated peer leader helping a group of NASA interns navigate their NASA research and experience.

Peer Review & Editorial Contributions

Journal of Open Source Software (JOSS)

- Peer reviewer (2019-Present)
  - Reviewed:
    - Tuncel, A., et al. (2024). BlueCelluLab: Biologically Detailed Neural Network Experimentation API. *Journal of Open Source Software*, 9(100), 7026. doi: `https://doi.org/10.21105/joss.07026`
    - Galliano, T., Gay, G., Limozin, L., and Puech, P.-H. (2023). OT_Analysis: a software for rich analysis of force curves when probing living cells with optical tweezers. *Journal of Open Source Software*, 8(90), 4877. doi: `https://doi.org/10.21105/joss.04877`
    - Feldbauer, R., Rattei, T., and Flexer, A. (2020). scikit-hubness: Hubness Reduction and Approximate Neighbor Search. *Journal of Open Source Software*, 5(45), 1957. doi: `https://doi.org/10.21105/joss.01957`
    - Jas, M., et al. (2020). Pyglmnet: Python implementation of elastic-net regularized generalized linear models. *Journal of Open Source Software*, 5(47), 1959. doi: `https://doi.org/10.21105/joss.01959`

Ohio University

- Peer reviewer (3 semesters)
  - Reviewed:
    - Ohio University Original Work Grant

Honors, Awards, Grants, and Recognition

- Data Society Instructor Spotlight Recognition (5x; 2024-2025)
- Ohio University Biological Sciences Teaching Assistantship/Research Assistantship (2016 - 2023)
- Ohio University Biological Sciences Academic Scholarship (2016 - 2021)
- West Virginia University HERF Grant (2014)
- West Virginia Promise Scholarship (2010 - 2014)

- West Virginia Higher Education Grant (2010 - 2012, 2014 - 2015)
- West Virginia University Shenandoah Scholarship (2010)
- Academic Competitiveness Grant (2010)

Media & Public Recognition

- Ohio University College of Arts & Sciences. (2018) *Visiting Professor Yutaka Hirata Reflects on Stay at Ohio University*. All Forum Articles. 5670.
- Ohio University College of Arts & Sciences. (2017). *NEUROLUNCH | Mixed-mode Synchronization Between Two Inhibitory Neurons with Post-inhibitory Rebound*. All Forum Articles. 3697.