Erik C. Johnson

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Education

University of Illinois at Urbana-Champaign *Urbana, IL*

Ph.D. in Electrical and Computer Engineering 2016

Thesis: Minimum-error, energy-constrained source coding by sensory neurons, Advisor: Professor Douglas L. Jones

University of Illinois at Urbana-Champaign *Urbana, IL*

M.S. in Electrical and Computer Engineering 2013

Thesis: Recovery of sparse signals and parameter perturbations from parameterized signal models, Advisor: Professor Douglas L. Jones

University of Illinois at Urbana-Champaign *Urbana, IL*

B.S. in Electrical and Computer Engineering 2008

Relevant Skills

Programming	Python, Matlab, C/C++, Java, ROS, Pytorch
Professional Skills	Project management, open source development, proposal and paper writing, active clearance (SECRET)
Technical Skills	Signal processing, optimization, machine learning algorithm development, computational neuroscience

Selected Publications

[1] Robinson, B. S., Joyce, J., Norman-Tenazas, R., Vallabha, G. K., and Johnson, E. C. (2023). Informing generative replay for continual learning with long-term memory formation in the fruit fly. *bioRxiv*, 2023-01. [Link]

[2] Johnson, E. C., Wilt, M., Rodriguez, L. M., Norman-Tenazas, R., Rivera, C., Drenkow, N., ... and R. Gray-Roncal, W. (2020). Toward a scalable framework for reproducible processing of volumetric, nanoscale neuroimaging datasets. *GigaScience*, 9(12), giaa147. [Link]

[3] Jones, D. L., Johnson, E. C., and Ratnam, R. (2015). A stimulus-dependent spike threshold is an optimal neural coder. *Frontiers in computational neuroscience*, 9, 61.[Link]

Employment History

Senior Research Scientist *Laurel, MD*

Johns Hopkins University Applied Physics Laboratory Oct. 2017 - Present

- Conducted research in neuroscience-inspired AI algorithms and large-scale software tools for neuroscience analysis. Executed research projects in systems, algorithms and software development, both as an individual contributor and task leader. Work resulted in 30+ academic publications, numerous sponsor deliverables, several IP disclosures, and 10+ open-source software repositories.
- Contributed to strategic planning and proposal writing, resulting in competitive funded efforts from new sponsors such as DARPA, NIH, internal JHU entities, and other government agencies.
- From 2020-2023, assisted in supervision of 10-15 staff in the Neuroscience-Inspired AI section. Responsible for staff development, project selection, performance reviews, and administrative tasks.

Research Engineer *Champaign, IL*

Sprite Robotics Jun. 2016 - Oct. 2017

- Conducted novel research into robot path planning in unstructured environments and over surface transitions, resulting in novel algorithmic approaches for high speed-to-weight ratio robots.
- Managed research team of 3-5 engineers in software and hardware projects to support commercial product development.
- Assisted co-founders in research grant proposal development, strategic planning, and investor engagements.

Research Fellow and Teaching Assistant *Champaign, IL*

University of Illinois at Urbana-Champaign Sept. 2008 - May 2016

- NSF IGERT research fellow investigating mathematical models of neural coding in sensory systems, including rat vibrassal system, the human auditory system, and the weakly electric fish electrosense resulting in publications and thesis.
- Development of signal processing tools for sparse signal reconstructions resulting in publications and thesis.
- Teaching assistant for two large, introductory Electrical and Computer Engineering classes, coordinating dozens of undergradute teaching assistants.

Other Activities

2008-2016	**Teaching**: Introduction to Electrical and Computer Engineering, Computer Systems and Programming	*Urbana, IL*
2018-2023	**Teaching**: Biomemetic systems, Introduction to Connectomics, Computational Neuroscience for AI	*Laurel, MD*
2018-2023	**Professional service**: Symposium committee, College Preparation program volunteer, proposal reviewer	*Laurel, MD*