Cole Hurwitz

General Information

Affiliation *Institute for Adaptive and Neural Computation, Informatics, University of Edinburgh.*

Supervisors Dr. Matthias Hennig (principal) and Dr. Arno Onken.

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Website https://colehurwitz.github.io

Education

2017–Present **PhD**, *ANC, Informatics Forum*, University of Edinburgh, UK, Analyzing large-scale extracellular recordings, applying and developing deep generative models, and creating novel computational tools for running and benchmarking spike sorting algorithms.

2013–2017 **BA Logic, Information, and Computation**, *University of Pennsylvania*, Philadelphia, Minor in Mathematics and Computer Science, Summa cum laude.

Publications

- **Cole Hurwitz**, Kai Xu, Akash Srivastava, Alessio Buccino, and Matthias Hennig. *Scalable Spike Source Localization in Extracellular Recordings using Amortized Variational Inference*. Advances in Neural Information Processing Systems 32. 2019
- Matthias Hennig, **Cole Hurwitz**, and Martino Sorbaro. *Scaling Spike Detection and Sorting for Next Generation Electrophysiology*, In Vitro Neuronal Networks - From Culturing Methods to Neuro-Technological Applications. In press. 2019

Preprints

- Alessio Buccino*, **Cole Hurwitz***^{c}, Jeremy Magland, Samuel Garcia, Joshua Siegle, Roger Hurwitz, and Matthias Hennig. *SpikeInterface, a unified framework for spike sorting*. bioRxiv. $*$ - Equal Contribution, ^{c} - Corresponding Author. 2019.
- Jeremy Magland, James Jun, Elizabeth Lovero, **Cole Hurwitz**, Alessio Buccino, Samuel Garcia, Alex Barnett. *SpikeForest: reproducible web-facing ground-truth validation of automated neural spikesorters*. bioRxiv. 2020.

Software

- SpikeInterface: A unified framework for spike sorting. Author.
- Decay Model: Code and examples for the manuscript: Scalable Spike Source Localization in Extracellular Recordings using Amortized Variational Inference. Author.
- HS2: A spike sorting algorithm for dense multielectrode arrays. Real-time speeds for datasets from >4000 electrodes. Developer.

Work Experience

2019–2020 **Research Assistant**, University of Edinburgh, Scotland.
Performed research into deep generative modeling as applied to neural data and built general-purpose software for neuroscience practitioners.

2016–2016 **Teaching Assistant**, University of Pennsylvania, Philadelphia.
Taught recitations and graded assignments/tests for introductory calculus course.

2014–2016 **Athlete Tutor**, University of Pennsylvania, Philadelphia.
Tutored student-athletes in introductory calculus and physics.

Experience

2019 **Summer course**, *MLSS 2019: London*, UCL, Covers topics ranging from optimization and Bayesian inference to deep learning, reinforcement learning and Gaussian processes.

2019 **Organizer**, University of Edinburgh, Edinburgh.
Workshop: "Spike Sorting and Reproducibility for Next Generation Electrophysiology".

2018 **Summer course**, *OCNC: OIST Computational Neuroscience Course*, OIST, Covers methods, neurons, networks, and behavior. Two week project on deep spiking neural networks.

Awards and Honors

PhD NeurIPS travel award (£1400)

PhD OCNC travel award (£500)

BA Thouron Award – Two year UK postgraduate study fellowship

BA Phi Beta Kappa

BA CSCAA Scholar All-American

BA 2016 USA Swimming Olympic Trials Qualifier

BA 2013-2017 Ivy League Championship Swimming Finalist

Programming Languages and Tools

Languages Python, c++

Tools pytorch, pytorch-lightning, scikit-learn, SpikeInterface