Cole Hurwitz

General Information

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

Supervisors Dr Matthias Hennig and Dr Arno Onken.

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Education

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

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

2017–Present **PhD**, *ANC, Informatics Forum*, University of Edinburgh, UK, Development, standardisation and evaluation of spike sorting pipelines for large scale extracellular recordings.

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*. NeurIPS 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.

In preparation

- Alessio Buccino*, **Cole Hurwitz***^{c}, Jeremy Magland, Samuel Garcia, Josh Siegle, Roger Hurwitz, and Matthias Hennig. *SpikeInterface: A unified framework for spike sorting*. $*$ - Equal Contribution, ^{c} - Corresponding Author.
- **Cole Hurwitz**, Klara Gerlei, Matthew Nolan, Alessio Buccino, Jeremy Magland, Samuel Garcia, Klara Gerlei, Matthias Hennig. *Evaluating the choice of spike sorter on functional analyses of neuronal populations*.

Repositories/Organizations

- SpikeInterface: A unified framework for spike sorting. Author.
- VAE Spike Localization: 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.

Experience

Academic

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

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

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

Awards and Honors

PhD OCNC travel grant (£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++, Julia

Tools PyTorch, Keras, Turing (Julia), scikit-learn, scipy, SpikeInterface

Collaborators

Akash Srivastava MIT–IBM Watson AI Lab, Boston, United States

Josh Siegle Allen Institute for Brain Science, Seattle, United States

Jeremy Magland Center for Computational Biology (CCM), Flatiron Institute, New York, United States

Ryan Ly Data Analytics and Visualization, Unversity of Berkeley, United States

Ben Dichter Data Science Consultant, Stanford University, United States

Alessio Paolo Buccino Department of Informatics, University of Oslo, Oslo, Norway

Samuel Garcia Centre de Recherche en Neuroscience de Lyon (CRNL), Lyon, France

Matthew F. Nolan Centre for Discovery Brain Sciences, University of Edinburgh, Edinburgh, Scotland

Klara Gerlei Centre for Discovery Brain Sciences, University of Edinburgh, Edinburgh, Scotland

Kai Xu School of Informatics, University of Edinburgh, Edinburgh, Scotland