Lukas Fischer, PhD

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Passionate scientist with a combined computer science/neuroscience background and over 15 years of experience investigating neural time-series data.

Experience and education

Merck – Senior Specialist 08/2022 – present

- Lead cross-functional team to develop self-supervised models for high-throughput imaging and multi-omics data analysis.
- Implemented data analysis pipelines on high-performance computing and cloud platforms.

Massachusetts Institute of Technology – Postdoc, Research Scientist 2015 – 08/2022

- Conceived and lead projects to identify how cortical neural networks process visual information during navigation utilizing rodent virtual reality systems.
- Implemented GLM and Bayesian models to identify nature and accuracy of information contained in neural network activity.

University of Edinburgh, UK - PhD Neuroscience, Graduate Researcher 2010 – 2015

- Thesis: Development of Virtual Environments to Investigate Path Integration in Mice
- Designed and built virtual reality system for rodent research (http://mousevr.blogspot.com/).
- Developed a rapid prototyping pipeline consisting of 3d modelling, 3d milling and experimental protocol automation to efficiently train mice in virtual environments.

University of Bristol, UK– BSc. Neuroscience, Undergraduate researcher 2007 – 2010

- Developed signal processing algorithms to detect sharp wave-ripple events and spatially tuned neural activity in electrophysiological multichannel recordings.

University of Central Lancashire, UK - BSc. Computer Science, Undergraduate researcher 2006 – 2007

- Designed and implemented software to build multi-compartment models of neurons.

Technical profile

- **Programming**: Python (Numpy/Scipy/Pandas/Scikit-Learn, Matplotlib, Plotly, Jupyter), Pytorch, R, C/C++, Matlab, HDF5, SQL
- **Statistics, ML/AI** Statistical modelling, GLMs, mixed-effects models, supervised/unsupervised deep learning, representation learning
- **Tools and platforms**: Unix, Windows, AWS, Git/Github, Docker, Mbed, Arduino/Teensy, Git
- **Hardware development**: Rapid prototyping (3d printing/3d milling), 3d modelling (Autodesk Inventor), Electronic circuit design (Eagle)

Leadership and organizational skills

Project management: Conceived, planned and executed scientific studies which have been published in peer-reviewed scientific journals.

Mentoring and leadership: Trained and mentored students at various stages. All who have graduated have since joined MD, PhD or MD/PhD programs. Lead cross functional team of up to 5 people.

Organization: Initiated deep learning journal club in industry setting to create idea exchange and networking form in a global organization. Organized and ran seminar series for postgraduate students and postdocs.

Public speaking: Extensive practice from presenting in scientific contexts and as trainer of Bristol University Model United Nations.

Grants & awards

- 1st Place Austrian Marshall Plan Poster Award (2020)
- PhD Scholarship, 4 years, funded by the BBSRC (Biotechnology and Biological Science Research Council) – University of Edinburgh (2010 - 2014)
- Prize for best poster in the category Systems Neuroscience - Edinburgh Neuroscience Day 2014
- Neuroresearchers Fund Training Grant (2013)
- Welcome Trust stipend for summer internship – University College London (2009)

Selected publications and conference proceedings

- Fischer, L., Xu L., Murray K., Harnett M. T. Somatodendritic computation for landmark-based self-localization in retrosplenial cortex. *In preparation.*
- Weihua D.*, Fischer L.*, …, Harnett M. T., Shiqian S., Highly synchronized cortical circuit dynamics mediate spontaneous pain in mice. *J Clin Invest. 2023;133(5):e166408.*
- Fischer, L., Mojica Soto-Albors, R., Buck, F., & Harnett, M. T. (2020). Representation of visual landmarks in retrosplenial cortex. ELife, 9, 811430.
- Pakan, J. M. P.*, Currie, S. P.*, Fischer, L.*, Rochefort, N. L. (2018). The Impact of Visual Cues, Reward, and Motor Feedback on the Representation of Behaviorally Relevant Spatial Locations in Primary Visual Cortex. Cell Reports, 24(10), 2521–2528.

  For a full list of publications please visit Lfischer.org