Andrew **Erskine**

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Summary

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Experience

NeuroGEARS Ltd.

London, United Kingdom

Senior Software Engineer

April 2022 - Present

Software / consulting company developing the Bonsai-Rx language and custom software tools for neuroscience research.

- Improved and extended the popular Bonsai-Rx language for visual reactive programming.
  Built and released Bonsai libraries for sensor interfaces (Tinkerforge), networking (ZeroMQ, Zyre, Lsl), streaming (FFmpeg) and Unity integration.
- Developed Unity VR environments in collaboration with clients in research and industry.
  With partners in clinical and sociological research, developed environments based on real-world city locations that participants can explore in VR while having key biophysical and attention signals monitored (heart-rate, galvanic skin response, eye-tracking, gaze fixation).
- Worked with NeuroGEARS team to provide bespoke software tools to clients including user interfaces and documentation. Used reactive extensions in .NET and asynchronous programming to produce Bonsai-Rx workflows controlling complex neuroscience experiments. Communicated engineering process and requirements to non-technical clients.

Bonsai · C# & .NET · Python · MATLAB · Unity · ZeroMQ · Avalonia · Windows Forms · MAUI · Git

The University of Southern California

Los Angeles, California

Postdoctoral Scholar

May 2018 - April 2022

Investigating somatosensory processing in neural circuits with 2p imaging and 3D optogenetics.

- Reduced manual analysis time by modifying DeepLabCut for Google Cloud, allowing for fast, parallel usage on TB size whisker tracking datasets and speedup of data processing.
- Applied deep neural network models with dimensionality reduction methods to analyze neural population responses in high-dimensional space.
- Designed and deployed machine-learning pipelines to increase analysis throughput in the lab (Google Cloud, Colab).
- Mentored graduate and undergraduate students and provided training in data analysis and programming.
- Employed all-optical techniques to investigate neuronal ensemble recruitment in somatosensory cortex.

Python · MATLAB · Keras · tensorflow · numpy · pandas · jupyter

The Francis Crick Institute / University College London

London, United Kingdom

PhD Student

September 2013 - May 2018

Building automated systems for mouse behavioral studies and investigating the temporal component of olfaction.

- Redesigned high throughput mouse behavior system (AutonoMouse), that was based on an outdated software solution, using Python – including sensor interfaces, experiment control and database.
- Developed several auxiliary libraries that became standard tools: daqface for communicating with National Instruments ADCs and PulseBoy for designing complex digital command patterns.
- Designed a novel odor-delivery device and software package for flexibly generating complex valve patterns with modular design (PulseBoy).

Python · MATLAB · Qt · nidaqmx

Education

University College London

London, United Kingdom

PhD in Neuroscience

2018

- Thesis: Perception and representation of temporally patterned odor stimuli in the mammalian olfactory bulb

University of Manchester

Manchester, United Kingdom

MNeurosci, First Class Honours

2013

- Thesis: Representation of whisker kinematic parameters in the trigeminal ganglion of awake, behaving mice

Publications

2021	**Fast odour dynamics are encoded in the olfactory system and guide behaviour.,** Ackels, T., Erskine, A., Dasgupta, D., Marin, A. C., Warner, T. P. A., Tootoonian, S., Fukunaga, I., Harris, J. J., Schaefer, A. T.	*Nature*
2020	**Behavioral and Neural Bases of Tactile Shape Discrimination Learning in Head-Fixed Mice.,** Kim, J., Erskine, A., Cheung, J. A., Hires, S. A.	*Neuron*
2019	**AutonoMouse: High throughput operant conditioning reveals progressive impairment with graded olfactory bulb lesions.,** Erskine, A., Bus. T., Herb, J. T., Schaefer, A. T.	*PLOS ONE*
2016	**Prediction of primary somatosensory neuron activity during active tactile exploration.,** Campagner, D., Evans, M. H., Bale, M. R., Erskine, A., Petersen, R. S.	*eLife*
2015	**Microsecond-Scale Timing Precision in Rodent Trigeminal Primary Afferents.,** Bale, M. R., Campagner, D., Erskine, A., Petersen, R. S.	*JNeurosci*

Projects

andrewerskine.uk

Portfolio website featuring my personal projects in games, AI, UI and networking

Unity · Blender · DarkRift · HTML, Javascript, CSS · Multiplayer networking · Computer vision