Andrew **Erskine**

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Experience

NeuroGEARS Ltd.

London, United Kingdom

Senior Software Engineer

April 2022 - Present

Software / consulting company developing the Bonsai-Ex 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 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.
- Used 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 lab 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 for flexibly generating complex valve patterns with modular design (PulseBoy).

Python · MATLAB · Qt · nidaqmx

Education

Colorado School of Mines (CSM)

Golden, Colorado

B.S. in Engineering, Mechanical Emphasis – Computer Science and Economics minors

December 2013

- NASA Lunabotics Competition: built a full-size regolith collecting robot and competed with international teams at the Kennedy Space Center.
- FIRST Robotics Competitions: Mentored high school students in engineering princples. Refereed Colorado regional competitions (FRC and FLL).

SolidWorks (FEA) · C++ · Java · Python · Machine shop · Feedback controls · Git · Arduino · MATLAB · LabVIEW

Projects

SingToWho.site

June 2020

A COVID-19 inpired hack to keep people safe and engaged during the pandemic. When washing your hands, who should you sing happy birthday to?

HTML, Javascript, CSS · Google Cloud Storage · Cloudflare DNS · Skeleton CSS

Containerized Server

2015 - Present

Homelab for experimenting with containers, virtualization, and services - with archive-class robust file-integrity protections.

Docker (RancherOS) · ZFS · Traefik · RAID · btrfs · Samba · Mumble · Plex · Borg backup · Beets · NGINX