

Emily Olafson

computational neuroscientist

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Neuroscience PhD candidate adept at analysing and interpreting large datasets, developing predictive models, and applying novel analytical frameworks. Extensive data processing and analysis experience and strong ability to communicate complex ideas and results to a general audience.

Education

B. Sc. Neuroscience

McGill University, Canada
GPA 3.94/4
2015 - 2019

PhD Neuroscience

Weill Cornell Medical College, NY, USA
2019 - present

Skills

R, MATLAB
Python, PyTorch, Sci-kit learn, pandas, numpy, matplotlib, TensorFlow
AWS
Machine learning
Command line
Probability & statistics
GitHub

Extras

Prison Instructor

September 2021 - present
Neuroscience course instructor at Five Points Correctional Facility in Romulus, NY

Machine Learning in Medicine co-organizer

May 2021 - present
Invited speakers to virtual seminar series and ran Twitter, website, and email communications

BrainHack co-organizer

December 2020
Co-organized NYC edition of BrainHack, a data science and neuroscience hackathon

Projects + Publications

Development of a novel imaging biomarker to study brain anatomy

- Conceptualized and implemented a pipeline to extract a novel biomarker from a large, multi-site imaging dataset.
- Used R, MATLAB, and bash on distributed computing platform to extract image intensity.
- Developed algorithms to detect anomalies in signal intensity in processed images.
- Extracted image intensity, performed model fitting, and statistically assessed model parameters related to age, sex, and autism diagnosis.
- Results summarized and published in Cerebral Cortex.

Graph theory analysis of network reorganization after stroke

- Preprocessed raw time series data to generate graph representations of brain activity.
- Applied graph theory algorithms to isolate instances of reorganization.
- Used modelling techniques to relate reorganization and clinical parameters to stroke recovery, published in Neuroimage.

Predicting disability using 3D imaging data

- Predictive modelling of motor disability in large multiple sclerosis imaging dataset using a 3-dimensional convolutional neural network in Keras and TensorFlow.
- Learned representations of brain atrophy predictive of disability and achieved predictive accuracy on par with current methods.

Clustering timeseries data to identify discrete brain states

- Performed k-means clustering of processed time series data to characterize time-varying brain activity into discrete states.
- Programmed calculation of dynamic systems parameters, including optimization procedures to determine model parameterization.
- Applied regression models to identify links between state dynamics and recovery from stroke.

Awards and Certifications

Abstract award Top 3% of abstracts at the Organization for Human Brain Mapping conference.
06/2021

Best Diagnostic Application Artificial Intelligence Health Hackathon for OpenCellAI, blood cancer detection software
02/2020

Graduate Fellowship Award Master's scholarship awarded by the Canadian Institutes of Health Research
05/2019

Scientific and High Performance Computing Summer course run by SciNet including parallel Python, R, and Machine Learning with Python
06/2018