Gerald Pho

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SUMMARY

Aspiring Data Scientist with 12+ years of experience in quantitative neuroscience research, including 4+ years of experience in machine learning. Ph.D. work entailed analyzing 1000s of neural recordings using machine learning models to discover the roles of different brain areas during visual behavior. Current postdoctoral work uses computer vision-based tracking and behavioral analysis to elucidate learning strategies used by the brain.

SKILLS

Machine Learning: classification, regression, feature engineering, data visualization, dimensionality reduction, deep learning for computer vision, reinforcement learning
Statistics: regression, confidence intervals, bootstrapping, nonparametric statistics
Coding: Python (Numpy, Matplotlib, Pandas, scikit-learn, Keras), MATLAB, Git, SQL
Familiar with: R, C, Tensorflow, clustering, NLP, time-series, HMMs, Bayesian nonparametrics

EXPERIENCE

2017 - **Postdoctoral Fellow in Neuroscience,** Harvard University, Cambridge, MA

EDUCATION

2017 **Ph.D. in Neuroscience**, Massachusetts Institute of Technology, Cambridge, MA.
2010 **B.S.E. in Biomedical Engineering**, Case Western Reserve University, Cleveland, OH.

PROJECTS

***Postdoc:* Interpreting role of motor brain areas in learning skilled behaviors**

- Contributed to development (Python & C) of large-scale automated behavioral training system for rats
- Applied deep learning-based computer vision algorithms (Python) to track animal movements from 1000s of hours of video data using Harvard's computing cluster
- Aggregated (SQL) and visualized behavioral data from dozens of rats using dimensionality reduction
- Analyzed evolution of individual behavior patterns with & w/o brain lesion to uncover learning strategies

***PhD Thesis*: Discovery of task-dependent neural representations in different visual brain areas**

- Developed behavioral software (MATLAB) and tasks to probe role of poorly understood brain areas
- Acquired, managed, and analyzed large neural imaging datasets spanning 1000s of neurons
- Used regularized linear regression models, SVM classifiers, and statistics to interpret neural activity
- Discovered multiplexed neural representations in the brain area PPC
- Published findings in *Nature Communications* article: https://www.nature.com/articles/s41467-018-05012-y

***Harvard ML course project*: Automated segmentation of brain lesions from volumetric imaging data**

- Implemented U-Net with data augmentation to predict lesion location and extent from rat brain images
- Jupyter notebook and writeup on Github: https://github.com/gpho

RELEVANT COURSEWORK

Advanced Machine Learning, Data Mining, and Artificial Intelligence (Harvard Extension)
Algorithms; Statistics for Neuroscience Research; Machine Learning (MIT)
Data Structures; Systems and Signals; Statistics for Engineering; Modeling of Biomedical Systems (CWRU)