Darby Losey, Ph.D.

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Summary: Accomplished machine learning expert interested in building statistical tools for signal processing. Proficient in developing algorithms to analyze large and complex datasets. Experienced in conveying technical concepts to a general audience.

Education

Ph.D.	Carnegie Mellon University	Machine Learning / Neural Computation	2017-2023
M.S.	Carnegie Mellon University	Machine Learning Research	2017-2022
B.S.	University of Washington	Computer Science	2012-2016

Work Experience

Machine Learning Research Intern, TDK-Qeexo, Pittsburgh, PA, May 2023 - September 2023

Developed interpretable deep learning methods to enhance transparency of artificial neural networks.

- Refined algorithms to decipher black-box predictions using influence functions and matrix approximation methods.
- Derived convergence bounds for approximation methods, providing accuracy guarantees underscored by detailed proofs.
- Trained convolutional and feedforward neural networks for method validation.
- Built tools for streamlining model debugging and data cleansing workflows by implementing automation processes using explainable A.I.
- Led a series of seminars to train fellow research engineers on the use and application of explainable A.I.

Doctoral Researcher, Carnegie Mellon University, Pittsburgh, PA, August 2017 - May 2023

Leveraged advanced machine learning methodologies to analyze complex patterns within larger neuronal populations, uncovering rules that govern learning. Adapted these algorithms for the training of artificial neural networks.

- Implemented continual deep learning models using PyTorch, with a focus on biological plausibility.
- Modeled the evolution of noisy, high dimensional time series data using reinforcement learning algorithms.
- Led and participated in a deep reinforcement learning journal club and a machine learning journal club.
- Guest lecturer for graduate level classes, focusing on Kalman filters and dimensionality reduction methods. TA for two computational courses.
- Awarded a five-year National Science Foundation Graduate Research Fellowship.
- Research led to a successfully funded National Institutes of Health R01 grant.

Deep Learning Engineer, Neubay, Seattle, WA, April 2016 - August 2017

Implemented deep learning models for the classification of noisy time series data.

- Designed, trained, and evaluated various deep learning models such as autoencoders, recurrent neural networks, and convolutional neural networks for the prediction of cognitive states.
- Attained over 90% accuracy in the real-time classification of a user's mental state by monitoring neural signals.
- Secured angel investment after presenting prototypes to venture capitalists.

Research Assistant, University of Washington, Seattle, WA, March 2013 - June 2016

Implemented software for scientific experiments and conducted data analysis.

- Developed and deployed real-time classification algorithms for high-dimensional, noisy time series data.
- Designed and implemented robust, high-performance software for brain-computer interface experiments.
- Executed comprehensive data analysis on large image-based datasets, utilizing statistical methods and machine learning algorithms to identify key patterns and trends.
- Awards: Honors in Computer Science, Computer Science Outstanding Undergraduate Thesis Award, Mary Gates Foundation Research Scholarship, Washington Research Foundation Innovation Fellowship, North American Computing Research Association Outstanding Researcher (Honorable Mention).
- Published three academic papers and granted a patent.

Knowledge, Skills and Abilities

- **Deep Learning:** deep reinforcement learning, interpretable machine learning, autoencoders, multi-task machine learning, transfer learning, convolutional neural networks, recurrent neural networks, anomaly detection.
- **Machine Learning:** exploratory data analysis and visualization, dimensionality reduction, state estimation, clustering, regression and classification, supervised and unsupervised learning, Bayesian inference, probabilistic graphical modeling, optimization, causal inference, high-dimensional statistics, computational theory.
- **Programming Languages:** Python (10+ years), SQL, C++, C, Java.
- **Libraries:** PyTorch, JAX, TensorFlow, NumPy, Pandas, Scikit-Learn, Matplotlib.
- **Platforms:** CUDA, MLflow, Jupyter, High Performance Computing Cluster, Docker, LaTeX, Linux, Git.

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Personal Website
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