Erik J. Peterson, PhD

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In summary Research leader. Excellent scientist. Thoughtful engineer.

Experience

Phinyx - Providence, RI
Principle Scientist **2024 - Current**
Head of research, focusing on natural language program synthesis and automated programming for scientific computing.

Pasteur Labs - New York, NY
Advanced Projects Lead (final position) **2022 - 2024**
Led advanced projects in causal AI and scientific machine learning, bridging academic research and industrial applications. Spearheaded development of a comprehensive scientific ML library, including neural operators and graph neural networks (>30 networks). Pioneered "simulation intelligence" methods for analog computations in physical systems.

Carnegie Mellon University - Pittsburgh, PA
Research Fellow **2019 - 2022**
Developed mathematical models of curiosity in reinforcement learning and established new theoretical limits for biological computation.

Kernel - Los Angeles, CA
Senior Scientist **2017 - 2018**
Led team developing model for complex spatio-temporal electrical field shaping, achieving 400,000-fold speed-up for real-time use in brain-computer interfaces.

U.C. San Diego - San Diego, CA
Postdoctoral Fellow **2014 - 2017**
Conducted theoretical and computational research on the optimal coding properties of neural oscillations. Co-developed of a python tool to analyze electrophysiological time-series which has found widespread use in the neuroscience community and been downloaded >275,000 times.

Colorado State University - Fort Collins, CO
Graduate Research Assistant **2006 - 2012**

Biosearch Technologies - Novato, CA
Research Assistant II **2004 - 2006**
Optimized high-throughput chemistry for DNA synthesis; developed reporter genes.

Education

Colorado State University (Fort Collins) - Ph.D, Psychology; Masters, Psychology.

California Polytechnic State University (San Luis Obispo, CA) – B.S., Chemistry; B.S., Biochemistry; Minor, Philosophy.

Programming Developed production-ready machine learning models in modern frameworks (jax, torch). Expert scientific programmer (python). Fluent in standard development tools (git, docker, etc).

Press/Talks

Brain's 'Background Noise' May Hold Clues to Persistent Mysteries, *Quanta Magazine*, 2021.
Build Your Own Brainwaves, *Nerd Nite*, Los Angeles, Feb 2018.
In Theory You're Paying Attention, *Ignite*, San Diego, Nov 2016.

Select publications. Total citations: >2,000. h-index: 14.

Peterson EJ & Lavin A, Physical Computing for Materials Acceleration Platforms, *Matter* 5, 3586-3596 (2022).

Lavin A, et al, Simulation Intelligence: Towards a New Generation of Scientific Methods, *arXiv* 2112.03235 (2021).

Donoghue T*, Haller M*, **Peterson EJ***, et al, Parameterizing Neural Power Spectra into Periodic and Aperiodic Components, *Nature Neuroscience* 23 1655-1665 (2020).