Jai Bhagat

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Selected Skills

ML & AI

Dimensionality Reduction
(incl. PCA, t-SNE, SAEs)
Unsupervised Learning
(incl. HDBSCAN, OPTICS)
Supervised Learning
(incl. GLMs, SVMs, Forests)
Deep & Reinforcement Learning
(incl. CNNs, Transformers, MI, RAG
TD, DQNs, P/DPO, RLHF)
Distributed Training
(incl. DDP, FSDP)

Programming Languages

Python (incl. PyTorch, Jax)
Bonsai, C, Rust, CUDA

Software Services

Wandb, Docker, Slurm,
AWS (EC2, ECS, S3), GCP, HF 🤗

Mechatronics

Micro-controllers -computers
(incl. Arduino, R Pi)
Simple PID, KF Control Systems
Ephys Acquisition
CAD & 3d Printing
Laser Cutting

Wet Lab

In-vivo Electrophysiology
Genotyping
Optogenetics
Stereotaxic surgeries
Histology

Selected Awards

Bogue Fellowship 2024
Fondation JFMLCT 2023
UCL AWPO 2022
SWC Public Engagement Fund 2022
SWC Ph. D. Scholarship 2021

Extra Training

MARS Scholar - AI Alignment
ARENA scholar - AI Alignment
Machine Learning Summer School
Extracellular Ephys Acquisition

Education

Ph. D. Computational Neuroscience | University College London 2025
A.S.P. Neuroscience | Massachusetts Institute of Technology 2018
B.A. Neuroscience | Boston University 2015

Selected Professional Experience

Bogue Fellow Research Scientist, Anthropic 2025 Jan – 2025 Mar
San Francisco, CA, USA

Data Scientist, Sainsbury Wellcome Centre 2020 Nov – 2021 Aug
University College London, London, UK

Software Developer, CortexLab & International Brain Lab 2018 Oct – 2020 Aug
University College London, London, UK

Technical Associate I/II, Wilson Lab 2016 Jun – 2018 Jun
Massachusetts Institute of Technology, Cambridge, MA, USA

Selected Publications

Bhagat, Molas, Lindsey. Mechanistic interpretability for neural interpretability: Overcomplete sparse autoencoders find interpretable neural spike signatures corresponding to motor and environmental features. *In Prep*.

Bhagat, et al. Aeon: An open-source platform to study the neural basis of ethological behaviors over naturalistic timescales. *In Prep*.

Banga, Benson, ***Bhagat***, et al. Reproducibility of in-vivo electrophysiological measurements in mice. *Biorxiv* & *In Press* 2023.

Steinmetz, Aydin, Lebedeva, Okun, Pachitariu, ***Bhagat***, et al. Neuropixels 2.0: A high-density probe for stable, long-term brain recordings. *Science* 2021.

Bhagat, et al. Rigbox: An open-source toolbox for probing neurons and behavior. *eNeuro* 2020.

Bhagat, et al. LSTM neural networks for LFP event detection and classification in the rodent hippocampal-cortical network. *MIT BCS Symposium 2018*.

Bhagat, et al. Machine learning techniques to improve analyses of neural spike data. *MIT Intelligence Quest 2018*. [*Press Release*]

Selected Open-Source Projects

nanoGPT: A minimal (nanomal?) Python repository containing code for building, training, and running nanoGPT. *(Sole creator, developer, and maintainer)*

Wall-E-GPT: Python and Arduino code for a GPT-controlled, semi-autonomous rover robot running on a Raspberry Pi. *(Sole creator, developer, and maintainer)*

aeon_mecha: Project Aeon's main Python library for interfacing with acquired experiment data. *(Creator, developer, maintainer: active)*

aeon_experiments: Project Aeon's main Bonsai and C# library for running behavioral neuroscience experiment workflows. *(Developer, maintainer: active)*

ibllib: The International Brain Laboratory's core shared Python libraries for data pipeline management and analysis. *(Developer, maintainer)*

MatchMentor: Football video analysis AI in Python to democratise player training. *(Creator, developer, maintainer)*

Rigbox: A MATLAB and C based toolbox for running behavioral neuroscience experiments and managing data. *(Developer, maintainer)*

J_Clust. A complete, MATLAB spike sorting package. *(Sole creator, developer, and maintainer)*