Saarang Panchavati, Research Scientist

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Summary

I am a PhD candidate in Medical Informatics at UCLA building foundation models for complex biological signals. My work centers on self-supervised learning—particularly JEPA-based architectures—applied to large-scale neural data, with the goal of learning transferable representations that generalize across tasks, cohorts, and recording conditions. I am broadly interested in how these approaches can accelerate scientific discovery across biological data modalities where scale, heterogeneity, and label scarcity are the central challenges. I previously interned with the Brain AI group at Meta FAIR in London, and my work has been published at ICLR, Epilepsia, and ICASSP.

Education

University of California, Los Angeles *Sep 2021 – May 2026 (expected)*
Ph.D. in Medical Informatics
NSF GRFP Fellow
Training in Neurotechnology Translation Fellow

University of California, Berkeley *May 2021*
B.S. in Bioengineering & Electrical Engineering & Computer Science
Sutardja Dai Entrepreneurship Fellowship

Selected Publications

Panchavati, Saarang, U. Panchavati, C. Arnold, and W. Speier (2026). *Laya: A LeJEPA Approach to EEG via Latent Prediction over Reconstruction*. eprint: 2603.16281.

Panchavati, Saarang*, A. Daida*, S. Kanai, S. Oana, H. Ono, M. Izumi, et al. (2026). "Distinct Spectral and Directional Thalamocortical Network Dynamics Define Focal Seizure Evolution". *medRxiv*.

Daida, A., Y. Ding, Y. Zhang, S. Oana, **Panchavati, Saarang**, B. D. Edmonds, et al. (2025). "Fast ripple band high-frequency activity associated with thalamic sleep spindles in pediatric epilepsy". *Clinical Neurophysiology*.

Daida, A., **Panchavati, Saarang**, S. Oana, S. Kanai, Y. Zhang, Y. Ding, et al. (2025). "Evidence of thalamocortical network activation during epileptic spasms: A thalamic stereotactic EEG study". *Epilepsia*.

Panchavati, Saarang, C. Arnold, and W. Speier (2024). "Mentality: A Mamba-based Approach towards Foundation Models for EEG". *The Twelfth International Conference on Learning Representations (ICLR)*.

Panchavati, Saarang, A. Daida, B. Edmonds, M. Miyakoshi, S. Oana, S. S. Ahn, et al. (2024). "Uncovering spatiotemporal dynamics of the corticothalamic network at ictal onset". *Epilepsia* 65.7, pp. 1989–2003.

Parthasarathy, N., J. Soetedjo, **Panchavati, Saarang**, N. Parthasarathy, C. Arnold, N. Pouratian, et al. (2024). "High performance P300 spellers using GPT2 word prediction with cross-subject training". *Brain-Computer Interfaces* 11.4, pp. 210–224.

Panchavati, Saarang, S. Vander Dussen, H. Semwal, A. Ali, J. Chen, H. Li, et al. (2023). "Pretrained transformers for seizure detection". *ICASSP 2023-2023 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. IEEE, pp. 1–2.

Panchavati, Saarang, N. S. Zelin, A. Garikipati, E. Pellegrini, Z. Iqbal, G. Barnes, et al. (2022). "A comparative analysis of machine learning approaches to predict C. difficile infection in hospitalized patients". *American Journal of Infection Control* 50.3, pp. 250–257.

Pellegrini, E., **Panchavati, Saarang**, C. Lam, A. Garikipati, N. Zelin, G. Barnes, et al. (2021). "A Machine Learning Clinical Decision Support Tool For Myocardial Infarction Diagnosis". *Journal of the American College of Cardiology* 77.18_Supplement_1, pp. 653–653.

Mohamadlou, H., **Panchavati, Saarang**, J. Calvert, A. Lynn-Palevsky, S. Le, A. Allen, et al. (2020). "Multicenter validation of a machine-learning algorithm for 48-h all-cause mortality prediction". *Health Informatics J.* 26.3, pp. 1912–1925.

Shen, K., A. Yau, **Panchavati, Saarang**, and M. M. Maharbiz (2020). "An automated system for reactive accelerated aging of implant materials with in-situ testing". *2020 42nd Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC)*. IEEE, pp. 4466–4469.

Find more on Google Scholar

Experience

Medical Informatics PhD Candidate September 2021 – Present
Biomedical AI Research, Los Angeles

- Designing JEPA-style EEG foundation models to learn transferable neural representations for downstream decoding and clinical prediction tasks.
- Designed cross-dataset evaluation suites assessing transfer, noise robustness, and low-label adaptation across heterogeneous clinical cohorts.
- Leading translational research in pediatric epilepsy focused on seizure-network analysis and machine learning based strategies for closed-loop neuromodulation.
- Developed machine learning methods to link EEG-derived features with gait impairment phenotypes in Parkinson's disease.
- Mentored undergraduate researchers to build a real-time motor-imagery BCI pipeline (PyTorch, MNE, BCI2000), culminating in a first-place award at UCLA Bioengineering Research Day.

Research Scientist Intern Mar 2025 - August 2025
Meta FAIR (BrainAI), London

- Conducted research on multi-modal representation learning for neural decoding and encoding in the Brain AI group across diverse data types (neural data, imaging, vision, language).
- Contributed to scalable open-source neural data training and evaluation pipelines in large collaborative codebases; developed benchmarks to assess cross-task and cross-modal transfer

Data Science Intern March 2020 – May 2022
Dascena, Remote

- Evaluated deep learning models for ICU C. difficile prediction, contributing to a peer-reviewed publication.
- Built longitudinal EHR predictive models across multiple clinical indications, resulting in three peer-reviewed publications.
- Developed EHR data-processing pipelines using AWS and SQL to support model development and retrospective analysis.

Undergraduate Researcher January 2018 – May 2020
Maharbiz Lab, Berkeley

- Designed experiments to evaluate neural-implant biocompatibility under accelerated aging conditions.
- Built automated aging experiments using Raspberry Pi, PySerial, and MATLAB, contributing to a conference publication.

Selected Research Projects

EEG Foundation Model 2024–Present

- Developing an EEG foundation model based on LeJEPA that can learn reusable and transferable representations.
- Executed distributed pre-training on 30k hours ($>$ 1B tokens) and over 20K subjects and evaluated on both BCI and clinical tasks to assess cross-task and cross-cohort transfer.
- Contributed to an cross-dataset evaluation suite covering transfer, robustness to noise, and low-label adaptation across research and clinical tasks.

Epilepsy Dynamics and Biomarkers for Closed-Loop Neurostimulation 2023–Present

- Established evidence for thalamic involvement in seizure dynamics in pediatric epilepsy using SEEG spectral and connectivity analyses.
- Characterized thalamocortical interaction patterns during seizures to clarify mechanisms of modulation and termination.
- Investigating biomarker-driven deep learning approaches for identifying adaptive closed-loop thalamic stimulation protocols in pediatric epilepsy.

Skills

Neuroscience	EEG/SEEG preprocessing; spectral and connectivity analysis; neural decoding; brain–computer interfaces; neuroanatomy
Machine Learning	State-space models (Mamba); transformers; self-supervised learning; foundation models; time-series modeling; representation learning
Programming & Tooling	Python; PyTorch; PyTorch Lightning; MNE; scikit-learn; TensorFlow; SQL; Pandas; Git; distributed training (DDP)

Last updated: March 18, 2026