

SABADNOOR SINGH

Sabadnoorsin@umass.edu • Amherst, MA

EDUCATION

University of Massachusetts Amherst | *B.S. in Psychology, Business Studies Certificate*
GPA 4.00 • Dean's List Fall 2025 and Spring 2026 • Chancellor's Award recipient

Aug. 2025–May 2027 (Expected)

RESEARCH EXPERIENCE

McLean Hospital, Harvard Medical School affiliate | *Research Intern*

Belmont, MA | Feb. 2026–Present

- Led a first-author study of 14,021 UK Biobank participants, identifying 269 sleep-associated functional connections; from short to long sleepers, occupancy of one recurring brain state fell from 30.6% to 22.4%, while another rose from 41.0% to 45.0%.
- Expanded a depression-versus-healthy analysis into a parallel replication across three independent cohorts: UK Biobank, the Human Connectome Project young-adult sample, and a clinical major-depressive-disorder cohort from China.
- Designed an independent replication strategy by identifying brain connections that overlapped across two cohorts and validating those candidates in a held-out third cohort, confirming that the convergence was far beyond chance.
- Distinguished reduced statistical power from weaker effects in smaller cohorts, verified robustness across model assumptions, and presented recommendations on cohort and depression-measure comparability.

University of Massachusetts Amherst | *Independent Study in Psychology, PSYCH 396A*

Sep. 2026–Present

- Conduct an independent human–AI interaction study comparing emotional responsiveness in human counseling and AI conversation corpora under the guidance of Professor Lena Warnke.
- Develop a reproducible Python pipeline for conversation standardization, RoBERTa/GoEmotions scoring, linguistic feature extraction, and turn-level emotional mirroring analyses.
- Assess dataset comparability and platform differences with nonparametric tests and effect sizes while refining a counseling-specific comparison arm.

University of California, Davis, Ben-Shalom Lab | *Research Intern*

Davis, CA | Jun.–Aug. 2026

- Evaluated methods for inferring neuronal connectivity from high-density microelectrode array recordings in organoid and mouse models.
- Designed an adaptive, two-stage quality-control framework using channel occupancy and data-derived active-area thresholds.
- Benchmarked more than 10 inference methods against simulated and collaborator-provided ground truth, identifying implementation problems and activity-dependent failure modes.

PEER REVIEWED CONFERENCE PAPER

Singh, S., Zendeirouh, E., Gunn, M., Calhoun, V. D., & Sendi, M. S. E. (2026). Static and dynamic brain connectivity patterns across sleep duration. *IEEE International Workshop on Machine Learning for Signal Processing (MLSP). Proceedings forthcoming in IEEE Xplore.*

POSTER PRESENTATIONS

- **Singh, S., Zendeirouh, E., Gunn, M., Calhoun, V. D., & Sendi, M. S. E. (Sep.–Oct. 2026).** Static and dynamic brain connectivity patterns across sleep duration. IEEE MLSP, Atlanta, GA.
- **Singh, S. (May 2026).** How the brain tracks sleep: A large-scale neuroimaging study. Poster presented at the University of Massachusetts Amherst, Amherst, MA.

SELECTED TECHNICAL PROJECTS

Sports Analytics and Prediction Market Platform

Live

- Built and deployed a basketball analytics system for identifying positive expected-value opportunities in Kalshi markets, with Kelly-based position sizing, order execution, trade tracking, and bankroll controls.

Semantic Search Engine for Sri Guru Granth Sahib

Live

- Built a multilingual retrieval and reranking pipeline with transformer embeddings, source-linked results, and no generative output at query time to keep responses verifiable.

LEADERSHIP

Walnut Sikh Community Center | *Facilities Coordinator*

Walnut, CA | Nov. 2022–Jun. 2025

- Coordinated facilities and logistics for a multi-day retreat serving more than 400 participants, directing volunteer teams, allocating resources, and resolving operational issues under time pressure.

SKILLS

Research methods: experimental design, cross-dataset replication, functional connectivity, neuroimaging, behavioral and text analysis

Statistical analysis: covariate-adjusted GLMs, Pearson correlations, Welch's t, two-proportion z, Mann–Whitney U, Kruskal–Wallis and binomial tests, Benjamini–Hochberg FDR, Storey q-value and Bonferroni corrections, effect sizes, sensitivity analyses

Programming and tools: Python, MATLAB, Git/GitHub, HPC/Slurm, Qualtrics, Excel

Machine learning: transformer-based NLP, RoBERTa/GoEmotions, semantic search, vector search

Languages: English and Punjabi