

Keerthana Manikandan

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Education

Doctor of Philosophy (Ph.D.) in Bioengineering Aug 2020–April 2026 (*Expected*)
University of Pittsburgh *Pittsburgh, PA*
Dissertation: Neurobiology of the cortical resting state investigated with high-resolution tools in monkeys.

Bachelor of Engineering (B.E.) in Biomedical Engineering July 2013–June 2017
Sri Sivasubramaniya Nadar College of Engineering (affiliated to Anna University) *Chennai, India*

Research Experience

Graduate Student Researcher, University of Pittsburgh Aug 2020–April 2026
Advisor: Dr. Omar Gharbawie *Pittsburgh, PA*

- Designed and executed electrophysiological and imaging experiments to investigate the neural mechanisms underlying brain networks.
- Developed and optimized robust parallel-processing algorithms in MATLAB to efficiently pre-process (data cleaning, feature engineering) and store large-scale electrophysiological data.
- Engineered high-performance signal processing pipelines (time-series decomposition, exploratory data analysis) to visualize and analyze electrophysiological data.
- Applied advanced machine learning methods (k-means clustering, principal component analysis, multiple linear regression) for pre-processing and common reference registration of imaging data.
- Utilized advanced statistical modeling with SPSS (mixed-effects ANOVA, model fitting) to conduct multimodal data analysis and extract key neural parameters that govern brain networks.
- Presented research findings at 3+ academic conferences to diverse audiences.

Junior Research Intern, Indian Institute of Science Aug 2018–July 2020
Advisor: Dr. Supratim Ray *Bangalore, India*

- Collected, processed, and analyzed electrophysiological data from 100+ individuals with Alzheimer’s disease and cognitive impairment to identify markers of aging and disease progression.
- Designed and implemented signal processing pipelines (artifact removal, feature identification) in MATLAB, optimizing analysis efficiency and reproducibility.
- Developed and validated novel electrophysiological metrics of aging and disease using statistical modeling.
- Trained 4+ students in the acquisition and analysis of electrophysiological data, equipping them with essential skills to advance their research projects.

Publications & Proceedings

Manikandan, K., Card, N. S., & Gharbawie, O. A. (2025). Neurophysiology of resting state networks in monkeys. *Under prep.*

Kumar, W. S., Manikandan, K., Murty, D. V., Ramesh, R. G., Purokayastha, S., Javali, M., Rao, N. P., & Ray, S. (2022). Stimulus-induced narrowband gamma oscillations are test–retest reliable in human eeg. *Cerebral Cortex Communications*, 3(1).

Murty, D. V., Manikandan, K., Kumar, W. S., Ramesh, R. G., Purokayastha, S., Nagendra, B., Ml, A., Balakrishnan, A., Javali, M., Rao, N. P., et al. (2021). Stimulus-induced gamma rhythms are weaker in human elderly with mild cognitive impairment and alzheimer’s disease. *Elife*, 10.

Murty, D. V., Manikandan, K., Kumar, W. S., Ramesh, R. G., Purokayastha, S., Javali, M., Rao, N. P., & Ray, S. (2020). Gamma oscillations weaken with age in healthy elderly in human eeg. *NeuroImage*, 215.

Ritu, V., Keerthana, M., Geethanjali, B., & Veezhinathan, M. (2017). A functional connectivity based approach to visualize the event related changes in depression through cognitive information processing during working memory tasks. *2017 IEEE 16th International Conference on Cognitive Informatics & Cognitive Computing (ICCI* CC)*, 247–256.

Poster Presentations

Manikandan, K., Card, N. S., & Gharbawie, O. A. (2024). *Neurophysiology of cortical resting state investigated with high resolution tools in monkeys.* [Simian Collective, Pittsburgh].

Manikandan, K., Card, N. S., & Gharbawie, O. A. (2023). *Neurophysiology of cortical resting state investigated with high resolution tools in monkeys.* [Society for Neuroscience, Washington DC].

Teaching Experience

Graduate Teaching Assistant

Aug–Dec 2022

Dynamic systems (BIOE 1255)

Bioengineering

- Led weekly lab sessions for 35 Bioengineering majors and delivered interactive lectures on dynamic systems and control theory.
- Boosted student exam performance by an average of 18% through targeted, concept-focused office hour support.
- Assessed weekly assignments and exams, providing actionable feedback to reinforce core learning objectives.

Graduate Teaching Assistant

Aug–Dec 2021

Signals and Systems (BIOE 1320)

Bioengineering

- Developed lab exercises using MATLAB to model action potentials and demonstrate signal filtering principles.
- Conducted weekly lab sections and held office hours for 64 students, offering support and guidance.
- Evaluated lab assignments and exams and provided detailed feedback to improve comprehension.

Professional Experience

Associate Intern

March 2025–Aug 2025

LifeX

Pittsburgh, PA

- Developed regulatory frameworks for early-stage medtech startups navigating FDA approval pathways.
- Defined feasibility study parameters to assess clinical and market readiness of early-stage sleep apnea device.
- Identified 10+ funding sources to support and commercialize pre-seed startups.

Clinical Application Specialist

July 2017–June 2018

Philips Healthcare

Bangalore, India

- Delivered 50+ clinical demonstrations of diagnostic ultrasound systems.
- Provided clinical training and product support at 10+ medical conferences.

Leadership

Communications Committee

Sep 2024–Dec 2025

Center for Neural Basis of Cognition (CNBC)

University of Pittsburgh & Carnegie Mellon University

- Curated student-run [annual newsletter](#) for the neuroscience community at the University of Pittsburgh and Carnegie Mellon University, highlighting research and community activities.
- Organized a two-part writing workshop to help trainees craft a thought piece for the general audience.

Executive Engagement Manager and Consultant

March 2023–Dec 2025

Fourth River Solutions

Pittsburgh, PA

- Conducted primary and secondary market research, including segmentation, regulatory landscape, and competitive analysis.
- Led scoping, contracting, and client relationship management for pre-seed life science startups.

Executive board member

Jan 2022–July 2024

Allegheny Science Policy and Governance

Pittsburgh, PA

- **Winner** of the 2023 Knowing Neurons NeuroPolicy Competition for work on global mental health diplomacy.
- Completed [2023 Diplomatic Skills Training Program](#) focused on science diplomacy and policy negotiation.
- Managed the creation and promotion of social media content for science policy initiatives.

Fellowships and awards

Wesley C. Pickard Fellowship, Department of Bioengineering 2024–2025
Awarded competitive fellowship covering full stipend for the academic year in recognition of research potential.

Travel award, Center for Neural Basis of Cognition (CNBC) August 2024
Received \$250 travel grant to attend and present a research poster at the Simian Collective conference.

Special Opportunity Fund, Department of Bioengineering June 2024
Awarded \$1,000 to attend the Neuropixels and OpenScope Workshop at the Allen Institute in Seattle.

Certifications

Center for Neural Basis of Cognition (CNBC) Graduate Training Program Aug 2020 - Present
University of Pittsburgh & Carnegie Mellon University *Pittsburgh, PA*

- Completed advanced coursework in systems, cognitive, and computational neuroscience as part of certificate requirements.
- Presented original research to peers during the *Brain Bag* seminar series

Neuropixels and Openscope Workshop June 2024
Allen Institute *Seattle, WA*

- Selected from more than 200 applicants to attend a competitive two-day workshop at the Allen Institute.
- Gained in-depth exposure to large-scale in vivo recording techniques through lab tours and expert-led lectures.
- Received the Special Opportunity Fund award from the Department of Bioengineering to support attendance.

Computational Neuroscience course July 2020
Neuromatch academy *Online*

- Completed an intensive three-week course covering traditional and emerging computational neuroscience tools.
- Applied learning through a hands-on project component using Python during the latter part of the course.
- Studied key topics including machine learning, deep learning, reinforcement learning, dynamical systems, dimensionality reduction, and Bayesian statistics.

Affiliations with Professional Organizations

Society for Neuroscience
Center for Neural Basis of Cognition
Graduate Biomedical Engineering Society
Graduate and Professional Student Government

Service & Outreach

Super Analytics Challenge Jan 2025
University of Pittsburgh *Pittsburgh, PA*
Participated in Super Analytics Challenge to tackle healthcare issues for homeless population in Pittsburgh.

Skills

- Programming & Scripting:** Python, MATLAB, Bash, C++
- Tools, Platforms & Packages:** Jupyter, LabVIEW, GitHub, Adobe (Illustrator, Photoshop), L^AT_EX, MS Office (Word, Excel, PowerPoint), IBM SPSS.

References

- Dr. Omar Gharbawie**, Department of Neurobiology, University of Pittsburgh.
- Dr. Supratim Ray**, Center for Neuroscience, Indian Institute of Science.