

Junda Zhu, Ph.D.

Neuroscientist & Neuroengineer

Los Angeles, CA · junda.zhu@csmc.edu · [Portfolio](#) · [GitHub](#) · [Google Scholar](#) · [LinkedIn](#)

PROFILE

End-to-end neuroscientist and neuroengineer across **human and non-human primate** electrophysiology, behavior, and imaging. Experienced with **acute and chronic implants** and **invasive and non-invasive recording and neuromodulation**. I build the whole pipeline—*study design* → *acquisition (bedside/OR/online)* → *QC* → *decoding/analysis* → *reporting*—and translate results for clinicians, engineers, and scientists. Current work spans **closed-loop and offline** signal processing for cognitive and decision-making paradigms.

Areas of expertise: Human & NHP electrophysiology · Acute & chronic implants · Invasive & non-invasive recording · Neuromodulation workflows · Behavioral task design · Closed-loop & offline analysis · Scientific communication · Project management

IMPACT & CONTRIBUTIONS

- **Full-stack study ownership:** designed from scratch, coded (Python/JS), deployed, recruited, budgeted, and analyzed cognitive/memory/decision-making tasks; collected data from *100+ participants* (patients & healthy controls) across online and in-person settings.
- **Reliable bedside & OR capture:** ongoing project supports ~10 bedside patients (*including two pediatric patients*) and ~5 intra-operative sessions; standardized setup/checklists for stable signal acquisition and smooth sterile-field workflow.
- **Industry collaboration (company name confidential):** beta-tested next-generation *laminar* probes in NHP models (at Vanderbilt) and human intra-operative research (at Cedars/Sinai); provided feedback on signal quality, insertion approach, and drape/sterilization integration.
- **Clinical & regulatory operations:** coordinated IRB submissions/amendments; adhered to GCP/HSR and site SOPs; contributed to site start-up readiness and onboarding/training documentation.
- **Reproducible analysis:** standardized analysis repositories and runbooks; *open-sourced a utility library on GitHub* to reduce reruns and speed iteration.
- **Mentorship & training:** trained undergraduate and graduate students at Vanderbilt and Cedars/Sinai; authored quick-start guides/SOPs for onboarding.
- **Communication & grant enablement:** produced figures/briefings for multi-disciplinary teams; contributed preliminary datasets that supported successful NIH R01 applications.
- **Team player & strong IC:** collaborative across surgery, neurology, and engineering while independently executing complex projects with solid project management practices.

SKILLS & TOOLS

Clinical Ops	IRB/ISO 14155, GCP/HSR, site start/Up & training, AE reporting
Neural Data & ML	Python, MATLAB, R (10+ yrs); pandas, scikit/learn, PyTorch; SVM/LDA/RNN; dPCA/GAM/Mixed/efects
Acquisition & Hardware	Blackrock NeuroPort/CerePlex; Neuralynx System; National Instruments DAQ; Open Ephys; Neuropixels; Brainsight Vet (neuronavigation/robotic guidance); headstages & amplifiers; eye/Tracking
Experiment Design	Psychtoolbox, PsychoPy/Pavlovia; Cedrus control module; Arduino; eye/Tracking
Neuroimaging	fMRI/DTI; AFNI, FreeSurfer; longitudinal analysis

EXPERIENCE

Postdoctoral Scientist, Neurosurgery — Cedars/Sinai Medical Center, Los Angeles, CA — 2024–Present

Scope: Human intracranial research (bedside/OR), neural/behavioral task design, analysis pipelines, cross/team communication.

- *Built from scratch task design:* built and deployed a cognitive control task (unpublished) for bedside/OR and online use; integrated Cedrus box; bilingual prompts and quick practice flow; used across ~10 bedside patients and ~5 intra/op sessions (including two pediatric patients); >100 online participants.
- *External collaboration:* beta/tested next/generation *laminar* probes in NHP (Vanderbilt) and human intra/op operative settings (Cedars/Sinai); delivered usability and signal/quality feedback (insertion angle, impedance/QC checks, sterile/field workflow).
- *Ops & documentation:* authored SOPs/checklists and pre/op drills; coordinated IRB submissions and amendments; prepared concise data briefs for clinical and engineering teams.
- *Pipelines:* standardized Python/MATLAB analysis; standardized repositories and runbooks; built a utility package and open/sourced it on GitHub to support reuse and reproducibility.
- *Stack:* Python (NumPy/Pandas/scikit/learn, PyTorch), MATLAB/R; Blackrock/TDT; Git/CI; PsychoPy/Psychtoolbox; Pavlovia/Prolific.

Postdoctoral Fellow, Biomedical Engineering — Vanderbilt University — 2024

Scope: Transition bridge from Ph.D. to postdoc; collaboration across clinical and engineering teams; research translation and readiness for human electrophysiology.

- *Outcomes:* programmed and operated Brainsight Vet neuronavigation/robotic guidance system for nonhuman primate procedures; planned targets/trajectories and integrated with task workflows.

Ph.D. Candidate, Neuroscience — Vanderbilt University — 2021–2024

Scope: Large/scale neurophysiology; adolescent development of working memory; longitudinal imaging; statistical modeling; decoding & dynamical systems; student mentorship.

- *Outcomes:* first/author and collaborative publications (Nature Neuroscience 2025; iScience 2024; J Neurophysiol 2023); reproducible pipelines; mentored undergrad/grad students on analysis and experiment design.

Ph.D. Candidate, Neuroscience — Wake Forest University School of Medicine — 2018–2021

Research Assistant, Neurobiology — Southern University of Science and Technology — 2015–2018

EDUCATION & CERTIFICATIONS

- **Ph.D., Neuroscience** — Vanderbilt University, 2024
- **B.S., Bioinformatics** — Southern University of Science and Technology, 2018
- **CITI Program** — GCP (2024–2027); Biomedical Investigators & Key Personnel/HSR (2024–2034); Conflicts of Interest (2024–2028)
- **HIPAA** — HIPAA Privacy & Security Training (current)
- **Professional** — Google Project Management (course)

PUBLICATIONS

- Mozumder, R., Wang, Z., Dang, W., **Zhu, J.**, Hammond, B.M., Machado, A., et al. *Asynchronous firing and off states in working memory maintenance*. Cell Reports, 45(1), 2026.
- **Zhu, J.**, Smith, C.R., Garin, C.M., Zhou, X.M., Calabro, F., Luna, B., et al. *Trajectories of Response Inhibition Development in Adolescence*. bioRxiv, 2026.
- Jaffe, R., Dang, W., Gao, T., **Zhu, J.**, Constantinidis, C. *Prefrontal Mechanisms of Rule Learning*. bioRxiv, 2026.
- **Zhu, J.**, Garin, C.M., Qi, X.L., Machado, A., Wang, Z., Hamed, S.B., Stanford, T.R., Salinas, E., Constantinidis, C. *Longitudinal measures of monkey brain structure and activity through adolescence predict cognitive maturation*. Nature Neuroscience, 2025.
- McKeon, S.D., Petrie, D., Sydnor, V.J., Wang, Z., **Zhu, J.**, Famalette, A., Foran, W., et al. *Cross-species evidence for the refinement of intrinsic neural timescales supporting executive system maturation through adolescence*. bioRxiv, 2025.
- Machado, A., **Zhu, J.**, Garin, C.M., McPhail, M., Anderson, A., Calabro, F., Luna, B., et al. *White matter microstructure and working memory of macaques in adolescence*. Journal of Vision, 2024.
- **Zhu, J.**, Zhou, X.M., Constantinidis, C., Salinas, E., Stanford, T.R. *Parallel signatures of cognitive maturation in primate antisaccade performance and prefrontal activity*. iScience, 2024.
- Alldritt, S., Ramirez, J.S.B., de Wael, R.V., Bethlehem, R., Seidlitz, J., Wang, Z., **Zhu, J.**, et al. *Brain Charts for the Rhesus Macaque Lifespan*. bioRxiv, 2024.
- Wang, W., van Dammen, L., Moody, S.N., Kiesner, J., Neiderhiser, J.M., Dismukes, A., **Zhu, J.**, Constantinidis, C., Shirtcliff, E.A. *The validation of estradiol extraction and analysis from hair*. OSF Preprints, 2020.
- **Zhu, J.**, Constantinidis, C. *Neural circuits and processes of working memory*. Encyclopedia of the Human Brain, 2nd ed., 2024.
- **Zhu, J.**, Hammond, B.M., Zhou, X.M., Constantinidis, C. *Laminar pattern of adolescent development changes in working memory neuronal activity*. Journal of Neurophysiology, 2023.
- Han, P., She, Y., Yang, Z., Zhuang, M., Wang, Q., Luo, X., Yin, C., **Zhu, J.**, et al. *Cbln1 regulates axon growth and guidance in multiple neural regions*. PLOS Biology, 2022.
- **Zhu, J.**, Lodish, A.W., Silenzi, L., Kattner, E.A., Myatt, G.D., Gu, D., Robertson, M., et al. *Working Memory and Prefrontal Neural Activity of Macaques in Early Adolescence*. Journal of Vision, 2021.
- Liu, Y.H., **Zhu, J.**, Constantinidis, C., Zhou, X. *Emergence of prefrontal neuron maturation properties by training recurrent neural networks in cognitive tasks*. iScience, 2021.
- Zhuang, M., Li, X., **Zhu, J.**, Zhang, J., Niu, F., Liang, F., Chen, M., Li, D., Han, P., Ji, S.J. *The m6A reader YTHDF1 regulates axon guidance through translational control of Robo3.1 expression*. Nucleic Acids Research, 2019.
- Yu, J., Chen, M., Huang, H., **Zhu, J.**, Song, H., Park, J., Ji, S.J. *Dynamic m6A modification regulates local translation of mRNA in axons*. Nucleic Acids Research, 2018.

EDITORIAL & PROFESSIONAL ROLES

- **Editor** — The Innovation Life journal — 2024–Present
- **Editorial Board Member** — American Journal of Biomedical and Life Sciences — 2024–Present
- **Reviewer** — Imaging Neuroscience — 2026–Present
- **Reviewer** — Experimental Brain Research — 2026–Present
- **Reviewer** — Frontiers in Computational Neuroscience — 2024–Present
- **Reviewer** — Journal of Neurophysiology — 2020–Present
- **Member** — Society for Neuroscience — 2021–Present

PRESENTATIONS & POSTERS

- Maturation trajectories of cognitive and prefrontal activity in adolescence — Johns Hopkins University, Jan 2024.
- Working memory development in adolescent macaques — Working Memory Symposium 2023, May 2023.
- Neuronal activity changes in the macaque prefrontal cortex during adolescence — Society for Neuroscience, Nov 2022.
- Structural brain changes of the macaque brain during adolescence — Society for Neuroscience, Nov 2022.
- Precision of visuospatial working memory reports in adolescent monkeys — Society for Neuroscience, Nov 2022.
- NMDA dependence of serial biases in working memory — CRCNS PI Meeting, Oct 2022.
- Prefrontal neural changes in early adolescence related to working memory — Society for Neuroscience, Nov 2021.
- Working memory and prefrontal neural activity of macaques in early adolescence — Vision Sciences Society, May 2021.