Xingyu (Brian) Zhou

https://www.linkedin.com/in/xingyu-brian-zhou | xzhou25@stanford.edu

EDUCATION

Stanford University — Stanford, California

Ph.D. in Bioengineering — September 2025 – Present (expected 2032)

Johns Hopkins University — Baltimore, Maryland

B.S. in Biomedical Engineering and Electrical Engineering, Cumulative GPA: 4.0/4.0 — August 2021 – May 2025

HONORS & AWARDS

- The JHU Whiting School of Engineering Student Initiatives Fund for Spring 2024, $1,700 — February 2024
- The Catalyst Award by the Hopkins Office for Undergraduate Research (HOUR), $1,000 — November 2023
- The Provost's Undergraduate Research Award Summer Cycle (Summer PURA), $6,000 — June 2023
- Member of the Omicron Delta Kappa leadership honor society (top 5% of JHU undergraduates) — Summer 2024 – Present
- Member of the Tau Beta Pi engineering honor society (top 12.5% of the JHU class of 2025) — Fall 2023 – Present

RESEARCH EXPERIENCE

Stanford University, Departments of Neurosurgery and Ophthalmology — Stanford, California

Ph.D. Student at the lab of Professor E.J. Chichilnisky (rotation student, Winter 2026) — January 2026 – Present

- Member of the Stanford Artificial Retina Project, building an implant to record and stimulate single retinal neurons.
  - Develop and maintain the implant control software, ensuring simultaneous neural recording and stimulation, as well as develop implant assembly and test protocols in collaboration with SLAC and TU Delft.
  - Co-advised by Prof. Tsachy Weissman: Developed custom template-based spike detection for the implant's compressed data readout, which requires only a minute of recording to recover 101 of 110 neurons found in a one-hour long session.

Stanford University, Department of Chemical Engineering — Stanford, California

Ph.D. Rotation Student at the lab of Professor Zhenan Bao — September 2025 – December 2025

- Spearheaded the design and verification of a neuromorphic mechanoreceptor CMOS circuit for a stretchable organic electronic skin.
  - Co-established a custom simulation protocol in Cadence Virtuoso by integrating measured organic transistor characteristics to improve model accuracy.
  - Optimized the circuit topology to ensure robust functionality across 8,947 combinations of design parameter choices, successfully refining the initial design proposals.
  - Co-developed a machine learning framework (Neural Networks + Bayesian Optimization) to automate the prediction of ideal circuit parameters based on target output signal features.

Johns Hopkins University, Department of Electrical and Computer Engineering — Baltimore, Maryland

Undergraduate Researcher at the lab of Professor Ralph Etienne-Cummings — September 2024 – July 2025

- Supported the circuit-level implementation of a neuromorphic correlator array chip, enabling real-time temporal correlation computation between pairs of input neural spike trains.

- Extended the signal integration duration by 2-4× through Miller effect-based capacitor augmentation, overcoming inherent size limitations in the prototype design.

The Johns Hopkins University School of Medicine Baltimore, Maryland

Undergraduate Researcher at the labs of Professor Richard Huganir and Professor Patrick Kanold May 2022 – October 2024

- Investigated the dynamics of AMPA receptor subunits in mice using rapid synaptic-resolution whole-brain light sheet fluorescence microscopy (LSFM).
  - Identified a distinct Gria2-expressing neuron population in the piriform cortex exhibiting developmental modulations.
  - Implemented an image processing pipeline for terabytes of LSFM data, focusing on parallel computing strategies.
  - Optimized the protocol of brain clearing for rapid whole mouse brain LSFM imaging up to synaptic resolution.

Johns Hopkins Undergraduate Brain-Computer Interface Society (JHUBCIS) Baltimore, Maryland

Project Lead, advised by Professor Sridevi Sarma and Dr. Lucas Buccafusca August 2022 – August 2024

- Spearheaded the development of an electromyography (EMG) and steady-state visually evoked potential (SSVEP) based hybrid brain-computer interface (BCI), enabling individuals with severe motor disabilities to operate a telepresence robot.
  - Developed the hardware and firmware of the hybrid BCI, ensuring high-quality neural data collection.
  - The system achieves decoding accuracies of over 76% for EMG and 98% for SSVEP.

Medtronic Boxborough, Massachusetts

Electrical Engineering Intern June 2024 – August 2024

- Contributed to the electrical hardware development for the next-generation O-arm, a portable intraoperative 2D/3D X-ray medical imaging system for various procedures including spine, cranial, and orthopedics.
- Repaired and upgraded the software for parsing circuit bills of materials, enabling the derating of more than 150 components per circuit board automatically, streamlining and futureproofing the design verification process.
- Developed test protocols to assess the performance of the X-ray detector panel and the supercapacitor assembly for O-arm prototypes, ensuring the reliability of these components.

RESEARCH CONFERENCE PRESENTATIONS

- **Zhou, X.**, Wang, D., Tinana, A., et al. (October 2024). *An Intuitive and High Accuracy EEG-EMG Hybrid Brain Machine Interface for Telepresence Robot Control.* Poster presentation at the Society for Neuroscience 2024 Conference, Chicago, Illinois, United States.
- Choi, J., **Zhou, X.**, Kwon, K., Kanold, P., Huganir, R. (April 2024). *Light-Sheet Imaging of Whole-Brain AMPA Receptor Distribution in Wild-Type and SynGAP Knock-out Mice.* Poster presentation at the 2024 Mid-Atlantic Research Day, Baltimore, Maryland, United States.

SKILLS

- **Electrical Engineering**: analog integrated circuit design (Cadence Virtuoso), FPGA/VHDL programming (Xilinx Vivado), microcontroller programming (PlatformIO, Arduino), circuit analysis (LTSpice), PCB design (KiCad, Altium Designer)
- **Programming**: Python, Rogue/PyDM (FPGA acquisition GUI)
- **Computer-Aided Design**: Creo Parametric, Autodesk Fusion 360
- **Wet Laboratory**: retina dissection, MEA recording, light sheet fluorescence microscopy, tissue clearing, tissue cryosectioning, mouse stereotaxic surgery, PCR protocol optimization, genetic engineering (SnapGene, Benchling).