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Yunnuo (Noah) Zhang

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EDUCATION

Master of Science in Computer Science, *Georgia Institute of Technology* — Aug 2024 — Present
thread in Machine Learning

Bachelor of Science in Computer Science, *Georgia Institute of Technology* — Aug 2020 — May 2024
thread in Info-network/Intelligence, GPA 3.94/4.0

RESEARCH EXPERIENCE

Research Assistant — June 2024 — Present
BrainGate — *Atlanta, GA*

- Working with **Dr. Chethan Pandarinath** on advanced intra-cortical brain-computer interfaces (iBCI) focusing on enhancing user interaction and computational modeling.
- Contributed to the development of a multifunctional iBCI system capable of simultaneous cursor control and language decoding, utilizing neural signals from the human precentral gyrus.
- Engineered a text-entry extension for the platform, designed for conducting closed-loop experiments. Integrated deep network models using a tech stack comprising React, Redis, and Docker to improve real-time data processing and user interface responsiveness.

Professional Research Assistant — May 2023 — Present
*LiLab @ **Michigan State University*** — *East Lansing, MI*

- Worked with **Dr. Jinxing Li** on pioneering research in soft bio-electronics, brain-computer interfaces, and soft robotics, focusing on innovative applications and integration techniques.
- Developed PCB designs using KiCAD and Altium Designer for SoC Bluetooth communication systems aimed at enhancing front-end electrophysiological signal collection.
- Led the design and fabrication of micro-needles and PEDOT: PSS-based stretchable electrodes, coupled with INTAN-RHD2164 boards. Conducted comprehensive data analysis to assess performance and reliability.

Research Assistant — Jan 2021 — Present
*Contextual Computing Group @ **Georgia Tech*** — *Atlanta, GA*

- Worked with **Dr. Thad Starner** on wearable EEG-based Brain-Computer Interface prototypes for alternative text entry.
- Worked on collecting Steady-State Visually Evoked Potential (SSVEP) and Auditory Steady-State Response (ASSR) signals with customized dry electrodes, applied machine learning algorithms including Generalized Linear Model(GLM), Canonical Component Analysis(CCA) and Hidden Markov Model(HMM) for signal classification.
- Worked on building customized dry active EEG electrodes with Driving Right leg(DgRL) and Tripolar Concentric Ring Electrodes (TCRE) with KiCAD PCB prototyping, conducted impedance level evaluation on different batches of amplifiers.
- Poster works won the 2022 President Undergraduate Research Award(PURA) at Georgia Tech.

Research Assistant — Jan 2021 — Present
*BrainLab @ **Georgia Tech*** — *Atlanta, GA*

- Worked with **Dr. Melody Jackson** on designing novel, mobile-friendly, and non-invasive brain-computer interface modalities.
- Investigated on preprocessing of fMRI and fNIRS data. Applied pre-processing techniques including Principle Component Analysis (PCA) and Independent Component Analysis (ICA) for dimensionality reduction, whitening, and denoising using MATLAB and Python MNE Library.
- Engineered a customized fNIRS wearable cap design with Fusion to enhance user comfort and usability, focusing on ergonomic integration and practical application in real-world scenarios.

Summer Camp Research Assistant   Jun 2018 — August 2018
Bao Group @ Stanford University   *Palo Alto, CA*

- Worked with **Dr. Jinxing Li** on detecting neurotransmitter/dopamine levels using electrochemical sensing techniques.
- Utilized Fast-Scan Cyclic Voltammetry (FSCV) to derive voltammograms and process them in MATLAB, achieving automated graph generation and adjustment via LabVIEW MathScript.
- Designed soft robots using SolidWorks, and developed an ESP32-based interface for humidity detection. Integrated real-time data transmission capabilities using ESP8266 and Pyserial, enhancing the functionality and responsiveness of soft robotic systems.

INDUSTRY EXPERIENCE

Data Science Intern   May 2022 — Aug 2022
AI Camp @ NLP Software Team   *Palo Alto, CA*

- Led teams of five in a startup to do quick iterations on full-stack video transcript summarizing Chrome add-on.
- Pre-processed web-scraped dataset with nltk, deployed the model to an interactive Google Chrome add-on with Flask and Bootstrap.
- Designed and conducted user experience research on the final product including A/B testing and usability testing, and visualized the user study report with Plotly and Matplotlib.

PUBLICATIONS

[Under Review]

- *Vittorio Mottini, Charlie Meilinger, Liuxi Xing, Jiaqi Wang, Yi Xing, Abdallah Daha, Kalyn VanWormer, Jack Darbonne, Yunnuo Zhang, Isabella Rodrigues, Juhua Wang, Joshua Labbe, Michael Ngatio, Paulina Bies, Zhengxu Tang, Kevin Mozel, Calvin Xiang Chen, and Jinxing Li.* **Intrinsically Stretchable HD-sEMG Array for Inclusive Biomedical Interfaces** Nature

[In Preparation]

- *(**equal contribution**) Zhengxu Tang*, Yunnuo Zhang*, Abdallah Daha, Vittorio Mottini, Liuxi Xing, and Jinxing Li.* **Stretchable Electromagnetic Actuators for Underwater Soft Robots.** in IEEE International Conference on Robotics and Automation (ICRA) (2025)
- *Yuhui Zhao, Yunnuo Zhang, Kiavosh Peynabard, Vyja Bernard, Thad Starner, and Melody Jackson.* **Towards SSVEP-based High-speed Brain-Computer Interface Outside the Lab Environment.**
- *Na Dai, Yunnuo Zhang, Abdallah Daha, and Jinxing Li.* **Predicting Neurochemical Concentration Using A Contrastive Learning based Representation on Convolutional Neural Network .**

HONORS & AWARDS

President Undergraduate Research Award, Georgia Tech
Dean's List, Georgia Tech
Faculty Honors, Georgia Tech
SDG Technical Innovation Award, Tsinghua University Shenzhen Institute
Software Design 3rd Place Award, ByteDance & Georgia Tech Shenzhen Institute

TEACHING

CS 6601: Artificial Intelligence   Aug 2024 — Jan 2025
Georgia Tech   *Atlanta, GA*

- Served as a Teaching Assistant for the co-registered CS6601 **Artificial Intelligence** course under the guidance of **Dr. Thomas Ploetz**.
- Contributed to the design and delivery of course materials tailored to enhance learning experiences for graduate students.

CS 3600/6601: Artificial Intelligence   Jan 2023 — May 2023
Georgia Tech   *Atlanta, GA*

- Served as a Teaching Assistant for the co-registered CS3600/6601 **Artificial Intelligence** course under the guidance of **Dr. Thad Starner**.
- Played a key role in designing and facilitating course materials, effectively instructing over 1500 undergraduate and graduate students.

Natural Language Processing   May 2022 — Aug 2022
AI Camp Inc.   *Palo Alto, CA*

- Worked as a data science instructor for natural language processing introductory courses.
- Held sessions that tutored over 100 students and worked as project supervisor for high school attendants.

PRESENTATIONS

Posters and Demos

- *Yuhui Zhao, Yunnuo Zhang, Kiavosh Peynabard, Vyja Bernard, Thad Starner, and Melody Jackson.* **Towards a Practical, Reliable, High-speed Brain-Computer Interface Outside the Lab Environment.** in GVU Center Spring Research Showcase. April 2023
- *Yunnuo Zhang, Yuhui Zhao, Saurab Sirpurkar, Thad Starner, and Melody Jackson.* **Towards SSVEP-based EEG Handless Interaction in Non-Lab Settings with Driving Right Leg and Active Electrodes: a Proof-of-Concept Study.** in 16th Annual Undergraduate Research Spring Symposium, April 2022
- *Xin Hu, Yuzhi Li, Yunnuo Zhang, Huahua Tian, Jiajia Li, Yiqi Min, Ruobin Wang, and Di Song.* **Sleepal: a fNIRS-based Sleep Tracking System for CBTI Insomnia Treatment.** in 2020 SDG Open Hack at Tsinghua University and University De Geneve, November 2020

SKILLS

Programming Language	Python, JavaScript, C++, C, MATLAB, SQL, CSS, HTML
Software	Linux, KiCAD, Altium Designer, Git, Docker, Maven, Gradle, OpenCV
Frameworks/Tools	Android SDK, PyTorch, Redis, Scikit-Learn, MNE, MATLAB PsychToolbox, Kaldi, HTK, React, Flutter, AWS Lambda Linux, Node.js
Prototyping	Embedded design, PCB design, laser cutting, 3D printing, laser cutting