Zhanqi (Victoria) Zhang

314-295-0396 | zhz091@ucsd.edu | https://zhanqizhang66.github.io

EDUCATION

- **Ph.D. Computer Science**, University of California San Diego **Expected June 2026**
- **M.S. Computer Science**, Washington University in St. Louis, **GPA: 4.0/4.0** **August 2020 – May 2021**
- **B.S. Computer Science,** Washington University in St. Louis, **GPA: 3.95/4.0** **August 2016 – May 2020**
- **B.S. Electrical Engineering,** Washington University in St. Louis, **GPA: 3.95/4.0** **August 2016 – May 2020**

RESEARCH EXPERIENCES

Graduate Research Student **September 2021 – Present**

Co-a*dvised by Dr. Gal Mishne and Dr. Mikio Aoi, University of California San Diego*

- Analyzed a **large human behavior video dataset** of freely moving bipolar human participants for clinical assessment.
- Applied **unsupervised quantification** and **machine learning** approaches such as VAEs, clustering methods, **latent representation learning**, dimensionality reduction, and **computer vision** on bipolar behavior classification and increases the accuracy by 12%.
- Led a team to design a novel **transformer-based NLP generative model** that outperforms baseline image captioning models and leading to up to 63% higher scores on benchmarks.

Research Assistant **December 2019 – August 2021**

Advised by Dr. Carlos Ponce, Washington University School of Medicine, Harvard Medical School

- Developed human-subject and deep-learning based **semantic segmentation** pipelines in MATLAB and PyTorch.
- Discovered principles of information encoding in primate ventral streams with macaque monkey electrophysiological data.
- Designed methods to compare information encoding principles in primate brains and in **learning-based neural networks** models (**ViTs, CNNs, RNNs**) of the ventral stream.
- Collaborated with lab members to design optimizers for in silico experiments that use latent space computing.

Research Assistant **May 2020 – August 2021**

Advised by Dr. Bhooma Aravamuthan, Washington University School of Medicine

- Created an open field animal **pose tracking classification model** to classify mouse behaviors such as rearing with 83% accuracy.
- Designed a clinically feasible video-based dystonia identification model using **deep learning**.

Research Undergraduate **August 2019 – May 2020**

Advised by Dr. Shantanu Chakrabartty, Washington University School of Engineering

- Assisted lab members in building machine learning models to visualize high-dimensional sonic data.
- Utilized neural networks to recognize and classify hand-drawn shape images with 98% accuracy.

WORK EXPERIENCES

Meta **June 2024 – September 2024**

Research Scientist Intern

- Developed EMG-CV **multi-modality representation learning** model for hand recognition with neural input wristbands and glasses.
- Initiated **cross-functional collaborations** and implemented backbones with a 20% increase in joint representation alignment.
- Developed **contextualized EMG-decoding** tasks, achieving gesture accuracy of 99.6% during training in real-world testing.
- Delivered a breakthrough in hand **pose estimation** by reducing decoding error to 4 degrees, enhancing decoding precision.

CONFERENCES PRESENTATIONS

- **Zhang, Z**., Chou, C., Rosberg, H., Perry, W., Young, J., Minassian, A., Mishne, G., & Aoi, M. (2024). Unsupervised quantification and classification of free-moving human behavior in euthymic. *Computational and Systems Neuroscience (COSYNE)*
- **Zhang, Z**., Yang, Y., Sheehan, T., Chou, C., Rosberg, H., Perry, W., Young, J., Minassian, A., Mishne, G., & Aoi, M. (2023). Semi-supervised quantification and interpretation of undirected human behavior. *Computational and Systems Neuroscience (COSYNE)*
- **Zhang, Z**., Rosberg, H., Perry, W., Young, J., Minassian, A., Mishne, G., & Aoi, M. (2022). Unsupervised quantification of undirected human behavior for bipolar disorder analysis. *IEEE Brain Discovery Neurotechnology Workshop (Spotlight)– Brain Mind Body Cognitive Engineering for Health and Wellness*
- **Zhang, Z**., Rosberg, H., Perry, W., Young, J., Minassian, A., Mishne, G., & Aoi, M. (2022). Unsupervised quantification of undirected human behavior for bipolar disorder analysis. *Society for Neuroscience Conference*
- **Zhang, Z**., Hartmann, T. S., Livingstone, M. S., Born, R. T., & Ponce, C. R. (2022). Animal-feature Encoding in Macaque Brain and in Artificial Networks. *Society for Neuroscience Conference*
- **Zhang, Z**., Ponce, C. R. (2022). Do you see what I see? Representations in brains and neural networks. Brain-Score and Beyond: Confronting Brain-like ANNs with Neuroscientific Data. *Computational and Systems Neuroscience (COSYNE) Workshops.*
- **Zhang, Z**., Hartmann, T. S., Livingstone, M. S., Born, R. T., & Ponce, C. R. (2021). The Macaque Ventral Stream Shows a Hierarchical Structure for Animal-feature Encoding. *Society for Neuroscience Conference.*
- **Zhang, Z**., Hartmann, T. S., Livingstone, M. S., Born, R. T., & Ponce, C. R. (2021). A Hierarchical Structure for Animal-feature Encoding in The Macaque Ventral Stream. *Bernstein Conference.*

SELECTED PUBLICATIONS

- **Zhang, Z**., Yang, Y., Sheehan, T., Chou, C., Rosberg, H., Perry, W., Young, J., Minassian, A., Mishne, G., & Aoi, M. (2024) (*medRxiv*) Semi-supervised quantification and interpretation of undirected human behavior.
- **Zhang, Z**., Hartmann, T. S., Livingstone, M. S., Born, R. T., & Ponce, C. R. (2024) (*bioRxiv*). Heatmaps Reveal Encoding of Animal Features Across the Ventral Stream.
- Rosberg, H., Miranda, A., Holloway, B. M., **Zhang, Z**., Peek, E., Sharp, R., Geyer, M., Young, J., & Perry, W., Minassian, A. (2024). *(in review).* Quantifying Exploratory Behavior in the Human Behavioral Pattern Monitor Using Automated Video Tracking.
- Raut, R.V., Rosenthal, Z. P., Wang, X., Miao, H., **Zhang, Z.**, Lee, J., Raichle M. E., Bauer, A.Q., Brunton, S. L., Brunton, B.W., and Kutz J. N. (2023) (*bioRxiv*) Arousal dynamics mirror spatiotemporal brain dynamics.
- **Zhang, Z.** (2021). Translating Convolutional Neural Networks Approach to the Ventral Pathway. *Washington University in St. Louis McKelvey School of Engineering Department of Computer Science Master Thesis Dissertation.* https://openscholarship.wustl.edu/eng_etds/574/.
- **Zhang, Z.**, Miao, H., & Liao, X. (2020). Shape Recognition in Ultrasound with Deep Learning. *Washington University in St. Louis McKelvey School of Engineering Department of Electrical and Systems Engineering Undergraduate Capstone Thesis.*

HONORS AND FELLOWSHIPS

- **COSYNE Travel Grants**, *University of California San Diego* **February 2024**
- **Shenoy Research Mentor Fellowship in Neuroscience (SURFiN)**, *University of California San Diego* **February 2022**
- **Halıcıoğlu Data Science Institute PhD Fellowship**, *University of California San Diego* **March 2021**
- **Dean's Selected PhD Fellowship**, *Washington University in St. Louis* **October 2019**
- **Summa Cum Laude** (two degrees), *Washington University in St. Louis* **May 2020**
- **Dean's List** (all semesters), *Washington University in St. Louis* **September 2016 – May 2020**
- **Emerging Voices Writing Award**, *Washington University in St. Louis* **April 2017**
- **Tau Beta Pi Engineering Honor Society** (president), *Washington University in St. Louis* **October 2018 – August 2021**
- **Lambda Sigma Honor Society**, *Washington University in St. Louis* **August 2017 – May 2018**

MENTORING EXPERIENCES

Mentor, *Simons Foundation* **September 1, 2022 – Present**

- Offering the mentee a collaborative role in research by analyzing data, co-authoring articles and identifying supplemental projects.
- Providing advice for strategies for handling difficult work situations, finding resources, and suggestions for balancing work and life.
- Advocating for the mentee's success by protecting research time, providing exposure to opportunities, and recognizing talents.

TEACHING EXPERIENCES

Teaching Assistant – Unsuervsied Learning, *University of California San Diego* **September 2024 – December 2024**

- Assist in teaching topics such as descriptive statistics, clustering, singular value decomposition, spectral embedding, probability distributions, density estimation, graphical models, sparse coding, autoencoders, and self-supervised learning.
- Focused on explaining statistical and algorithmic characteristics, and addressing practical issues in data-driven modeling.

Teaching Assistant – Machine Learning, *Washington University McKelvey School of Engineering* **August 2018 – May 2021**

- Instructed in machine learning, circuits, algorithms, and engineering math courses and received high ratings from course evaluations.
- Supported students via weekly office hours and grading lab reports and homework assignments.

Engineering Tutor - *Washington University McKelvey School of Engineering* **August 2018 – May 2020**

- Organized weekly lesson plans for students in physic course and received high reviews in Engineering Student Services.
- Mentored 5 students each semester and provided professional resources and research opportunities.

OUTREACH

CSE DEI, *University of California San Diego* **December 2022 – Present**

- Actively engaged in discussions promoting diversity, equity, and inclusion and hold weekly DEI office hours to answer questions.
- Contributed to conversations aimed at improving representation, creating inclusive academic environments, and addressing challenges faced by underrepresented groups in computer science..

Grocery Delivery Driver - *Fit and Food Connection; St. Louis Housing Authority; Kindness Groceries* **April 2020 – September 2021**

- Delivered groceries weekly from Fields Foods and Save-A-Lot program to 15-20 families in St. Louis affected by COVID-19.
- Prepared and delivered meals bi-weekly from Fit and Food Connection program to senior households affected by COVID-19.

SKILLS

- **Programming**: Python, PyTorch, Distributed Data Parallel (DDP), CUDA, C/C++, Java, JavaScript, Jupyter, MATLAB
- **Machine Learning**: Deep Learning (CNNs, RNN/LSTMs, VAEs, Transformer, LLMs), Self-supervised Learning, Muti-modality Representation Learning, Transfer Learning, Computer Vision (CV), Data Visualization, Statistical Inference and Modeling, Signal Processing, Optimization, Generative Models, Large-scale Data Pipelines
- **Engineering**: Control System, CAD, Solidworks, Circuits, Signals and Systems, Robotics