

Zhanqi (Victoria) Zhang

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EDUCATION

Ph.D. Computer Science, University of California San Diego

M.S. Computer Science, Washington University in St. Louis, **GPA: 4.0/4.0**

B.S. Computer Science, Washington University in St. Louis, **GPA: 3.95/4.0**

B.S. Electrical Engineering, Washington University in St. Louis, **GPA: 3.95/4.0**

Expected June 2026

August 2020 – May 2021

August 2016 – May 2020

August 2016 – May 2020

RESEARCH EXPERIENCES

Graduate Research Student

September 2021 – Present

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

- Analyzing and processing a video dataset of freely-moving bipolar human participants for clinical assessment and analysis.
- Designing unsupervised quantification of undirected human behavior methods in PyTorch using machine learning approaches such as VAEs, clustering methods, latent representation learning, dimensionality reduction, and computer vision.
- Lead a team to design a novel transformer-based NLP model that outperforms baseline image captioning models and generated interpretable descriptions for subtle human behaviors.

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 Python for the lab.
- Discovered principles of information encoding in primate ventral streams with macaque monkey electrophysiological data.
- Designed a quantitative approach to compare information encoding principles in primate brains and more than 20 learning-based neural networks models of the ventral stream such as convolutional neural networks, and vision transformers.
- 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 Aravamathan, Washington University School of Medicine

- Created an open field animal pose tracking framework to classify mouse behaviors such as rearing with 82.78% 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.

CONFERENCES PRESENTATIONS

Zhang, Z., Yang, Y., Sheehan, T., Chou, C., Rosberg, H., Perry, W., Young, J., Minassian, A., Mishne, G., & Aoi, M. (2022). Semi-supervised quantification and interpretation of undirected human behavior. *Computational and Systems Neuroscience (COSYNE) (in submission)*

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*.

PUBLICATIONS

Zhang, Z., Yang, Y., Sheehan, T., Chou, C., Rosberg, H., Perry, W., Young, J., Minassian, A., Mishne, G., & Aoi, M. (in prep). Semi-supervised quantification and interpretation of undirected human behavior.

Zhang, Z., Hartmann, T. S., Livingstone, M. S., Born, R. T., & Ponce, C. R. (in prep). The Encoding of Animal Features as an Organizing Principle of The Ventral Stream.

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

Halcioğlu Data Science Institute PhD Fellowship , <i>University of California San Diego</i>	March 2021
Dean's Selected PhD Fellowship , <i>Washington University in St. Louis</i>	October 2019
Summa Cum Laude (two degrees), <i>Washington University in St. Louis</i>	May 2020
Dean's List (all semesters), <i>Washington University in St. Louis</i>	Sept 2016 – May 2020
Emerging Voices Writing Award , <i>Washington University in St. Louis</i>	April 2017
Tau Beta Pi Engineering Honor Society (president), <i>Washington University in St. Louis</i>	October 2018 – August 2021
Lambda Sigma Honor Society , <i>Washington University in St. Louis</i>	August 2017 – May 2018

MENTORING EXPERIENCES

Mentor, *Simons Collaboration on the Global Brain Undergraduate Research Fellowship Program* **September 1, 2022 - June 30, 2023**

- Direct teaching of academic competencies and norms, including academic values, history of the discipline, and conflict of interest.
- 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.
- Offering encouragement by conveying positive regard, providing moral and emotional support, and giving positive feedback.

TEACHING EXPERIENCES

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

- Instructed around 30 students 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 to assist with homework and received high reviews in Engineering Student Services.
- Mentored 5 students each semester and provided professional resources and research opportunities.
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VOLUNTEERING EXPERIENCES

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

- **Language:** Fluent in English and Chinese.
- **Programming:** Python, MATLAB, PyTorch, Tensorflow, C/C++, Java, JavaScript
- **Machine Learning skills:** Deep Learning, Computer Vision, Unsupervised Learning, Statistical Inference, Signal and Image Processing, Optimization, Graph Model, Manifold Learning