

Victoria Zhang

Machine Learning Research Scientist

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EDUCATION

- **Ph.D. Computer Science**, University of California San Diego, GPA: 3.96/4.0
- **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 2026
August 2020 – May 2021
August 2016 – May 2020
August 2016 – May 2020

WORK EXPERIENCE

Meta

June 2025 – September 2025

Research Scientist Intern

- Developed a **multimodal-to-language** model that decodes wrist EMG and IMU signals into text and contributed to its production deployment for the [Meta Neural Band](#), featured in a [live demo](#) by Mark Zuckerberg at [Meta Connect 2025](#).
- Enabled robust handwriting decoding under motion for the Meta Neural Band through signal processing, robustness training, and diffusion-based data augmentation trained on 100K+ users, improving accuracy by 5% while preserving the 8.7M model, and ~70 ms on-device latency.

Meta

June 2024 – September 2024

Research Scientist Intern

- Developed a **CLIP-style** Transformer-based **multimodal foundation model** with contrastive learning that aligns wrist EMG and egocentric vision, pretraining across hardware platforms, users, and hand-understanding tasks.
- Demonstrated that representations learned from multi-user, multi-device EMG–vision data generalize across downstream hand-understanding tasks, achieving 99.6% [microgesture](#) classification accuracy and <4° joint-angle estimation error.

University of California San Diego

September 2021 – Present

Graduate Student Researcher | advised by Dr. Gal Mishne, Dr. Mikio Aoi

- Identified the *Position Curse*, revealing **position-based retrieval** as a second fundamental retrieval bottleneck in LLMs alongside content-based retrieval; **open-sourced** the first benchmark for position-based retrieval and demonstrated improved positional retrieval and code understanding through targeted **post-training** (SFT, LoRA).
- Developed a **real-time speech decoding** method using LLM (DPO, SFT) and **adversarial domain adaptation**, improving cross-session test-time brain-computer interface (BCI) decoding accuracy by 65% absolute.
- Designed a hierarchical framework that preserves multi-scale semantic information across embedding dimensions, enabling **efficient retrieval** and vector **search** systems, enabling flexible **accuracy–latency tradeoffs**.
- Designed an unsupervised **user–environment interaction learning** framework for large-scale human bipolar behavior **videos** and developed interpretable behavioral metrics, improving bipolar disorder detection accuracy by 45.9%.

Washington University in St. Louis, Harvard Medical School

December 2019 – August 2021

Research Assistant | advised by Dr. Carlos Ponce

- Developed **CV alignment methods** to compare visual representation structures in neural network models (ViTs, CNNs, RNNs) and in biological vision models.

SELECTED PUBLICATIONS

- Zhang, Z. et al. (2026) (in review) [The Position Curse: LLMs Struggle to Locate the Last Few Items in a List.](#)
- Zhang, Z. et al. (2026) (preprint) Neural Embedding Representation for Multiscale Clustering.
- Zhang, Z. et al. (2026) (UAI) [ALIGN: Adversarial Learning for Generalizable Speech Neuroprosthesis.](#)
- Zhang, Z. et al. (2025) (NeurIPS Workshops) [BEHAVE: Behavioral ethology for human assessment via variational encoding.](#)
- Raut, R., ..., Zhang, Z., et al. (2025) (Nature) [Arousal as a universal embedding for spatiotemporal brain dynamics.](#)
- Zhang, Z., et al. (2025) (Science Advances). [Brain feature maps reveal progressive animal-feature representations in the ventral stream.](#)
- Rosberg, H., ...Zhang, Z., et al. (2025). (Methods in Psychology). [Quantifying exploratory behavior in the human behavioral pattern monitor using automated video tracking.](#)
- Zhang, Z. et al. (2024) (in review) [Characterizing behavioral dynamics in bipolar disorder with computational ethology.](#)

SKILLS

- **Programming:** Python, PyTorch, Distributed Data Parallel (DDP), CUDA, C/C++
- **Machine Learning:** LLMs (post-training: SFT, RL, DPO, fine-tuning), deep learning (CNNs, Transformers, VAEs), generative AI, multimodality (text, image, speech) foundation models, transfer learning, LLMs optimization, computer vision (CV), automatic speech recognition (ASR), NLP, signal processing, large-scale distributed pipelines (Kubernetes).
- **Leadership:** Technical Leadership, Cross-functional Collaboration, Research-to-production, 0-1 Projects, Rapid Learning