YUANJIA (SCOTT), YANG

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GitHub | Google Scholar

EDUCATION AND TRAINING

Ph.D. Student | ***Neuroscience*** Sept 2025 – Present
UC San Diego | Talmo Pereira Lab, Salk Institute for Biological Studies

- **Research Focus:** Computational Neuroscience | Neuromechanical Modeling | Deep Reinforcement Learning
- **Funding:** NIH BRAIN U01 (1U01NS136507)

Master of Science | ***Computer Science and Engineering - Artificial Intelligence*** Sept 2023 – Mar 2025
UC San Diego

- **Thesis:** VNL-Ray: Biomechanically Realistic Virtual Rodent Behavior and Task Learning via Deep Reinforcement Learning

Bachelor of Science | ***Majors: Data Science & Cognitive Science*** Sept 2019 – Mar 2023
UC San Diego | GPA: 3.94/4 | *Magna Cum Laude* | *Provosts Honor*

PUBLICATIONS

MIMIC-MJX: Neuromechanical Emulation of Animal Behavior Nov 2025
C.Y. Zhang*, **Y. Yang***, A. Sirbu, et al. | *Under Review at Nature Methods*

Massively Parallel Imitation Learning of Mouse Forelimb Musculoskeletal Reaching Dynamics 2025
E. Leonardis, A. Nagamori, A. Thanawalla, **Y. Yang**, et al. | *NeurIPS Workshop Paper*

VNL-Ray: Biomechanically Realistic Virtual Rodent Behavior and Task Learning Mar 2025
Y. Yang | *Master's Thesis, UC San Diego*

CONFERENCES AND PRESENTATIONS

MIMIC-MJX: Neuromechanical imitation of animal behavior enables flexible models of embodied control Mar 2026
Cosyne 2026 | *Poster Presentation*

Musculoskeletal Imitation Learning: Physics-Aware Constraints Promote Naturalistic Muscle Activity Mar 2026
Cosyne 2026 | *Poster Presentation*

VNL-Playground: Fast and Biologically Realistic Virtual Environment for Simulating Animal Behavior Nov 2025
Society for Neuroscience (SfN) Annual Meeting | *Poster Presentation*

Examining the impact of biomechanical actuation on neural representations for embodied control Mar 2025
Cosyne 2025 | *Poster Presentation*

The impact of biomechanical actuators on neural embodied control Mar 2024
Cosyne 2024 | *Poster Presentation*

RESEARCH EXPERIENCE

Graduate Research Assistant Sept 2023 – Present
Talmo Pereira Lab | Salk Institute for Biological Studies

- **Skills:** GPU-Accelerated Simulation via *JAX/MuJoCo-MJX*, Distributed Training via *Ray*, Deep Reinforcement Learning, Imitation Learning.
- Developing neuromechanical simulation frameworks for studying biological motor control in virtual animals with biomechanically realistic body models, bridging reinforcement learning, biomechanics, and neuroscience.
- Built distributed training systems for large-scale physics simulations, enabling vision-guided, task-driven RL for virtual rodents. Designed transfer learning approaches from kinematic replay to task-driven behavior.

Teaching & Mentorship

Teaching Assistant

Department of Cognitive Science | Halıcıoğlu Data Science Institute — UC San Diego

- **COGS188 - Reinforcement Learning** - Spring 24 | **COGS 118B - Unsupervised Machine Learning** - Winter 23
  COGS118A - Supervised Machine Learning - Spring 23, Winter 23, Spring 22
  COGS108 - Data Science in Practice - Fall 24, Fall 23, Spring 23, Winter 22
  DSC30 - Data Structure & Algorithm - Winter 22, Fall 21, Summer 21, Spring 21
  COGS18 - Introduction to Python - Winter 21 | **DSC10 - Principle of Data Science** - Summer 21
- **Contribution:** Designed lectures slides and programming and conceptual assignments. Actively engaged with students through guest lecturing, office hours, and grading.
- **Feedback:** Consistently received positive feedback from students and high marks on professor's evaluation forms.

Technical Skills

Programming: Python, JAX, JavaScript, R, MATLAB, Java, SQL, LaTeX
ML/RL Frameworks: TensorFlow, PyTorch, Stable-Baselines3, Brax
Simulation & Physics: MuJoCo, MuJoCo-MJX, STAC-MJX
Infrastructure: Ray (distributed computing), GPU/TPU computing, Docker, Git/GitHub
Data & Visualization: NumPy, SciPy, Pandas, Matplotlib, Scikit-learn

Honors and Awards

Magna Cum Laude — Mar 2023
UC San Diego

UC Scholars — Summer 2022
Summer Research Scholarship awarded for excellent undergraduate research