Yuchen Zhang

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EDUCATION

Carnegie Mellon University — Pittsburgh, PA
- *Ph.D. in Robotics* — *Aug. 2025 – Present*
  Master of Science in Robotics; GPA: 4.03/4.3 — *Aug. 2023 – Dec. 2025*

- **University of California - San Diego** — San Diego, CA
  Bachelor of Science in Electrical Engineering; GPA: 3.975/4.0, Summa Cum Laude — *Sep. 2019 – Jun. 2023*

SKILLS

- **Programming Language**: Python, C++, C, CUDA, MATLAB, Java
- **Hardware**: Altium Designer, STM32, Solidworks, Motor Controller Design, 3D printing, Arduino
- **Robotics/AI**: Model Quant & Deploy, ROS1/2, OpenCV, PyTorch+Distributed Training, IsaacGym, PyBullet

PUBLICATIONS

- **Zhang, Y.**, Keetha, N., Lyu, C., Jhamb, B., Chen, Y., Qiu, Y., . . . Wang, W. (2025). UFM: A Simple Path towards Unified Dense Correspondence with Flow. Advances in Neural Information Processing Systems (NeurIPS). Retrieved from https://arxiv.org/abs/2506.09278

- Imai, C., Zhang, M., **Zhang, Y.**, Kierebinski, M., Yang, R., Qin, Y., & Wang, X. (2021). Vision-Guided Quadrupedal Locomotion in the Wild with Multi-Modal Delay Randomization. *2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS).*

RESEARCH EXPERIENCE

- **AirLab** — Pittsburgh, PA
  Graduate Researcher — *Oct 2023 - Present*
  - Led the UniFlowMatch(UFM) project, trained model that achieved SoTA on optical flow and dense wide-baseline matching by assembled 11 datasets. Published in NeurIPS 2025.
  - Optimized UFM and deployed it on Orin AGX as visual odometry frontend.
  - Co-developed UniCeption, a modular multi-view perception library, now used by 3 lab projects.
  - Developed Multi-View Tracking Annotator with YOLO and SAM2, handling occlusion between multiple targets with minimal human intervention.

- **Existential Robotics Laboratory** — San Diego, CA
  Undergraduate Research Intern — *Jun 2022 - Jun.2023*
  - Developed code for photometric calibrating stereo cameras and evaluated its performance with Vicon motion capture system: reduced close-loop error by 12%.
  - Refactored ROS C++ code structure onboard the drone for modularity and assembling tasks into mission.

- **Wang Lab** — San Diego, CA
  Summer Research Intern — *Jan.2021 - Jun.2022*
  - Conducted sim2real transfer of a quadrupedal policy onto real hardware, resolved unmodeled effect of the RealSense camera.
  - Developed python code to simultaneously execute policy and record experiment data.
  - Conducted real-world experiments against baseline, work resulted into publication at IROS2022.

PROJECT EXPERIENCE

- **Field-Oriented BLDC Motor Controller**: A single channel Field-Oriented Control (FOC) motor controller based on STM32. Achieved 2kHz current loop bandwidth.
- **PCB Quadcopter**: Designed and manufactured PCB quadcopter, implemented sensor fusion for attitude and height, achieved stable flight enough to consume entire battery life
- **Reinforcement learning for quadruped robot using Isaac Gym**: Proposed network structure to output and merge actions of different abstraction levels, achieved better dashing performance on quadruped locomotion.
- **Mini Relational Database**: Created a mini relational database in C++ that contains indexing and caching, supports sql-like command including "CREATE", "SELECT", "JOIN".

LEADERSHIP

- **Software & Electronics Lead**, FIRST Robotics Team 5449/12527 - Beijing, China   **2012-2019**