Jianhan Ma

📞 +1 619-458-2556 ✉ mjianhan@gmail.com ⬡ Kingspenguin 🌐 Personal Page

Education

University of California, San Diego	**Sep. 2022 – Mar. 2024**
M.S. in Electrical and Computer Engineering	*La Jolla, CA, United States*

Zhejiang University	**Aug. 2017 – Jun. 2021**
B.E. in Electrical Engineering	*Hangzhou, China*

University of Illinois at Urbana-Champaign	**Aug. 2017 – Jun. 2021**
B.S. in Electrical Engineering	*Champaign, IL, United States*

Publication

* denotes equal contribution

Generalized Animal Imitator: Agile Locomotion with Versatile Motion Prior
Ruihan Yang, Zhuoqun Chen*,**Jianhan Ma***, Chongyi Zheng*, Yiyu Chen, Quan Nguyen, Xiaolong Wang*

- **CoRL 2024**
- Workshop on Towards Reliable and Deployable Learning-Based Robotic Systems, **CoRL 2023 Workshop Best Paper Award**

Experience

Wang Lab, UCSD	**Oct. 2022 – Jun. 2024**
Graduate Student Researcher, Advisor: Prof. Xiaolong Wang	*La Jolla, CA, United States*

- Engineered an advanced learning-based control system for quadruped robots within the IsaacGym simulation environment. Successfully implemented and tested the system on a Unitree A1 robot, achieving a diverse range of dynamic locomotion skills. This single policy enabled the robot to perform complex maneuvers such as jumping, cantering, and executing backflips, demonstrating versatility and robustness in robotic motion control.
- Trained the low-level policy by integrating multiple motion priors, enhancing its adaptability and performance. Customized the reward parameters within the policy gradient framework to optimize the policy's effectiveness across all motion priors, ensuring peak performance in executing complex maneuvers.
- Significantly narrowed the simulation-to-real gap in robotic systems by meticulously optimizing the physical model parameters in the URDF file and fine-tuning the dynamic settings of the Unitree A1 robot within IsaacGym. This enhancement led to a more accurate representation of real-world physics, thus improving the reliability and applicability of simulation results in practical robotics scenarios
- Crafted and implemented a sophisticated codebase for the real-time deployment of high-level control policies on the Unitree A1 robot. This system integrated specific low-level skills derived from motion priors, enabling the robot to accurately execute complex commands (such as running at a designated speed, turning, or jumping over obstacles) issued through a remote controller. This development not only showcased the robot's advanced maneuvering capabilities but also demonstrated the seamless integration of high-level decision-making with low-level motor skills in robotic systems.

AI4H Lab, Zhejiang University	**Oct. 2021 – May 2022**
Undergraduate Research Assistant, Advisor: Prof. Zuozhu Liu	*Haining, China*

- Executed an innovative self-supervised representation learning strategy to enhance the accuracy of semantic segmentation in Cone-Beam Computed Tomography (CBCT) datasets. This approach significantly improved the precision of image analysis, facilitating more accurate and reliable interpretations in medical imaging.
- Established, trained, and evaluated a custom-adapted pixel-level contrastive learning pipeline, specifically tailored for large-scale, unlabeled Cone-Beam Computed Tomography (CBCT) datasets. This pipeline was rigorously tested on a dataset comprising 123,904 unlabeled CBCT images from 400 patients. It achieved an impressive average Intersection over Union (IoU) of 91.33% for tooth labeling in a subsequent transfer learning process using only 500 labeled CBCT images. This significant reduction in the need for labeled data marks a major step forward in reducing manual effort in both clinical and industrial CBCT applications

IRVC Lab, Zhejiang University	**Jan. 2021 – May 2021**
Senior Design, Advisor: Prof. Liangjing Yang	*Haining, China*

- Engineered a sophisticated Augmented Reality (AR) auxiliary system designed to accurately track and tag tumor locations in real-time. This system was adeptly integrated with the vision system of an endoscope mounted on an OpenManipulator-X robot arm. It effectively displayed the pinpointed tumor locations directly onto the endoscope's visual feed, enhancing precision and guidance during medical procedures.

- Accomplished a significant reduction in operative errors by precisely aligning Unity's virtual scene, which represented the patient's tumor, with the real-time visual feed captured by an endoscope controlled by a robotic arm. This innovative alignment technique provided a crucial solution for assisting doctors in accurately locating tumors within a patient's body. It effectively reduced the risk of surgical accidents due to misjudgment, thereby enhancing the safety and reliability of medical procedures.

Selected Projects

Robotic Table Sorting System | *Python, C++, V-Rep*   **May 2020**
- Developed a comprehensive robotic system integrating a UR5 robot arm with advanced sensory equipment, including a radar, a vision sensor, and a proximity sensor. This system was expertly designed to detect and categorize various objects placed on a table. Its sophisticated detection capabilities enabled precise object identification, followed by efficient sorting based on their respective categories.

Teaching

Teaching Assistant | ECE 342 & 343 - Electronic Circuits   **Spring 2021**
- Course Instructor: Prof. Aili Wang

Teaching Assistant | ECE 313 - Probability with Engineering Application   **Fall 2020**
- Course Instructor: Prof. Mark Butala

Technical Skills

Languages: Python, C++, C#, Matlab, System Verilog
Developer Tools: Git, Kubernetes, Docker, CMake
Technologies/Frameworks: PyTorch, IsaacGym, ROS, Unity, Blender
Hardware: Unitree A1 & B1 & Go1, FPGA, Arduino

Service

- **Conference Reviewer for ICRA 2024**