YUNLONG WANG

Intelligent Robotic Perception and Control

SKILLS

Python

C++

ROS

Pytorch/Tensorflow

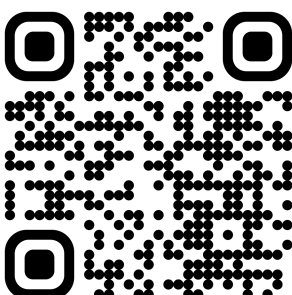**Issac Nvidia / Mujoco**

Docker

GIT

Latex

CONTACT

📍 Grundstr. 40
82061 Munich

📱 +49 01629538177

✉️ yunlong.wang.de@outlook.com

PROFILE

Proceeding Master's degree at the University of Hamburg with an impressive GPA of 1.8, I am on track to graduate in October 2024. My academic focus is on embodied multi-modal perception and control. I have a paper accepted as the first author at IROS 2024.

I have a keen interest in researching dexterous tool manipulation using multi-fingered hands. I have also published work on 6D pose estimation and am currently engaged in a project involving imitation learning.

In addition to my academic pursuits, I have substantial experience with simulation environments, notably Isaac Sim/Gym and Mujoco. I am proficient in robot control using ROS and MoveIt and have practical experience working with the Shadowhand robot and its accompanying robotic arm. Furthermore, my background includes coursework in NLP, LLM, pattern recognition, and signal processing. I have also accumulated approximately two years of experience in industrial computer vision before my master's study.

WORK EXPERIENCE

Working Student
Agile Robot SE

April 2024 - NOW

Conducting research and building demos with multi-modal imitation learning for dexterous tool manipulation tasks using the 7 DoF Diana7 robotic arm.

- Design and develop real-world and simulated scenarios for manipulation tasks.

- Collect multi-modal demonstration datasets in both simulation environments and real-world settings using VR equipment.

- Investigate the performance of diffusion policy with multi-modal perception.

- Develop a task and motion planning framework utilizing the language-conditioned diffusion policy for motion planning and a large language model for high-level task planning.

- Maintain hardware and documentation, and actively present results at group seminars.

Student Research Assistant
University of Hamburg - TAMS Group

April 2023 - April 2024

Responsible for supporting the group's research efforts with Issac Sim, conducting independent studies on 6D pose estimation, and publishing scientific findings at IROS as the main contributor.

LANGUAGE

Chinese — Native

English — Fluent

Germany — C1-level

- Build the simulation environment based on Issac Sim for the deformable manipulation task with a bi-manual Shadowhand robot hand.

- Conducted independent research on affordance-based 6D pose estimation, leading to the publication of a paper at the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS).

- Annotated and collected datasets in Isaac Gym for subsequent model training.

- Designed and trained model pipeline using PyTorch.

- Authored and published scientific papers based on research findings.

Application Engineering   Oct 2020 - April 2021
Corerain Technology

Responsible for designing, developing, implementing, and optimizing computer vision solutions to solve industrial problems and support technical integration for clients and stakeholders.

- Providing technical expertise and support to clients during the deployment and integration of their systems.

- Creating prototypes to demonstrate the feasibility of applications.

- Collaborating with software engineers, data scientists, and product managers to ensure cohesive integration of solutions.

- Containerizing applications enables fast and consistent deployment across different environments.

Computer Vision Engineer   Mar 2020 - Oct 2020
Agriculture Industry

Responsible for developing and deploying object detection technologies, creating and optimizing data pipelines and deep learning models, integrating systems, and training users to enhance farming efficiency and sustainability.

- Creating machine learning and computer vision algorithms for tasks such as crop identification and pest detection.

- Designing and deploying the entire data collection and data ETL pipeline to ensure accurate and efficient data handling.

- Continuously optimizing and maintaining deep learning models to improve accuracy and performance.

- Developing and deploying algorithm's APIs with docker for efficient, stable access.

- Integrating sensors and hardware for IOT devices.

PROJECT EXPERIENCE

EDUCATION

During my Master's study, I focused on multi-modal robotic perception and control. My coursework and projects emphasized integrating advanced perception capabilities with precise robotic control systems.

In our master's project, I worked within a team to develop a robotic music player system. This project provided valuable hands-on experience in creating a complex robotic system.

As a student research assistant, I developed a new method for categorical level 6D affordance pose estimation, serving as the first author for the resulting paper that was accepted at IROS. Additionally, I created the simulation environment in Isaac Sim to support the research efforts of my group.

In my Master's thesis at Agile Robot Company, I explored the use of collaborative robots, focusing on imitating human demonstrations to achieve safe and human-like motion through an efficient learning method. Additionally, I investigated the impact of multi-modal perception on learning-based robot control.

2015 - 2019

B. Eng. IOT.
(China Grade: 83/100)
Qingdao University of Science and Technology

The topic of my bachelor's thesis involved optimizing a two-phase OCR system using deep learning methods. Specifically, I fine-tuned and optimized the Mask R-CNN to accurately detect various types of content in PDF documents.

Master Project Oct. 2022 - Oct. 2023
University of Hamburg

Developed an advanced robotic system designed to play musical notes and chords on a marimba within group work, integrating optical music recognition, audio command processing, and precise motion control. Implemented a custom vision model to read notes, voice recognition for human commands, and audio feedback for performance evaluation. Utilized 3D-printed mechanisms and servomotors to replicate human-like mallet strikes. The project demonstrates the integration of robotics, music, computer vision, and audio processing. Full code and documentation are available on `https://github.com/UHHRobotics22-23/MarimbaBot`.

- Collected and annotated datasets to fine-tune the Donut model for OCR-free text understanding, enabling the extraction of structured music sequences.

- Voice recognition based on the Whipser model to interpret human commands.

- Motion planning based on the MoveIt and task planning using the behaviour tree.

- Employ the signal processing for music onset detection to evaluate the robot's performance