

Haolei Tong

✉ haoleitong24@gmail.com ☎ +49 015237990962 🌐 ThomassTon

📍 Darmstadt Germany 🎓 Google Scholar 🏠 Homepage



EDUCATION

TU Darmstadt

Master of Science, Autonomous systems and robotics

*Darmstadt, Germany
Oct. 2022 - Sep. 2025*

- GPA: 1.64
- **Coursework:** Foundations of Robotics, Data Mining and Machine Learning, Deep Learning, Reinforcement Learning

Zhejiang University of Science and Technology (ZUST)

Joint Bachelor's Program with FH Westküste, Germany

Bachelor of Science, Electrical Engineering and Automation

*Zhejiang, China
Sep. 2017 - Aug. 2021*

- GPA: 1.9

RESEARCH EXPERIENCE

Neura Robotics GmbH

Dual-Arm Planning Engineer

*Bielefeld, Germany
Dec. 2025 - Present*

- Working within the R&D team on **bimanual manipulation** leveraging **Reinforcement Learning** and **Vision-Language-Action (VLA)** models for next-generation robotic assistants.

Constrained Planning for Multi-Robot Collaboration

student research assistant

*PEARL, TU Darmstadt
Oct. 2024 - Sep. 2025*

- Introduced an NLP-based constrained sampling strategy to generate diverse, feasible configurations across foliated constraint manifolds.
- Tested the method on real-world dual-arm robotic platforms, including Franka Emika and Tiago.

Collision Handling in Simulation and SLAM UI Development

student research assistant

*SIM, TU Darmstadt
Sep. 2023 - Sep. 2024*

- Integrated collision detection mechanisms for both the robot and objects in the Webots simulation environment; visualized real-time collision states in RViz.
- Designed and implemented virtual line segments to act as collision triggers, along with a timing mechanism to record collision duration upon contact.
- Developed a lightweight UI on Raspberry Pi for handheld SLAM applications, featuring start/stop control, topic selection, and data recording status display.

PUBLICATION AND PREPRINT

Adaptive Diffusion Constrained Sampling for Bimanual Robot Manipulation

May 2025

Haolei Tong, Yuezhe Zhang, Sophie Lueth, Georgia Chalvatzaki

Accepted at Workshop on The Rational Robots Workshop, CoRL 2025

arxiv.org/abs/2505.13667 

MASTER THESIS

Adaptive Diffusion Constrained Sampling for Bimanual Robot Manipulation

*PEARL, TU Darmstadt
Dec. 2024 - May 2025*

Supervised by M.Sc. Yuezhe Zhang and Prof. in Georgia Chalvatzaki, Ph.D

Grade: 1.0 (Excellent)

- Proposed a generative sampling framework that integrates equality and inequality constraints into a unified energy-based diffusion model for dual-arm manipulation.
- Designed a Transformer-based mechanism for adaptive weighting of constraint-specific energies during inference, enabling context-aware sampling.
- Achieved high sample diversity and constraint satisfaction through a two-phase sampling strategy combining Langevin dynamics and density-aware resampling.

ACADEMIC PROJECTS

Narrow Passage Detection and Control Algorithm for Autonomous Ground Robots

github.com/NPDC 

- Implemented fast narrow passage detection using elevation maps via circular iterative expansion.
- Generated paths close to narrow passages based on arc geometry.
- Designed a Model Predictive Controller (MPC) to avoid collisions within narrow passages.

Multi-Robot Pick and Place

github.com/MRPP 

- Two robotic arms collaborate to complete the object grasping task.
- Computed the position of the second end-effector based on the first end-effector's pose and the object's geometry.
- Performed path planning using RRT and the KOMO optimization framework.

OTHER EXPERIENCE

Course Tutor

Robot Learning

*IAS, TU Darmstadt
Oct. 2023 - Mar. 2024*

- Responsible for Robot Learning course assignment grading and Q&A.

HONOURS AND AWARDS

Selected for ELLIS PhD Program Shortlist

Jan. 2026

European Laboratory for Learning and Intelligent Systems (Top-tier AI Network)

Outstanding Graduate Award (Top 5%)

2021

First-class School scholarships

2020, 2021

Second Place, China Robotics Competition

2019, 2020

PROGRAMMING SKILLS

Languages: Python, C++, C, C#

Technologies: Franka Robot, TIAGo Robot, ROS, Git, Gazebo, Webots, Isaac Sim, Rviz

REFERENCES

Prof. Georgia Chalvatzaki, Ph.D

Computer Science Department of the Technical University of Darmstadt, PEARL Lab

Email: georgia.chalvatzaki@tu-darmstadt.de

Prof. Dr. Oskar von Stryk

Computer Science Department of the Technical University of Darmstadt, SIM Lab

Email: stryk@sim.tu-darmstadt.de