

# Haolei Tong

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📍 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*

*Zhejiang, China*

*Bachelor of Science, Electrical Engineering and Automation*

*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](https://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

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### Narrow Passage Detection and Control Algorithm for Autonomous Ground Robots

[github.com/NPDC](https://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](https://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

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### Course Tutor

Robot Learning

IAS, TU Darmstadt

Oct. 2023 - Mar. 2024

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

## HONOURS AND AWARDS

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### 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

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

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

## REFERENCES

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### 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

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