Liding Zhang, Ph.D.candidate (Dr.rer.nat)
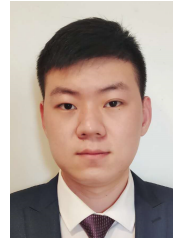
✉ lidingzhangbruce@foxmail.com 🏠 scholar.google.com 🔗 linkedin

🌐 ce.cit.tum.de/air/people/liding-zhang-msc 🐙 github.com/liding-zhang

Employment History

2022 – ····

Research Assistant
Chair of Robotics, Artificial Intelligence and Real-Time Systems, TUM School of Computation, Information and Technology (CIT), Technical University of Munich (TUM).

Scientific Researcher
TUM School of Munich Institute of Robotics and Machine Intelligence (MIRMI), Technical University of Munich (TUM).

Project Associate
Bavarian State Ministry for Economic Affairs, Regional Development and Energy (StMWi) for the Lighthouse Initiative KI.FABRIK (AI.Factory), (Grant no. DIK0249).

Project Associate
Federal Ministry of Education and Research of Germany (BMBF) in the programme of "Souverän. Digital. Vernetzt." Joint project 6G-life, (Grant no. 16KISK002).

2021 – 2022

Project Associate
Bicycle ergometer in the laboratory for biomechanics project, Institute of Mechanical Engineering, Technical University of Clausthal.

2019 – 2020

Assistant Mechanical Engineer
Noise, vibration, and harshness (NVH) group of Volkswagen Automatic Transmission (Tianjin) Co. Ltd. · Full-time.

2016 – 2017

Mechanical Engineer Intern
Industrial Manufacturing group of Kisters-Stiftung gemeinnützige GmbH · Part-time.

Education

2022 – ····

Ph.D., Technical University of Munich (DE) - Computer Science - Robotics.
Thesis title (temp.): *Sampling-based Almost-surely Asymptotic Optimal Motion Planning for Heterogeneous Robot Manipulation in Constrained Configuration Spaces.*

2020 – 2022

M.Sc., Technical University of Clausthal (DE) - Automation Technology.
Thesis title: *Vibration Measurement in the Gigahertz Range at Frequencies Exceeding the Bandwidth of Photodetectors in the Visible Frequency Range (about >2.5 GHz).*

2016 – 2020

B.Sc., Rhine-Waal University of Applied Science (DE) - Mechanical Engineering.
Thesis title: *Comprehensive Analytic and Numerical Inverse Dynamics Approaches to the Classic Sliding-Rod Problem.*

## Selected Research Publications (*Equal Contribution)

Journal Articles

1. K. Cai*, **L. Zhang***, X. Su, K. Chen, C. Wang, S. Haddadin, A. Knoll, A. Ajoudani, and L. Figueredo, "Just in time informed trees: Manipulability-aware asymptotically optimized motion planning," *IEEE/ASME Transactions on Mechatronics (T-Mech)*, pp. 1–12, 2025, **[JCR Q1, IF: 7.3]**. 🔗 DOI: 10.1109/TMECH.2025.3570573.

2   **L. Zhang**, K. Cai, Z. Bing, C. Wang, and A. Knoll, "Genetic informed trees (GIT*): Path planning via reinforced genetic programming heuristics," *Biomimetic Intelligence and Robotics*, vol. 5, no. 3, p. 100 237, 2025, **[JCR Q1, IF: 5.5]**, ISSN: 2667-3797. 🔗 DOI: `10.1016/j.birob.2025.100237`.

3   **L. Zhang**, K. Cai, Z. Sun, Z. Bing, C. Wang, L. Figueredo, S. Haddadin, and A. Knoll, "Motion planning for robotics: A review for sampling-based planners," *Biomimetic Intelligence and Robotics*, vol. 5, no. 1, p. 100 207, 2025, **[JCR Q1, IF: 5.5]**, ISSN: 2667-3797. 🔗 DOI: `10.1016/j.birob.2024.100207`.

4   **L. Zhang**, K. Cai, Y. Zhang, Z. Bing, C. Wang, F. Wu, S. Haddadin, and A. Knoll, "Estimated informed anytime search for sampling-based planning via adaptive sampler," *IEEE Transactions on Automation Science and Engineering (T-ASE)*, vol. 22, pp. 18 580–18 593, 2025, **[JCR Q1, IF: 6.4]**. 🔗 DOI: `10.1109/TASE.2025.3590084`.

5   **L. Zhang**, Y. Ling, Z. Bing, F. Wu, S. Haddadin, and A. Knoll, "Tree-based grafting approach for bidirectional motion planning with local subsets optimization," *IEEE Robotics and Automation Letters (RA-L)*, vol. 10, no. 6, pp. 5815–5822, 2025, **[JCR Q1, IF: 5.3]**. 🔗 DOI: `10.1109/LRA.2025.3562369`.

6   **L. Zhang**, S. Wang, K. Cai, Z. Bing, F. Wu, C. Wang, S. Haddadin, and A. Knoll, "APT*: Asymptotically optimal motion planning via adaptively prolated elliptical r-nearest neighbors," *IEEE Robotics and Automation Letters (RA-L)*, vol. 10, no. 10, pp. 10 242–10 249, 2025, **[JCR Q1, IF: 5.3]**. 🔗 DOI: `10.1109/LRA.2025.3598616`.

Conference Proceedings

1   **L. Zhang**, K. Chen, K. Cai, Y. Zhang, Y. Dang, Y. Wu, Z. Bing, F. Wu, S. Haddadin, and A. Knoll, "Direction informed trees (DIT*): Optimal path planning via direction filter and direction cost heuristic," in *2025 IEEE International Conference on Robotics and Automation (ICRA)*, 2025, pp. 1766–1772. 🔗 DOI: `10.1109/ICRA55743.2025.11127725`.

2   **L. Zhang**, Z. Li, K. Cai, Z. Bing, and A. Knoll, "Language-exclusive mobile manipulation for efficient object search in indoor environments," in *2025 IEEE International Conference on Cyborg and Bionic Systems (CBS) Accepted*, 2025.

3   **L. Zhang**, S. Wang, K. Cai, Z. Bing, and A. Knoll, "Multi-sets trees (MST*): Accelerated asymptotically optimal motion planning optimization informed by multiple domain subsets," in *2025 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) Accepted*, 2025.

4   **L. Zhang**, Y. Wei, K. Cai, Z. Bing, Y. Meng, F. Wu, S. Haddadin, and A. Knoll, "CIT*: Context-based biased batch-sampling for almost-surely asymptotically optimal motion planning," in *2025 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) Accepted*, 2025.

5   **L. Zhang**, Q. Zong, Y. Zhang, Z. Bing, and A. Knoll, "Deep fuzzy optimization for batch-size and nearest neighbors in optimal robot motion planning," in *2025 IEEE International Conference on Cyborg and Bionic Systems (CBS) Accepted*, 2025.

6   M. Schewe*, **L. Zhang***, and C. Rembe, "Signal processing scheme for broadband heterodyne gigahertz interferometry with a broadband and a second low-noise photodetector with limited bandwidth," in *Journal of Physics: Conference Series*, vol. 2698, 2024, p. 012 012. 🔗 DOI: `10.1088/1742-6596/2698/1/012012`.

7   **L. Zhang**, Z. Bing, K. Chen, L. Chen, K. Cai, Y. Zhang, F. Wu, P. Krumbholz, Z. Yuan, S. Haddadin, and A. Knoll, "Flexible informed trees (FIT*): Adaptive batch-size approach in informed sampling-based path planning," in *2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2024, pp. 3146–3152. 🔗 DOI: `10.1109/IROS58592.2024.10802466`.

8   **L. Zhang**, Z. Bing, Y. Zhang, K. Cai, L. Chen, F. Wu, S. Haddadin, and A. Knoll, "Elliptical k-nearest neighbors - path optimization via coulomb's law and invalid vertices in c-space obstacles," in *2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2024, pp. 12 032–12 039. 🔗 DOI: `10.1109/IROS58592.2024.10802280`.

Skills

Languages	■	Proficient in reading, writing, and speaking English, Chinese (native), and German.
Coding	■	C++, C, Python, MATLAB/Simulink, JSON, XML, URDF, XACRO, LaTeX, Arduino …
Drafting	■	Solidworks, AutoCAD, Catia, ANSYS, PLC (Ladder/Functional block diagrams) …
Robot Dev.	■	ROS1/ROS2, Git, Linux, Docker, Moveit!, CoppeliaSim, Gazebo, Mujoco, OMPL …
Misc.	■	Academic research, teaching, training, consultation, LaTeX typesetting, and publishing.

Miscellaneous Experience

Awards and Achievements

2025 ■ **Editor's Choice (Biomimetic Intelligence and Robotics) [JCR Q1, IF: 5.5]**,
The top selected papers from the Survey on Robotic Motion Planning in the Issue 1, 2025.

2023 ■ **China Scholarship Council (CSC)**,
Full-Scholarship funded by the Ministry of Education of the People's Republic of China.

2022 ■ **Department Prize of Applied Metrology**,
Recommendation letter from Prof. Dr.-Ing Christian Rembe (Chairman of the German University Lecturers), Institute of Electrical Information Technology, Technical University of Clausthal.

■ **Department Prize for Outstanding Student Performance**,
Recommendation letter from Dr.-Ing. Marvin Schewe (Postdoctoral researcher at NIST, USA) , Institute of Electrical Information Technology, Technical University of Clausthal.

2019 ■ **Department Prize of Noise, Vibration, and Harshness (NVH)**.
Recommendation letter from Mr. Vollrath Andreas (Head of quality assurance) and Mrs. Stefanie Wangemann (Head of org. & education) , Volkswagen Automatic Transmission (Tianjin) Co. Ltd.

Certification

2022 ■ **Certified Deutsch (German) C1/2 (highest-level)**,
Awarded by Dr. Jörg Schröder (Stellv. Leiter des Sprachenzentrums), Stufe nach Gemeinsamen Europäischem, Technical University of Clausthal.

2010 ■ **1st Prize of National Trumpet Junior Group**,
Awarded by China Musical Instruments Association (Western Musical Instruments), China.

2009 ■ **Certified Profession Level 9 in Trumpet**.
Awarded by Wuhan Conservatory Of Music Association, China.

Service

Reviewer:	IEEE International Conference on Robotics and Automation (ICRA),
	IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS),
	IEEE-RAS International Conference on Humanoid Robots (Humanoids),
	IEEE International Conference on Cyborg and Bionic Systems (CBS),
	IEEE Robotics and Automation Letters (RA-L),
	IEEE Transactions on Automation Science and Engineering (T-ASE),
	IEEE/ASME Transactions on Mechatronics (T-Mech),
	IEEE Transactions on Neural Networks and Learning Systems (TNNLS),
	Biomimetic Intelligence and Robotics.
Chair:	2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS),
	Teaser Session of Robot Motion Planning IV, ADNEC in Abu Dhabi, UAE.