ZHONGYU LI

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RESEARCH INTERESTS

I am interested in creating new generations of dynamic robots, such as humanoids and other bio-inspired robots, to make them more intelligent, agile, robust, and safe, and ultimately, useful. My research lies in the combination of control, optimization, motion planning, reinforcement learning, imitation learning, and multi-agent interaction.

EDUCATION

University of California, Berkeley, Dept. of Mechanical Engineering — California, USA
Ph.D. in Mechanical Engineering (Focus: Controls and Robotics) — Aug 2019 – May 2025

- Advisor: Prof. Koushil Sreenath; GPA: 3.90/4.00
- Dissertation: The Robot Cerebellum: Toward Safe, Agile and Intelligent Legged Robotics. [Link]

Zhejiang University, Chu Kochen Honors College — Zhejiang, China
B.E. in Mechatronics Engineering — Sept 2014 – July 2019

- GPA: 3.88/4.00, Major GPA: 3.90/4.00; top 5% out of 131
- Semester Exchange Student in the Dept. of Mechanical Engineering, Columbia University, USA. GPA: 4.17/4.33
- Thesis: Transferring Animation to the Control of Bipedal Robot, *Best Undergraduate Thesis Award*

PROFESSIONAL EXPERIENCE

Assistant Professor, *Mechanical and Automation Engineering* — October 2025 –
The Chinese University of Hong Kong — Hong Kong, China

Graduate Student Researcher, *Mechanical Engineering* — Aug 2019 – May 2025
University of California, Berkeley. *Advisor: Prof. Koushil Sreenath* — Berkeley, USA

Undergraduate Researcher (Visiting), The Robotics Institute — Aug 2017 – Aug 2018
Carnegie Mellon University. *Advisor: Prof. Ralph Hollis* — Pittsburgh, USA

AWARDS & HONORS

- **Selected as one of the Rising Stars in Mechanical Engineering (in the US)** 2023
- **Selected as one of 30 RSS Pioneers (across the globe)** 2023
- William S. Floyd, Jr. Graduate Student Fellowship at UC Berkeley 2022
- **IROS Best RoboCup Paper Finalist** 2022
- Graduate Division Block Grant Award in Mechanical Engineering at UC Berkeley 2021
- **ICRA Best Service Robot Paper Finalist** 2021
- **IROS Best Entertainment and Amusement Paper Finalist** 2020
- IROS Student and Developing Countries (SDC) Travel Award 2019
- Best Undergraduate Thesis Award at Zhejiang University 2019

PUBLICATIONS

(*Equal Contribution, †Project Lead, §Equal Advising)

Peer-Reviewed Journals

[J1] **Z. Li**, X. B. Peng, P. Abbeel, S. Levine, G. Berseth, K. Sreenath, "Reinforcement Learning for Versatile, Dynamic, and Robust Bipedal Locomotion Control." *International Journal of Robotics Research (IJRR),* 2024.
[Paper][Video] Media: [MIT Technology Review]

[J2] **Z. Li**, J. Zeng, S. Chen and K. Sreenath, "Autonomous Navigation of Bipedal Robots in Height-Constrained Environments." *International Journal of Robotics Research (IJRR),* 2023.
[Paper][Video] Media: [Video Friday]

[J3] H. Zhang, **Z. Li**†(project lead), X. Zeng, L. Smith, K. Stachowicz, D. Shah, L. Yue, Z. Song, W. Xia, S. Levine, K. Sreenath, Y. H. Liu, "Traversability-Aware Legged Navigation by Learning from Real-World Visual Data." *IEEE Transactions on Robotics* (*T-RO*), 2025.
[Paper]

[J4] C. Yang*, G. N. Sue*, **Z. Li***(co-first author), L. Yang, H. Shen, Y. Chi, A. Rai, J. Zeng, K. Sreenath, "Collaborative Navigation and Manipulation of a Cable-towed Load by Multiple Quadrupedal Robots." *IEEE Robotics and Automation Letters (RA-L)*, 2022.
[Paper][Video] Media: [Video Friday]

Journals in Review

[RJ1] W. T. Chen*, M. Nguyen*, **Z. Li***(co-first author), G. N. Sue, K. Sreenath, "Decentralized Navigation of a Cable-Towed Load using Quadrupedal Robot Team via MARL." *arXiv preprint arXiv:2503.18221*, 2025. (under Major Revision in *IEEE Transactions on Robotics (T-RO)*)
[Paper][Video]

[RJ2] C. Dai*, X. Liu*, K. Sreenath, **Z. Li**, R. Hollis, "Interactive Navigation with Adaptive Non-prehensile Mobile Manipulation." *arXiv preprint arXiv:2410.13418*, 2024. (under Major Revision in *IEEE Robotics and Automation Letters* (RA-L))
[Paper]

[RJ3] L. Yue, Z. Song, J. Dong, **Z. Li**, H. Zhang, L. Zhang, X. Zeng, K. Sreenath, Y. H. Liu, "Online Omnidirectional Jumping Trajectory Planning for Quadrupedal Robots on Uneven Terrains." *arXiv preprint arXiv:2411.04494,* 2024. (in submission to *International Journal of Robotics Research (IJRR))*
[Paper]

Peer-Reviewed Conferences

[C1] Z. Su*, Y. Gao*, E. Lukas*, Y. Li, J. Cai, F. Tulbah, F. Gao, C. Yu, **Z. Li§**(equal advising), Y. Wu§, K. Sreenath§, "Toward Real-World Cooperative and Competitive Soccer with Quadrupedal Robot Teams." *Conference on Robot Learning (CoRL)*, 2025.
[Paper]

[C2] Y. Ouyang, J. Li, Y. Li, **Z. Li**†(project lead), C. Yu, K. Sreenath, Y. Wu, "Long-horizon Locomotion and Manipulation on a Quadrupedal Robot with Large Language Models." *International Conference on Intelligent Robots and Systems (IROS),* 2025.
[Paper]

[C3] Z. Chen*, X. He*, Y. J. Wang*, Q. Liao, Y. Ze, **Z. Li**, S. Sastry, J. Wu, K. Sreenath, S. Gupta, X. B. Peng, "Learning Smooth Humanoid Locomotion through Lipschitz-Constrained Policies." *International Conference on Intelligent Robots and Systems (IROS),* 2025.
[Paper][Website]

[C4] Y. Chi, Q. Liao, J. Long, X. Huang, S. Shao, B. Nikolic, **Z. Li**†(project lead), K. Sreenath, "Demonstrating Berkeley Humanoid Lite: An Open-source, Accessible, and Customizable 3D-printed Humanoid Robot." *Robotics: Science and System* (*RSS*), 2025.
[Paper][Website]

[C5] Y. Shao, X. Huang, B. Zhang, Q. Liao, Y. Gao, Y. Chi, **Z. Li**, S. Shao, K. Sreenath, "LangWBC: Language-directed Humanoid Whole-Body Control via End-to-end Learning." *Robotics: Science and System* (*RSS*), 2025.
[Paper][Website]

[C6] K. Ryu, Q. Liao, **Z. Li**, K. Sreenath, N. Mehr, "CurricuLLM: Automatic Task Curricula Design for Learning Complex Robot Skills using Large Language Models." *International Conference on Robotics and Automation (ICRA),* 2025.
[Paper]

[C7] Q. Liao, B. Zhang, X. Huang, X. Huang, **Z. Li**, K. Sreenath, "Berkeley Humanoid: A Research Platform for Learning-based Control." *International Conference on Robotics and Automation (ICRA),* 2025.
[Paper][Website] Media: [IEEE Spectrum Feature]

[C8] X. Huang*, Y. Chi*, R. Wang*, **Z. Li**†(project lead), X. B. Peng, S. Shao, B. Nikolic, K. Sreenath, "DiffuseLoco: Real-Time Legged Locomotion Control with Diffusion from Offline Datasets." *Conference on Robot Learning (CoRL)*, 2024.
[Paper]

[C9] Z. He, K. Lei, Y. Ze, K. Sreenath, **Z. Li**, H. Xu, "Learning Visual Quadrupedal Loco-Manipulation from Demonstrations." *International Conference on Intelligent Robots and Systems (IROS),* 2024.
[Paper][Website]

[C10] Z. Su*, X. Huang*, D. Ordoñez-Apraez, Y. Li, **Z. Li**, Q. Liao, G. Turrisi, M. Pontil, C. Semini, Y. Wu, K. Sreenath, "Leveraging Symmetry in RL-based Legged Locomotion Control." *International Conference on Intelligent Robots and Systems (IROS),* 2024.
[Paper][Website]

[C11] X. Huang, Q. Liao, Y. Ni, **Z. Li**†(project lead), L. Smith, S. Levine, X. B. Peng, K. Sreenath, "HiLMa-Res: A General Hierarchical Framework via Residual RL for Combining Quadrupedal Locomotion and Manipulation." *International Conference on Intelligent Robots and Systems (IROS)*, 2024.
[Paper][Video]

[C12] **Z. Li**, X. B. Peng, P. Abbeel, S. Levine, G. Berseth, K. Sreenath, "Robust and Versatile Bipedal Jumping Control through Reinforcement Learning." *Robotics: Science and Systems (RSS),* 2023.
[Paper][Video] Media: [Video Friday]

[C13] Q. Liao, **Z. Li**†(project lead), A. Thirugnanam, J. Zeng, and K. Sreenath, "Walking in Narrow Spaces: Safety-critical Locomotion Control for Quadrupedal Robots with Duality-based Optimization." *International Conference on Intelligent Robots and Systems (IROS),* 2023.
[Paper][Video][Code] Media: [Video Friday]

[C14] X. Huang*, **Z. Li***(co-first author), Y. Xiang, Y. Ni, Y. Chi, Y. Li, L. Yang, X. B. Peng, K. Sreenath, "Creating a Dynamic Quadrupedal Robotic Goalkeeper with Reinforcement Learning." *International Conference on Intelligent Robots and Systems (IROS),* 2023.
[Paper][Video] Media: [IEEE Spectrum Feature][Tech Xplore][TechCrunch][DailyMail][DailyMail]

[C15] Y. Zeng, S. He, H. H. Nguyen, **Z. Li**, K. Sreenath, J. Zeng, "i2LQR: Iterative LQR for Iterative Tasks in Dynamic Environments." *Conference on Decision and Control (CDC)*, 2023.
[Paper]

[C16] G. Feng*, H. Zhang*, **Z. Li**†(project lead), X. B. Peng†(project lead), B. Basireddy, L. Yue, Z. Song, L. Yang, Y. Liu, K. Sreenath, S. Levine, "GenLoco: Generalized Locomotion Controllers for Quadrupedal Robots." *Conference on Robot Learning (CoRL)*, 2022.
[Paper][Video][Code]

[C17] Y. Ji*, **Z. Li***(co-first author), Y. Sun, X. B. Peng, S. Levine, G. Berseth, K. Sreenath, "Hierarchical Reinforcement Learning for Precise Soccer Shooting Skills using Quadrupedal Robots." *International Conference on Intelligent Robots and Systems (IROS),* 2022.
Best RoboCup Paper Finalist. [Paper][Video] Media: [Video Friday][Tech Xplore]

[C18] A. Kumar*, **Z. Li***(co-first author), J. Zeng, D. Pathak, K. Sreenath, J. Malik, "Adapting Rapid Motor Adaptation for Bipedal Robots." *International Conference on Intelligent Robots and Systems (IROS),* 2022.
[Paper][Video]

[C19] A. Sripathy, A. Bobu, **Z. Li**, K. Sreenath, D. S. Brown, A. D. Dragan, "Teaching Robots to Span the Space of Functional Expressive Motion." *International Conference on Intelligent Robots and Systems (IROS),* 2022.
[Paper][Video]

[C20] **Z. Li**, J. Zeng, A. Thirugnanam, K. Sreenath, "Bridging Model-based Safety and Model-free Reinforcement Learning through System Identification of Low Dimensional Linear Models." *Robotics: Science and Systems (RSS),* 2022.
[Paper][Video]

[C21] L. Yang*, **Z. Li***(co-first author), J. Zeng, K. Sreenath, "Bayesian Optimization Meets Hybrid Zero Dynamics: Safe Parameter Learning for Bipedal Locomotion Control." *International Conference on Robotics and Automation (ICRA),* 2022.
[Paper][Video]

[C22] S. Gilroy, D. Lau, L. Yang, E. Izaguirre, K. Biermayer, A. Xiao, M. Sun, A. Agrawal, J. Zeng, **Z. Li**†(project lead) and K. Sreenath, "Autonomous navigation for quadrupedal robots with optimized jumping through constrained obstacles." *International Conference on Automation Science and Engineering (CASE),* 2021.
[Paper][Video] Media: [Video Friday]

[C23] J. Zeng*, **Z. Li***(co-first author) and K. Sreenath, "Enhancing Feasibility and Safety of Nonlinear Model Predictive Control with Discrete-Time Control Barrier Functions." *Conference on Decision and Control (CDC)*, 2021.
[Paper]

[C24] **Z. Li**, X. Cheng, X. Peng, P. Abbeel, S. Levine, G. Berseth and K. Sreenath, "Reinforcement Learning for Robust Parameterized Locomotion Control of Bipedal Robots." *International Conference on Robotics and Automation (ICRA),* 2021.
[Paper][Video] Media: [MIT Technology Review][Tech Xplore][Inverse][MathWorks][heise (German)][DeepTech (Chinese)]

[C25] A. Xiao, W. Tong, L. Yang, J. Zeng, **Z. Li**†(project lead) and K. Sreenath, "Robotic Guide Dog: Leading a Human with Leash-Guided Hybrid Physical Interaction." *International Conference on Robotics and Automation (ICRA),* 2021.
Best Service Robot Paper Finalist. [Paper][Video] Media: [Daily Mail][New Scientist][Tech Xplore][Daily Californian][Independent][Futurism][China Daily][DeepTech (Chinese)]

[C26] J. Zeng, B. Zhang, **Z. Li** and K. Sreenath, "Safety-Critical Control with Optimal-decay Control Barrier Functions with Guaranteed Point-wise Feasibility." *American Control Conference (ACC),* 2021.
[Paper]

[C27] **Z. Li**, C. Cummings and K. Sreenath, "Animated Cassie: A Dynamic Relatable Robotic Character." *International Conference on Intelligent Robots and Systems (IROS),* 2020.
Best Entertainment and Amusement Paper Finalist. [Paper][Video] Media: [Video Friday]

[C28] **Z. Li** and R. Hollis. "Toward A Ballbot for Physically Leading People: A Human-Centered Approach." *International Conference on Intelligent Robots and Systems (IROS),* 2019.
[Paper][Video] Media: [Video Friday, IEEE Spectrum]

INVITED TALKS

- **Can We Bridge Model-based Control and Model-free RL on Legged Robots?**
  - 09/2022, GRASP SFI, University of Pennsylvania [Video]
  - 09/2022, Mila – Quebec AI Institute
  - 11/2022, Beijing Academy of Artificial Intelligence (BAAI)
- **Towards Safe, Robust, and Dynamic Legged Robots and Beyond**
  - 07/2023, Southern University of Science and Technology (SUSTech)
  - 08/2023, Institute for Interdisciplinary Information Sciences, Tsinghua University
  - 08/2023, Huzhou Research Institute, Zhejiang University
  - 02/2024, Seminar in the group of Prof. Guanya Shi, Carnegie Mellon University
  - 03/2024, Seminar in the group of Prof. Ding Zhao, Carnegie Mellon University
  - 04/2024, Berkeley Control Seminar, UC Berkeley
  - 09/2024, AI Institute, Shanghai Jiao Tong University
  - 10/2024, Seminar in the group of Prof. Sophia Shao, UC Berkeley
- **Towards General-Purpose Robots from the Perspectives of Legged Robots**
  - 06/2024, Guest Lecture in Deep Learning, IIIS, Tsinghua University

TEACHING

University of California, Berkeley

Graduate Student Instructor

- [DEWA]: **Optimization & Machine Learning with Applications to Energy Systems** 2020 - 2024
  Graduate Level, Class Size: ~20, 2 Classes per Year
  Role: Leading discussion session; Grading.
- [E7]: **Introduction to Computer Programming for Scientists and Engineers** Fall 2020
  Undergrad. Level, Class Size: ~200
  Role: Leading discussion session; Teaching lab session.

Zhejiang University

Part-time 2014-2015

Volunteer Teacher

Leading discussion session (~160 students) in a primary school for underrepresented students

STUDENT MENTORING

Berkeley Students:

Alumni Stats (by 10/2024): 25/34 had one or more publications, 30/34 continued in robotics research.

C. Cummings, Undergrad → M.S./Ph.D. at Penn State MechE Best Amusement Paper Finalist in IROS 2020, Pub: [C27]

H. Wang, Undergrad → Ph.D. at UMN MechE	
L. Yang, Undergrad → Ph.D. at Caltech MechE	Best Service Paper Finalist in ICRA 2021, Pub: [C{25, 22, 21, 16, 14}, J4]
A. Xiao, Visiting → Ph.D. at NUS CS	Best Service Robot Paper Finalist in ICRA 2021, Pub: [C{25, 22}]
W. Tong, Visiting → M.S at UMich Robotics	Best Service Robot Paper Finalist in ICRA 2021, Pub: [C25]
S. Gilroy, M.Eng → Boston Dynamics	Pub: [C22]
D. Lau, M.Eng → Nissan Motor Corporation	Pub: [C22]
M. Sun, Undergrad → M.S. at Penn GRASP	Pub: [C22]
X. Cheng, Visiting → M.S. at CMU RI	Pub: [C24]
C. Yang, Visiting → M.S. at ETH Robotics	Pub: [J4]
G. N. Sue, Undergrad → M.S. at CMU RI	Pub: [J4]
H. Shen, Undergrad → M.S. at Berkeley EECS	Pub: [J4]
Y. Chi, Undergrad → Ph.D. at Berkeley EECS	Pub: [C{4, 8}, J4]
Y. Ji, M.Eng → Research Intern at MIT	Best RoboCup Paper Finalist in IROS 2022, Pub: [C17]
Y. Sun, M.Eng → Q. Bio	Best RoboCup Paper Finalist in IROS 2022, Pub: [C17]
J. Navarro, M.S. → UC Berkeley	
Z. Zang, Undergrad → Co-Founder of Starpath Robotics	
M. Zhang, Visiting → Hedge Fund	
Y. Xiang, Visiting → M.S. at ETH Robotics	Pub: [C14]
H. Zhang, Visiting → Ph.D. at CUHK Robotics	Pub: [C16, J3]
B. Basireddy, Undergrad → Lacework	Pub: [C16]
Q. Liao, Visiting → Ph.D. at Berkeley MechE	Pub: [C{4, 5, 6, 7, 11, 13}]
X. Liu, Visiting → M.S. at CMU RI	Pub: [RJ2]
X. Huang, Visiting → Ph.D. at Berkeley MechE	Pub: [C{4, 5, 7, 8, 10, 11, 14}]
M. Nguyen, Undergrad → M.S. at Berkeley EECS	
V. Sangli, Undergrad	
K. Wang, Visiting	
J. Long, Visiting	
Y. Ni, Undergrad (Co-mentored) → M.S. at Stanford CS	Pub: [C{11, 14}]
G. Feng, Undergrad (Co-mentored) → Quant Trading	Pub: [C16]
S. Gschwind, Undergrad (Co-mentored)	
Z. Su, Undergrad (Co-mentored)	Pub: [C10]
Z. He, Undergrad (Co-mentored)	Pub: [C9]
C. Dai, M.S. at CMU RI (Co-mentored)	Pub: [RJ2]

Outreach:

K. Fletcher, Amgen Scholars Program, Summer 2021
K. Mehrizi, Transfer-to-Excellence Research Program, Summer 2021
A. Zhou, High School Research Intern, Summer 2023

ACADEMIC SERVICE

Journal Reviewer:
The International Journal of Robotics Research (IJRR), Transactions on Robotics (T-RO), Transactions on Mechatronics (T-Mech), Transactions on Pattern Analysis and Machine Intelligence (TPAMI), Robotics and Automation Letters (RA-L), Robotics & Automation Magazine (RAM), Transactions on Cognitive and Developmental Systems (TCDS), Frontiers in Neurorobotics, Transactions on Industrial Electronics, Journal of Zhejiang University (JZUSA).

Conference Reviewer:
Robotics: Science and Systems (RSS), International Conference on Robotics and Automation (ICRA), International Conference on Intelligent Robots and Systems (IROS), International Conference on Humanoid Robots (Humanoids), International Conference on Automation Science and Engineering (CASE), The Conference on Robot Learning (CoRL), Conference on Decision and Control (CDC), Control Conference Africa (CCA).