

Lening Li

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RESEARCH INTERESTS

Reinforcement Learning ◦ Optimal Control ◦ Game Theory ◦ Formal Methods

EDUCATION

Worcester Polytechnic Institute (WPI)

Worcester, MA, USA

Ph.D. in Robotics Engineering

Aug. 2016 - Dec. 2022

- Thesis: “Optimal Control and Reinforcement Learning for Stochastic Systems under Temporal Logic Specifications”

M.S. in Robotics Engineering

Aug. 2016 - May 2018

M.S. in Computer Science

Aug. 2014 - May 2016

- Thesis: “Birrtopt: A combined software framework for motion planning applied on Atlas robot”

Harbin Institute of Technology (HIT)

China

B.S. in Computer Science

Sep. 2010 - Jul. 2014

- Summa Cum Laude (Top 5% of class)
- Thesis: “Contourlet Transform Based Image Compression”

B.A. in English Language & Literature

Sep. 2011 - Jul. 2014

- Thesis: “A Study on the Male Chauvinism in *Women in Love*”

CERTIFICATIONS

Certified REC Foundation Coach

Sep. 2023 - Sep. 2024

Robotics Education & Competition Foundation

Online

Coach and mentor robotics teams, fostering student growth in STEM and competitive engineering.

Certified FIRST Tech Challenge (FTC) Coach

Nov. 2022 - May 2023

FIRST Robotics

Online

Led and mentored FTC robotics teams, guiding students in robot design, programming, and competition strategy.

Certification in College Teaching

Jun. 2017 - Aug. 2019

Higher Education Consortium of Central Massachusetts (HECCMA)

Worcester, MA, USA

Professionally trained in evidence-based pedagogy to deliver high-quality courses.

INDUSTRY & ADVISORY EXPERIENCE

Robotics Lab Advisor

Dec. 2025 - Present

Harvard University

Cambridge, MA, USA

- Advise student research projects in robotics, with emphasis on algorithm design, experimental rigor, and reproducible evaluation.
- Provide technical mentorship spanning reinforcement learning, planning/control, and safety-oriented system design, bridging academic research and deployed robotics.
- Support lab execution through research reviews, project scoping, and structured feedback to improve research velocity and quality.

Senior Software Engineer*Symbolic*Oct. 2022 - Present
Wilmington, MA, USA

- Designed and deployed scalable multi-agent path-planning and coordination algorithms for large-scale robotic warehouse systems in C++.
- Improved fleet-level robustness through advances in control design, state estimation, and fault-tolerant behavior architectures.
- Optimized real-time decision-making pipelines across thousands of autonomous robots operating under strict latency constraints.

Senior Software Engineer*Berkshire Grey*Oct. 2021 - Aug. 2022
Bedford, MA, USA

- Led the development of perception and manipulation algorithms for picking previously unseen SKUs using ROS, C++, and Python.
- Reduced end-to-end system latency by redesigning inter-process communication and execution pipelines.

Software Engineering Intern*Rudolph Technologies*Jun. 2015 - Jan. 2016
Tewksbury, MA, USA

- Designed an automated tool to migrate multiple legacy codebases onto a unified platform.
- Developed methods to improve data accuracy in wafer-defect collection and analysis pipelines.

Software Engineering Intern*Neusoft*Jul. 2013 - Aug. 2013
China

- Built a map management system supporting streamlined insert, delete, and edit operations.

REPRESENTATIVE SKILLS

Programming Languages:	C/C++, Python, MATLAB
Robotics & Control:	Motion Planning, Optimal Control, Reinforcement Learning
Robotic Systems:	ROS, ROS 2, Distributed Robotic Systems
Machine Learning:	PyTorch, TensorFlow
Languages:	English (Fluent), Chinese (Native)

TEACHING

Teaching Assistant*RBE 549. Computer Vision, WPI*Aug. 2022 - Dec. 2022
Worcester, MA, USA

- Contributed to the design and delivery of a new computer vision course.
- Delivered lectures and supported student learning through structured office hours.
- Course website: <https://nitinjsanket.github.io/teaching/rbe549/fall2022.html>

Teaching Assistant*RBE 3001 & 3002. Unified Robotics III & IV, WPI*Aug. 2020 - May 2021
Worcester, MA, USA

- Supervised labs on 3D-printed robot-arm control and mobile robot navigation.
- Created and assessed final projects, lab reports, and homework assignments.

Teaching Assistant*RBE 549. Computer Vision, WPI*Aug. 2018 - Dec. 2018
Worcester, MA, USA

- Delivered lectures and held office hours to support student learning and project execution.

Teaching Assistant*RBE 1001. Introduction to Robotics, WPI*

Aug. 2017 - May 2018

Worcester, MA, USA

- Managed and mentored a team of five undergraduate peer learning assistants.
- Created and assessed final projects, lab reports, and homework assignments.

REPRESENTATIVE PROJECTS

DARPA Robotics Challenge*Researcher*

Aug. 2014 - May 2015

Worcester, MA, USA

- Collaborated with a Carnegie Mellon University team on the Atlas humanoid robot developed by Boston Dynamics.
- Designed a motion planner for arm manipulation tasks including door opening, valve turning, and tool grasping.
- Led the design of a human-robot interaction interface to improve operator effectiveness and task execution.
- Ranked 7th out of 24 teams.

DARPA SI3-CMD: Serial Interactions in Imperfect Information Games for Complex Military Decision Making*Researcher*

Jan. 2019 - Aug. 2020

Worcester, MA, USA

- Partnered with Scientific Systems Company Inc. (SSCI) to develop a game-theoretic framework and Python software for deceptive planning.
- Increased objective-achievement likelihood by leveraging asymmetric information and strategic deception.
- Formulated a solution concept for dynamic hypergames with temporal objectives.

Optimal Control and Reinforcement Learning for Stochastic Systems under Temporal Logic Specifications*Researcher*

Aug. 2016 - Aug. 2022

Worcester, MA, USA

- Developed a principled framework translating probabilistic temporal logic specifications into chance-constrained control problems with satisfaction guarantees.
- Proposed a scalable, model-free reinforcement learning approach for continuous stochastic systems with improved sample efficiency.

HONORS & AWARDS

Alex F. Backlin Fund Scholarship*Worcester Polytechnic Institute*

Jan. 2021

Worcester, MA, USA

Travel Grant Award*Lehigh University*

Oct. 2019

Bethlehem, PA, USA

Graduate Student Travel Award*Worcester Polytechnic Institute*

Oct. 2019

Worcester, MA, USA

Graduate Student Travel Award*Worcester Polytechnic Institute*

Mar. 2019

Worcester, MA, USA

Graduate Student Travel Award*Worcester Polytechnic Institute*

Jun. 2017

Worcester, MA, USA

EXTRACURRICULAR ACTIVITIES AND LEADERSHIP

President*Graduate Student Government (GSG)*

Jan. 2019 - May 2020

Worcester, MA, USA

- Oversaw governance operations and led the governing body.
- Represented graduate students in day-to-day interactions with university administration.
- Partnered with the Graduate Studies Office to elevate housing concerns to the Board of Trustees.
- Served on the Provost Search Committee and provided recommendations.

Volunteer*Lhasa Welfare Center for Children*

Jul. 2013 - Sep. 2013

China

- Raised funds to support educational services for children from low-income families.
- Tutored children in Chinese, Math, and English.

ORGANIZATION MEMBERSHIPS

- **Member**, IEEE
- **Member**, IEEE Young Professionals
- **Member**, IEEE Robotics and Automation Society
- **Member**, Association for Women in Mathematics
- **Member**, Alpha Chapter of Rho Beta Epsilon (Honor society) at Worcester Polytechnic Institute

SOCIAL MEDIA

LinkedIn: <https://www.linkedin.com/in/lening-li/>**Profile:** <https://lening.li>**GitHub:** <https://github.com/leelening>**Google Scholar:** <https://scholar.google.com/citations?user=KWUJ10wAAAAJ\&hl=en>**ACADEMIC SERVICES**

Journal Reviewer

- IEEE Robotics and Automation Letters (RA-L)
- IET Cyber-Systems and Robotics
- IEEE Transactions on Intelligent Transportation Systems
- Discover Robotics
- The Journal of Supercomputing

Conference Reviewer

- International Conference on Robotics and Automation (ICRA)
- American Control Conference (ACC)
- IEEE Conference on Decision and Control (CDC)
- IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)
- International Conference on Ubiquitous Robots (UR)
- European Control Conference (ECC)

PUBLICATIONS

Manuscripts in Preparation

- U.1 **L. Li** and Z. Qian, "Topological guided actor-critic modular learning of continuous systems with temporal objectives," *arXiv preprint arXiv:2304.10041*, 2023

- U.2 **L. Li** and J. Fu, “Policy synthesis for metric interval temporal logic with probabilistic distributions,” *arXiv preprint arXiv:2105.04593*, 2021

Conferences

- C.1 C. G. Atkeson, B. P. W. Babu, N. Banerjee, D. Berenson, C. P. Bove, X. Cui, M. DeDonato, R. Du, **L. Li**, P. Franklin, *et al.*, “No falls, no resets: Reliable humanoid behavior in the darpa robotics challenge,” in *2015 IEEE-RAS 15th International Conference on Humanoid Robots (Humanoids)*, pp. 623–630, IEEE, 2015
- C.2 **L. Li**, X. Long, and M. A. Gennert, “Birrtopt: A combined sampling and optimizing motion planner for humanoid robots,” in *2016 IEEE-RAS 16th International Conference on Humanoid Robots (Humanoids)*, pp. 469–476, IEEE, 2016
- C.3 **L. Li** and J. Fu, “Sampling-based approximate optimal temporal logic planning,” in *2017 IEEE International Conference on Robotics and Automation (ICRA)*, pp. 1328–1335, IEEE, 2017
- C.4 **L. Li** and J. Fu, “Topological approximate dynamic programming under temporal logic constraints,” in *2019 IEEE 58th Conference on Decision and Control (CDC)*, pp. 5330–5337, IEEE, 2019
- C.5 **L. Li** and J. Fu, “Approximate dynamic programming with probabilistic temporal logic constraints,” in *2019 American Control Conference (ACC)*, pp. 1696–1703, IEEE, 2019
- C.6 **L. Li**, H. Ma, S. Han, and J. Fu, “Synthesis of proactive sensor placement in probabilistic attack graphs,” in *2023 American Control Conference (ACC)*, pp. 3415–3421, IEEE, 2023
- C.7 **L. Li**, H. Rahmani, and J. Fu, “Probabilistic planning with prioritized preferences over temporal logic objectives,” in *32nd International Joint Conference on Artificial Intelligence*, 2023(Acceptance rate: **15%**)

Journals

- J.1 M. DeDonato, F. Polido, K. Knoedler, B. P. Babu, N. Banerjee, C. P. Bove, **L. Li**, R. Du, P. Franklin, J. P. Graff, *et al.*, “Team wpi-cmu: Achieving reliable humanoid behavior in the darpa robotics challenge,” *Journal of Field Robotics*, vol. 34, no. 2, pp. 381–399, 2017
- J.2 Z. Chen, **L. Li**, and X. Huang, “Building an autonomous lane keeping simulator using real-world data and end-to-end learning,” *IEEE Intelligent Transportation Systems Magazine*, vol. 12, no. 1, pp. 47–59, 2018
- J.3 **L. Li**, H. Ma, A. N. Kulkarni, and J. Fu, “Dynamic hypergames for synthesis of deceptive strategies with temporal logic objectives,” *IEEE Transactions on Automation Science and Engineering*, 2022

Chapters

- Ch.1 C. G. Atkeson, P. B. Benzun, N. Banerjee, D. Berenson, C. P. Bove, X. Cui, M. DeDonato, R. Du, **L. Li**, P. Franklin, *et al.*, “Achieving reliable humanoid robot operations in the darpa robotics challenge: Team wpi-cmu’s approach,” in *The DARPA Robotics Challenge Finals: Humanoid Robots To The Rescue*, pp. 271–307, Springer, 2018
- Ch.2 C. G. Atkeson, P. B. Benzun, N. Banerjee, D. Berenson, C. P. Bove, X. Cui, M. DeDonato, R. Du, **L. Li**, P. Franklin, *et al.*, “What happened at the darpa robotics challenge finals,” in *The DARPA Robotics Challenge Finals: Humanoid Robots To The Rescue*, pp. 667–684, Springer, 2018