

# Lening Li

Wayland, MA 01778, USA

+1 (774) 823 2639 ◊ leningli@outlook.com

## RESEARCH INTERESTS

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Reinforcement Learning ◊ Optimal Control ◊ Game Theory ◊ Formal Methods

## EDUCATION

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### Worcester Polytechnic Institute (WPI)

*Ph.D. in Robotics Engineering*

Worcester, MA, USA

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

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### 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

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### 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.

<b>Senior Software Engineer</b> <i>Symbotic</i>	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.	
<b>Senior Software Engineer</b> <i>Berkshire Grey</i>	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.	
<b>Software Engineering Intern</b> <i>Rudolph Technologies</i>	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.	
<b>Software Engineering Intern</b> <i>Neusoft</i>	Jul. 2013 - Aug. 2013 China
◦ Built a map management system supporting streamlined insert, delete, and edit operations.	

## REPRESENTATIVE SKILLS

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

## TEACHING

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<b>Teaching Assistant</b> <i>RBE 549. Computer Vision, WPI</i>	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: <a href="https://nitinjsanket.github.io/teaching/rbe549/fall2022.html">https://nitinjsanket.github.io/teaching/rbe549/fall2022.html</a>	
<b>Teaching Assistant</b> <i>RBE 3001 &amp; 3002. Unified Robotics III &amp; IV, WPI</i>	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.	
<b>Teaching Assistant</b> <i>RBE 549. Computer Vision, WPI</i>	Aug. 2018 - Dec. 2018 Worcester, MA, USA
◦ Delivered lectures and held office hours to support student learning and project execution.	

<b>Teaching Assistant</b> <i>RBE 1001. Introduction to Robotics, WPI</i>	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

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<b>DARPA Robotics Challenge</b> <i>Researcher</i>	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.	
<b>DARPA SI3-CMD: Serial Interactions in Imperfect Information Games for Complex Military Decision Making</b> <i>Researcher</i>	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.	
<b>Optimal Control and Reinforcement Learning for Stochastic Systems under Temporal Logic Specifications</b> <i>Researcher</i>	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

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<b>Alex F. Backlin Fund Scholarship</b> <i>Worcester Polytechnic Institute</i>	Jan. 2021 Worcester, MA, USA
<b>Travel Grant Award</b> <i>Lehigh University</i>	
<b>Graduate Student Travel Award</b> <i>Worcester Polytechnic Institute</i>	Oct. 2019 Bethlehem, PA, USA
<b>Graduate Student Travel Award</b> <i>Worcester Polytechnic Institute</i>	
<b>Graduate Student Travel Award</b> <i>Worcester Polytechnic Institute</i>	Mar. 2019 Worcester, MA, USA
<b>Graduate Student Travel Award</b> <i>Worcester Polytechnic Institute</i>	
<b>Graduate Student Travel Award</b> <i>Worcester Polytechnic Institute</i>	Jun. 2017 Worcester, MA, USA

## EXTRACURRICULAR ACTIVITIES AND LEADERSHIP

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<b>President</b>	Jan. 2019 - May 2020
<i>Graduate Student Government (GSG)</i>	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.

<b>Volunteer</b>	Jul. 2013 - Sep. 2013
<i>Lhasa Welfare Center for Children</i>	China

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

## ORGANIZATION MEMBERSHIPS

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- 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

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<b>LinkedIn:</b>	<a href="https://www.linkedin.com/in/lening-li/">https://www.linkedin.com/in/lening-li/</a>
<b>Profile:</b>	<a href="https://lening.li">https://lening.li</a>
<b>GitHub:</b>	<a href="https://github.com/leelening">https://github.com/leelening</a>
<b>Google Scholar:</b>	<a href="https://scholar.google.com/citations?user=KWUJ10wAAAAJ&amp;hl=en">https://scholar.google.com/citations?user=KWUJ10wAAAAJ&amp;hl=en</a>

## ACADEMIC SERVICES

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### 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

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### 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