LENING LI

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RESEARCH INTERESTS

Reinforcement Learning · Stochastic Optimal Control · Game Theory · Formal Methods

EDUCATION

Ph.D. Candidate in Robotics Engineering Jun. 2016 - Aug. 2021 (Exp.)
Worcester Polytechnic Institute (WPI) Worcester, MA, USA
Overall GPA: **3.89/4.0**

M.S. in Robotics Engineering in Computer Science Aug. 2014 - May 2016
Worcester Polytechnic Institute (WPI) Worcester, MA, USA
Overall GPA: **3.64/4.0**

B.S. in Computer Science & B.A. in English Language and Literature Sep. 2010 - Jul. 2014
Harbin Institute of Technology (HIT) China
Overall GPA: 85/100 (**Top 10%**)

Certification in College Teaching Jun. 2017 - Aug. 2019
Higher Education Consortium of Central Massachusetts (HECCMA) Worcester, MA, USA
Professional training on the teaching methods for providing high-quality courses.

Certification in Fundamentals of Website Development Jun. 2015 - Aug. 2015
Harvard University Cambridge, MA, USA
Course covering ideology and methodology of website development, including CSS, HTML, JavaScript.

RESEARCH EXPERIENCE

Research Assistant Jan. 2019 - Aug. 2020
Control and Intelligent Robotics Lab (CIRL), WPI *Worcester, MA, USA*

· Collaborated with Scientific Systems Company Inc (SSCI) on the *Serial Interactions in Imperfect Information Games Applied to Complex Military Decision Making (SI3-CMD).*
· Developed a generic framework for deceptive planning.
· Achieved a higher probability of completing objectives by using asymmetrical information.

Research Assistant Aug. 2016 - Aug. 2017
Control and Intelligent Robotics Lab (CIRL), WPI *Worcester, MA, USA*

· Researched Reinforcement Learning with Temporal Logic Constraints.
· Proposed a new sampling-based reinforcement learning algorithm with neural network function approximator implemented in PyTorch.
· Addressed the sparse reward issue in probabilistic planning for a stochastic dynamic system with partial observation.

TEACHING EXPERIENCE

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

· Led 3D-printed robot arm control lab and mobile robot navigation lab.
· Designed and evaluated students' final projects, lab reports, and homework assignments.

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

· Conducted a lecture on image filtering.
· Led office hours to assist students in understanding course material and with homework difficulties.

Teaching Assistant Aug. 2017 - May 2018
RBE 1001. Introduction to Robotics, WPI *Worcester, MA, USA*

· Supervised a team of 5 undergraduate peer learning assistants.
· Mentored students and evaluated final projects, lab reports, and homework assignments.

INDUSTRY EXPERIENCE

Software Engineering Contractor Aug. 2015 - Jan. 2016
Rudolph Technologies *Tewksbury, MA, USA*

· Improved the code quality of a system that collects data from wafers.
· Analyzed and visualized data to help customers with improving CPU production.

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

· Developed an automated tool for migrating codebase from multiple version control systems to a unified system.

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

· Developed a map management system.
· Optimized the efficiency of inserting, deleting, editing operations over maps.

PUBLICATIONS

Under review

U 1: L. Li, H. Ma, A. N. Kulkarni, and J. Fu, "Dynamic hypergames for synthesis of deceptive strategies with temporal logic objectives," *arXiv preprint arXiv:2007.15726*, 2020

Conference

C 1: 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 2: 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 3: L. Li and J. Fu, "Sampling-based approximate optimal temporal logic planning," in *Robotics and Automation (ICRA), 2017 IEEE International Conference on*, pp. 1328–1335, IEEE, 2017

C 4: 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 5: C. G. Atkeson, B. P. W. Babu, N. Banerjee, D. Berenson, C. P. Bove, X. Cui, M. DeDonato, R. Du, S. Feng, P. Franklin, *et al.*, "No falls, no resets: Reliable humanoid behavior in the darpa robotics challenge," in *Humanoid Robots (Humanoids), 2015 IEEE-RAS 15th International Conference on*, pp. 623–630, IEEE, 2015

Journal

J 1: 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 2: M. DeDonato, F. Polido, K. Knoedler, B. P. Babu, N. Banerjee, C. P. Bove, X. Cui, 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 3: C. G. Atkeson, B. Babu, N. Banerjee, D. Berenson, C. Bove, X. Cui, M. DeDonato, R. Du, S. Feng, P. Franklin, *et al.*, "What happened at the darpa robotics challenge, and why," *submitted to the DRC Finals Special Issue of the Journal of Field Robotics*, vol. 1, 2016

Book

B 1: C. G. Atkeson, P. B. Benzun, N. Banerjee, D. Berenson, C. P. Bove, X. Cui, M. DeDonato, R. Du, S. Feng, P. Franklin, *et al.*, "Achieving reliable humanoid robot operations in the darpa robotics challenge: Team wpi-cmus approach," in *The DARPA Robotics Challenge Finals: Humanoid Robots To The Rescue*, pp. 271–307, Springer, 2018

B 2: C. G. Atkeson, P. B. Benzun, N. Banerjee, D. Berenson, C. P. Bove, X. Cui, M. DeDonato, R. Du, S. Feng, 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

Thesis

T 1: L. Li, *Birrtopt: A combined software framework for motion planning applied on atlas robot.* Master's thesis, Worcester Polytechnic Institute, 2016

T 2: L. Li, *Contourlet Transform Based Image Compression.* Bachelor's thesis, Harbin Institute of Technology, 2014

T 3: L. Li, *A Study on the Male Chauvinism in "Women in Love".* Bachelor's thesis, Harbin Institute of Technology, 2014

PRESENTATIONS

- **Topological approximate dynamic programming under temporal logic constraints.** Poster Presentation, Northeast Robotics Colloquium (NERC), 2019.
- **Topological approximate dynamic programming under temporal logic constraints.** Poster Presentation, Robot Learning Workshop, 2019.
- **Approximate dynamic programming with probabilistic temporal logic constraints**, Paper Presentation, American Control Conference (ACC), 2019.
- **Sampling-based approximate optimal temporal logic planning**, Paper Presentation, IEEE International Conference on Robotics and Automation (ICRA), 2017

- **Birrtopt: A combined sampling and optimizing motion planner for humanoid robots**
  Poster Presentation, International Conference on Humanoid Robots (Humanoids), 2016.
- **Birrtopt: A combined sampling and optimizing motion planner for humanoid robots**
  Paper Presentation, Northeast Robotics Colloquium (NERC), 2016.

HONORS & AWARDS

Summa Cum Laude Jul. 2014
Harbin Institute of Technology China

Travel Grant Award, $250 Oct. 2019
Lehigh University Bethlehem, PA, USA

Graduate Student Travel Award, $500 Oct. 2019
Worcester Polytechnic Institute Worcester, MA, USA

Graduate Student Travel Award, $400 Mar. 2019
Worcester Polytechnic Institute Worcester, MA, USA

Graduate Student Travel Award, $1000 Jun. 2017
Worcester Polytechnic Institute Worcester, MA, USA

EXTRACURRICULAR ACTIVITIES

President Jan. 2019 - May 2020
Graduate Student Government (GSG) *Worcester, MA, USA*

· Supervised the GSG governing body.
· Presented on behalf of the GSG to the university administration.
· Collaborated with Graduate Studies Office to raise awareness of housing issues to Board of Trustees.
· Chaired provost search committee and made recommendations.

Volunteer Teacher Jul. 2013 - Sep. 2013
Lhasa Welfare Center for Children *China*

· Fundraised for providing educational services to children from low-income families.
· Volunteered to educate children across different subjects, including Chinese, Math, and English.

EDITORIAL ACTIVITIES

Journal Reviewer

- IEEE Control Systems Letters (L-CSS).

Conference Reviewer

- International Conference on Robotics and Automation (ICRA) 2017 2021.
- American Control Conference (ACC), 2019 2021
- IEEE Conference on Decision and Control (CDC), 2018 2019 2020
- IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2020
- International Conference on Ubiquitous Robots (UR), 2020

LANGUAGE PROFICIENCY

- **Chinese**, Native
- **English**, Fluent

SKILLS

Programming	C/C++, Python, MATLAB, Java, SQL, Assembly Language, LaTex, HTML
Robotic Tools	ROS, RVIZ, Gazebo, Open Rave
Software	PyTorch, Git, Vim, PowerBuilder
Others	Ubuntu, VS Code, QtCreator, MFC, Perforce, Verilog

ORGANIZATION MEMBERSHIPS

- **Member**, IEEE
- **Member**, IEEE Young Professionals
- **Member**, IEEE Robotics and Automation Society
- **Member**, Association for Women in Mathematics