JESSICA EN SHIUAN LEU

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EDUCATION

University of California, Berkeley *Berkeley, CA*
Ph.D. in Mechanical Engineering (Robotics, Motion Planning, Controls) *Aug. 2017 - May 2022*

- Academic advisor: Prof. Masayoshi Tomizuka
- Dissertation title:
  Designing Integrated Strategies for Modularized Robotic Systems in Uncertain Environments
- Dissertation committee:
  Prof. Masayoshi Tomizuka (Chair), Prof. Francesco Borrelli, and Prof. Claire Tomlin

National Taiwan University (NTU), Taipei, Taiwan *Sep. 2013 - Jun. 2017*
Bachelor of Science, Mechanical Engineering
School Year cumulative ranking in class: 1^{st}/205 (GPA : 4.22/4.3)

WORK EXPERIENCES

Applied Scientist II at Amazon Robotics North Reading, MA
Robotics, Manipulation, Motion planning Aug. 2022 - Present

Research Intern at Mitsubishi Electric Research Laboratories Cambridge, MA
Host: Yebin Wang Jan. 2021 - May. 2021, Sep. 2021 - Dec. 2021

Advanced Robotics Eng. Intern at Amazon Robotics North Reading, MA
Manager: Yuri Ivanov May. 2021 - Aug. 2021

RESEARCH INTERESTS

Robotics, human robot interactions, control and motion planning, optimization and optimal control, exoskeleton and mechanical design.

SELECTED RESEARCH PROJECTS

University of California, Berkeley Berkeley, CA
Graduate Student Researcher Aug. 2017 - May 2022

- **Robot Motion Planning** *Aug. 2018 - May 2022*
  These works present benchmarks which implement and compare existing planning algorithms on a variety of problems. Based on the benchmarking results, we propose hybrid planning algorithms, RRT*-CFS and RRT*-sOpt that combine the merits of sampling-based, optimization-based, and trajectory segmentation methods. A motion planner utilizing the improved A-search guided tree is developed for complex kinematic system such as a tractor-trailer system.
- **Integrated Robotic Systems** *Aug. 2019 - May 2022*
  Integrated robotic systems are developed for settings such as an electronic assembly line with human-robot interaction and a dynamic parking environment with moving obstacles. The multi-module system performs prediction, decision-making, and planning to complete a task while ensuring safety and efficiency.
- **Mitten Prosthesis for Spinal Cord Injury (SCI) Subjects** *Aug. 2018 - Oct. 2019*
  A novel orthotic is designed to improve hand functionality for individuals with cervical SCI. This device utilizes a slim dorsal leaf spring and underactuated cable drive to passively open and actively

close the hand, while ensuring ease of donning and doffing.

National Taiwan University (NTU) Taipei, Taiwan
Undergraduate Student Researcher Sep. 2015 - Jun. 2017

- **Walking Strategy for Biped Robots with Artificial Muscles** *Sep. 2015 - Jun. 2017*
  This work uses pressure sensors to detect the connect surface profile and improve the compatibility of the biped.
- **Pneumatic tube Capsule Opening Device in Hospitals** *Jan. 2017 - Jun. 2017*
  A pneumatic capsule opening device is developed and installed in a hospital medical laboratory.

PUBLICATIONS

1. J. Leu, Y. Wang, M. Tomizuka, and S. Di Cairano, "Improved a-search guided tree for autonomous trailer planning," in *2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. IEEE, 2022, pp. 7190–7196
2. J. Leu, Y. Cheng, M. Tomizuka, and C. Liu, "Robust task planning for assembly lines with human-robot collaboration," in *Proceedings of the International Symposium on Flexible Automation 2022 International Symposium on Flexible Automation*. The Institute of Systems, Control and Information Engineers, 2022, pp. 188–195
3. J. Leu, M. Wang, and M. Tomizuka, "Long-horizon motion planning via sampling and segmented trajectory optimization," in *2022 European Control Conference (ECC)*. IEEE, 2022, pp. 538–545
4. J. Leu, Y. Wang, M. Tomizuka, and S. Di Cairano, "Autonomous vehicle parking in dynamic environments: An integrated system with prediction and motion planning," in *2022 International Conference on Robotics and Automation (ICRA)*. IEEE, 2022, pp. 10 890–10 897
5. **J. Leu**, G. Zhang, L. Sun, and M. Tomizuka, "Efficient robot motion planning via sampling and optimization," in *2021 American Control Conference (ACC)*. IEEE, 2021, pp. 4196–4202
6. **J. Leu**, R. Lim, and M. Tomizuka, "Safe and coordinated hierarchical receding horizon control for mobile manipulators," in *2020 American Control Conference (ACC)*. IEEE, 2020, pp. 2143–2149
7. **J. Leu** and M. Tomizuka, "Motion planning for industrial mobile robots with closed-loop stability enhanced prediction," in *Dynamic Systems and Control Conference*, vol. 59162. American Society of Mechanical Engineers, 2019, p. V003T19A009
8. D. Kaneishi, **J. Leu**, J. O'Donnell, C. Affleck, R. P. Matthew, A. McPherson, M. Tomizuka, and H. S. Stuart, "Design and assessment of a single-size semi-soft assistive mitten for people with cervical spinal cord injuries," in *2019 IEEE-RAS 19th International Conference on Humanoid Robots (Humanoids)*. IEEE, 2019, pp. 614–621
9. D. Kaneishi, R. P. Matthew, **J. Leu**, J. O'Donnell, B. Zhang, M. Tomizuka, and H. Stuart, "Hybrid control interface of a semi-soft assistive glove for people with spinal cord injuries," in *2019 IEEE 16th International Conference on Rehabilitation Robotics (ICORR)*. IEEE, 2019, pp. 132–138
10. **J. Leu**, S.-T. Liu, Y.-H. Chen, and W.-P. Shih, "Development of a humanoid robot foot with distributive force sensors," in *2017 3rd International Conference on Control, Automation and Robotics (ICCAR)*. IEEE, 2017, pp. 134–137

TECHNICAL STRENGTHS

Software & Tools	Matlab, C++ , Python, Linux, ROS, LabVIEW, SolidWorks, COMSOL
Language skills	Mandarin Chinese (native), English, Japanese