Jee-Eun Lee, PhD Candidate

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Education

2019 – 2025 **Ph.D., University of Texas at Austin** in Aerospace Engineering and Engineering Mechanics.
Advisor: Dr. Luis Sentis
Dissertation: *Optimization Approaches for High-Performance and Efficient Redundancy Utilization in Robotic Systems*.

2012 – 2014 **M.S., Seoul National University** in Mechanical and Aerospace Engineering.
Advisor: Dr. Frank Chongwoo Park
Thesis: *(The) role of attention in the generation of human and robot arm movements*.

2009 – 2012 **B.S., Seoul National University** in Mechanical and Aerospace Engineering.
graduated Cum Laude (18th/176) in 3.5 years.

Industry Experience

2023 – · · · · **Robotics Intern,** Dexterity Inc., Redwood City, CA, USA
Worked on:
- Smooth time-optimal path tracking algorithm
- Grasp stability constraint modeling and analysis
- Hardware-accelerated trajectory optimization,. etc.

2015 – 2018 **Motion Software Engineer,** Samsung Electronics, Suwon, South Korea
Worked on:
- Smooth motion velocity profile / CP motion
- Dynamics applied acceleration assign algorithm
- Singularity avoidance
- Force control(admittance control)
- Precise calibration algorithm for robot body
- Hand-eye calibration algorithm,. etc.

Academic Experience

2019 – · · · · **Graduate Researcher.** HCRL Lab, UT Austin, Austin, TX, USA.
- Adaptive Whole Body Control for Robot Climbing in Unknown Structure
- Symmetry-Aware Dynamics Model for Robotic Learning
- Smooth and Time-optimal Trajectory Generation for Industrial Manipulators
- GPU-Accelerated Trajectory Optimization

2022 – 2022 **Visiting Student.** Data61, CSIRO, Brisbane, Queensland, Australia.
- Motion and Control Strategy for Magneto: Climbing Quadruped with Electromagnet

2018 – 2019 **Robotic Researcher,** DYROS Lab, SNU, Suwon, South Korea.
- SLAM for Humanoid Robot

2012 – 2014 **Graduate Researcher.** Robotics Lab, SNU, Seoul, South Korea.
- Human-like Motion Generation (Master's thesis)
- Motion Intention Recognition for Exoskeleton

Research Publications

Journal Articles

1. **J.-E. Lee**, R. Sun, A. Bylard, and L. Sentis, "Grasp failure constraints for fast and reliable pick-and-place using multi-suction-cup grippers," *arXiv preprint arXiv:2408.03498*, 2024.
2. M. K. Shin, H. Qian, **J.-E. Lee**, L. Sentis, and S. I. Maberti, "Estimating exposures from spray products using robotic simulations," *Annals of Work Exposures and Health*, vol. 67, no. 8, pp. 979–989, 2023.
3. **J.-E. Lee**, T. Bandyopadhyay, and L. Sentis, "Adaptive robot climbing with magnetic feet in unknown slippery structure," *Frontiers in Robotics and AI*, vol. 9, p. 949 460, 2022.
4. C. Jang, **J.-E. Lee**, S. Lee, and F. C. Park, "A minimum attention control law for ball catching," *Bioinspiration & Biomimetics*, vol. 10, no. 5, p. 055 008, 2015.

Conference Proceedings

1. **J.-E. Lee**, A. Bylard, R. Sun, and L. Sentis, "On the performance of jerk-constrained time-optimal trajectory planning for industrial manipulators," in *IEEE International Conference on Robotics and Automation, ICRA 2024, Yokohama, Japan, May 13-17, 2024*, IEEE, 2024, pp. 9772–9778. DOI: 10.1109/ICRA57147.2024.10610437.
2. **J.-E. Lee**, J. Lee, T. Bandyopadhyay, and L. Sentis, "Sample efficient dynamics learning for symmetrical legged robots: Leveraging physics invariance and geometric symmetries," in *IEEE International Conference on Robotics and Automation, ICRA 2023, London, UK, May 29 - June 2, 2023*, IEEE, 2023, pp. 2995–3001. DOI: 10.1109/ICRA48891.2023.10160959.
3. T. Bandyopadhyay, R. Bowyer, J. Oestrich, *et al.*, "In-situ foothold evaluation for a magnetic climbing robot.," in *Australasian Conference on Robotics and Automation, Melbourne, Australia.*, CSIRO, 2021.
4. **J.-E. Lee** and J. Park, "Kinematic parameter calibration for humanoid robot using relative pose measurement in walking motion," in *2019 16th International Conference on Ubiquitous Robots (UR)*, IEEE, 2019, pp. 712–717.
5. C. Jang, **J.-E. Lee**, S. Lee, and F. C. Park, "A minimum attention control law for ball catching," in *Biomimetic and Biohybrid Systems - Third International Conference, Living Machines 2014, Milan, Italy, July 30 - August 1, 2014. Proceedings*, A. Duff, N. F. Lepora, A. Mura, T. J. Prescott, and P. F. M. J. Verschure, Eds., ser. Lecture Notes in Computer Science, vol. 8608, Springer, 2014, pp. 154–165. DOI: 10.1007/978-3-319-09435-9_14.

Skills

Background Knowledge	Trajectory Optimization, Robot Kinematics and Dynamics, Deep Learning, Graph Neural Network, Permutation Equivariant Network, Reinforcement Learning, Machine Learning Algorithms for Recognition and Vision System, Parallel Programming, etc.
Coding Languages	C/C++, CUDA C++, Python, and Matlab.
Build / Code Management Tools	CMake, Bazel, and Poetry.
Open Sources	ROS, Mujoco, Pybullet, Dart(Physics Engine), TensorFlow, Pytorch, Stable-Baselines3(RL), Cublas, etc.

References

Available on Request