Leonard Jung

29 Lambert St, Apt 8, Boston, MA
206-397-5730 | jung.le@northeastern.edu

Research Interests

Verifiable Machine Learning, Safe Robotics, Contingency Planning, Sampling-based MPC, Riemannian Optimization, Factor Graph Optimization, Large-Scale SLAM

Education

- **2023–2028:** PhD Candidate, ECE – Institute for Experiential Robotics, Northeastern University, Boston, MA
- **2020–2023:** B.S. Aeronautical and Astronautical Engineering, Purdue University, West Lafayette, IN (GPA 3.89/4.0)
  - Purdue Aerial Robotics Team (Autonomy Lead); Purdue Orbital (GNC Lead); Lockheed Martin Design Award

Publications

Under Review

Estornell, A., **Jung**, **L.**, & Everett, M. (2025). Verification of visual controllers via compositional geometric transformations. *arXiv preprint arXiv:2507.04523*.

Jung, **L.**, Papalia, A., Doherty, K., & Everett, M. (2025). Practical and performant enhancements for maximization of algebraic connectivity. *arXiv preprint arXiv:2511.08694*.

Accepted

Estornell*, A., **Jung***, **L.**, Spiro*, A., Sznaier, M., & Everett, M. (2025). A hybrid framework for efficient koopman operator learning. *arXiv preprint arXiv:2504.18676*.

Presented

Dong, Z., Papalia, A., **Jung**, **L.**, Spiro, A., Osteen, P. R., Robison, C. S., & Everett, M. (2025). Learning smooth state-dependent traversability from dense point clouds. *RSS 2025 Workshop on Resilient Off-road Autonomous Robotics*. https://openreview.net/forum?id=icCwJjkjCf

Dong, Z., Pflueger, J., **Jung**, **L.**, Thorne, D., Osteen, P. R., Robison, C. S., Lopez, B. T., & Everett, M. (2025). Lidar inertial odometry and mapping using learned registration-relevant features. *2025 IEEE International Conference on Robotics and Automation (ICRA)*, 359–366. https://doi.org/10.1109/ICRA55743.2025.11127666

Jung, **L.**, Estornell, A., & Everett, M. (2025). Contingency constrained planning with mppi within mppi. *7th Annual Learning for Dynamics\& Control Conference*, 869–880.

Tanaka, Y., Anibha, A. A., **Jung**, **L.**, Gul, R., Sun, J., & Dai, R. (2023). An origami-inspired deployable space debris collector. *2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 10757–10762.

* — equal contribution

Awards

- **2023:** AJC Graduate Student Research Fellow

Relevant Coursework/Projects

- Verifiable Machine learning
  - Project: Forward Reachability for Verifying Neural Control Barrier Functions
- Large Language Agents
  - Project: Large Language Model Agent for Hyperparameter Optimization
- Sparsity in Optimization and Controls
  - Project: Sparse Actuator Control of a Multi-Modal Aerial Legged Robot

Work Experience

- **2023:** GNC Intern, AeroVironment
  - Developed guidance, control, and estimation algorithms for multiple autonomous vehicle platforms.
  - Extended CI/CD infrastructure through containerization.
- **2022:** Research Intern, UF Autonomous Vehicles Lab
  - Implemented differentially flat minimum-snap trajectory planning for smooth quadcopter flight.
  - Integrated EKF onto custom quadcopter platform for GPS-denied navigation.
  - Implemented path-planning algorithms for obstacle avoidance.
- **2021:** AFRL LEGACY SURE Intern, Air Force Research Laboratory
  - Designed a quadcopter model to test attitude controllers.
  - Implemented optimal gain matrix solver for LQR controllers.
  - Created LQR attitude controller for multi-copter flight.
- **2019:** Summer Development Program, The Boeing Company
  - Programmed and tested mathematics library for the 737 MAX using JavaScript and CoffeeScript.
  - Improved airplane health reporting metrics and worked in an Agile development environment.

Skills

Software: JAX, Pytorch, Acados, Casadi, ROS 1 & 2, Gazebo, Issac Sim, Docker