Janice Lee

412-933-9254 | janice.seungyeon@gmail.com | linkedin.com/in/janice-lee- | janicesylee.github.io/

Education

Carnegie Mellon University Aug. 2023 – Dec. 2024

School of Computer Science *Pittsburgh, PA*

- Masters of Science in Robotics GPA: 4.07/4.3
- **Thesis**: Autonomous Sensor Insertion and Exchange for Cornstalk Monitoring Robot
- **Relevant Coursework**: Mathematical Fundamentals for Robotics, Graduate Artificial Intelligence, Optimal Control and Reinforcement Learning, Introduction to Robot Learning, Planning and Decision-making in Robotics

Carnegie Mellon University Aug. 2019 – May 2023

College of Engineering *Pittsburgh, PA*

- Bachelor of Science in Mechanical Engineering & Double Major in Robotics GPA: 3.80/4.00
- **Relevant Coursework**: Computer Vision, Feedback Control Systems, Robot Kinematics and Dynamics, Mobile Robot Algorithms Laboratory, Robotics Systems Engineering, Robotics Capstone

Publications

J. S. Lee, T. Detlefsen, S. Lawande, S. Ghatge, S. R. Shanthi, S. Mukkamala, G. Kantor, and O. Kroemer, "Autonomous Sensor Exchange and Calibration for Cornstalk Nitrate Monitoring Robot", IEEE International Conference of Robotics and Automation (ICRA) (Under review), 2025

J. S. Lee, "Autonomous Sensor Insertion and Exchange for Cornstalk Monitoring Robot", Master's Thesis, 2024

S. Schaffer, **J. S. Lee**, L. Beni, V. A. Webster-Wood, "A Computational Approach for Contactless Muscle Force and Strain Estimations in Distributed Actuation Biohybrid Mesh Constructs", Living Machines, 2022

Research Experience

CMU Intelligent Autonomous Manipulation Lab Jan. 2023 – Present

Graduate Research Assistant *Supervisor: Prof. Oliver Kroemer and Prof. George Kantor*

- Designed and fabricated a compliant two-finger gripper for adaptive grasping and sensor insertion which improved the gripper insertion success rate by 17%
- Developed a cost-effective and reliable funneling mechanism for low precision manipulators that improved alignment precision and sensor exchange robustness by 76%
- Implemented visual servoing using Mask R-CNN for real-time dynamic alignment, reducing the median distance from the center by 38.2%
- Led system integration and field deployment of an autonomous robotic system for cornstalk nitrate monitoring and sensor exchange, which resulted in 22% increase in the overall sensor insertion success

CMU Biohybrid and Organic Robotics Group Aug. 2021 – May 2022

Undergratuate Research Assistant *Supervisor: Prof. Victoria Webster-Wood*

- Reverse engineered a CAD model of castable plate to grow biological muscle actuators for parametric design
- Characterized a biaxial stretcher to control desired displacements with the apparatus for experimental validation of the computational tools developed to estimate muscle actuator strains and forces

CMU Biorobotics Lab Aug. 2019 – May 2020

Undergratuate Research Assistant *Supervisor: Prof. Howie Choset*

- Designed a fish-like robot agent actuated with one-degree of freedom to study how a school of fish responds to the motion of its surrounding environment

Work Experience

Samsung Electronics Global Technology Research Jun. 2023 – Aug. 2023

Robotics Software Intern | Smart Factory Robotics Software Team *Suwon, South Korea*

- Designed a custom gripper mount and established Ethernet communication to integrate a Robotiq three-finger gripper with a Samsung 6 DOF industrial robotic arm used in manufacturing
- Developed user-friendly gripper motion control functions within the robot's control software, enabling seamless pick-and-place operations for objects of various shapes

Carnegie Mellon University Aug. 2022 – Dec. 2023

Teaching Assistant *Pittsburgh, PA*

- Mentored semester-long, student-led group projects in **Medical Robotics** (Fall 23), supporting the design and development of novel medical robots and conducting weekly office hours
- Facilitated weekly office hours, managed four student graders, assisted with homework, and supervised group projects focused on designing and developing assistive products in **Mechanical Design: Methods and Applications** (Fall 22 - Spring 23)

Smith + Nephew Medical Robotics Jun. 2022 – Aug. 2022

Robotics R&D Intern | Robotics Product Support Team *Pittsburgh, PA*

- Developed a high potential test fixture and an electrical continuity test fixture to enhance safety and robustness of handheld robotic surgical tool used for knee and hip surgery arthroplasty.
- Performed extensive testing of the handheld robotic surgical tool, including wood burring, pressure leakage, and key performance characteristics.

Academic Projects

Path Planning for Zoë2 Rover Fall 2024

Planning and Decision-making in Robotics *Carnegie Mellon University*

- Designed and implemented a path-planning algorithm for the Zoë2 research rover, optimizing navigation through lattice-based A* and RRT* planning methods
- Simulated planner performance in 2D and 3D environments using ROS2 and Gazebo, ensuring efficient and adaptable terrain navigation

Sentiment Analysis of Movie Reviews Spring 2024

Graduate Artificial Intelligence *Carnegie Mellon University*

- Implemented and compared Binary Linear Classifier, Neural Network, and Transformer models for IMDb sentiment analysis, achieving test accuracies of 86.7%, 84.7%, and 83.2%, respectively, under consistent training conditions
- Highlighted the efficiency of simpler models like Binary Linear Classifiers, achieving high accuracy with lower computational requirements compared to complex architectures

Food Distribution and Assembly Robot Fall 2022 – Spring 2023

Robot System Engineering & Robotics Capstone *Carnegie Mellon University*

- Engineered and developed a robotic system capable of receiving customer orders, relocating ingredients, and assembling meals for final serving
- Designed and built a bowl dispenser and conveyor belt mechanism to automate food dispensing

Awards

University Honors (Graduated with Distinction)	May 2023
Smith + Nephew Best Presenter of Annual Intern Poster Competition	Aug. 2022
Outstanding Project at CMU ECE Build18 Make-a-thon	Jan. 2021
College of Engineering Dean's List (GPA 3.75 and above)	Aug. 2020 - May 2022
CFCU Richard V.V. Stringham Scholarship	Aug. 2019 - May 2020

Skills & Interests

Design & Simulation: SolidWorks, Siemens NX, Autodesk Inventor, Onshape, ANSYS, Simulink

Programming: Python, MATLAB, ROS, Julia, C++, C, Arduino, LaTeX

Fabrication: Milling, Lathes, Drill Press, Band Saw, CNC Machining, 3D Printing, Laser Cuttering, Woodworking

Spoken Languages: English (Fluent), Korean (Fluent)