Jungjae Lee

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Portfolio | LinkedIn | Github | ResearchGate | Google Scholar

SKILLS

Language: C++, Python, MATLAB, XML, Verilog (w/ FPGA), C, HTML, CSS, Javascript, Java
Simulation & Design: ROS, SOFA, COMSOL, MuJoCo, CAD (Solidworks, Onshape), EDA (KiCad, EagleCAD)
Machinery: Soldering, 3D Printing, Heat Press, Milling, Lathes, Drill Press, Laser Cutter, Welding
Documentation & Management: git, GitHub Project, Notion, Google Doc, Microsoft Word, LaTex (Overleaf)

RESEARCH EXPERIENCES

Soft Robotics & Bionics Laboratory (Seoul National University College of Engineering) **Gwanak District, Seoul, KR**
Visiting Robotic Controls Researcher *May 2023 – November 2023 (In-person)*

- Design an Origami-inspired soft pneumatic actuator model using SOFA simulator, utilizing real-world data for accurate design simulations [5]
- Develop comprehensive simulation environment utilizing software on SOFA simulator, to enable UR5e robot to execute machine learning algorithms effectively and attain precise control of robotic arm [5]

Morphable Biorobotics Laboratory (Boston University College of Engineering) **Boston, MA, USA**
Biorobotics Undergraduate Researcher (Student Research Award Recipient) *January 2022 – May 2023 (In-person)*

- Integrated a custom Python code with an open-source library to manage data acquisition from an electromagnetic position tracking system and visualize workspace of a surgical soft robotic end effector
- Designed PCB using EagleCAD to control valves and pumps in an in-vitro setup that mimics cardiovascular system, enabling team to conduct testing on endovascular device [4]
- Molded silicone pneumatic actuators that provide reliable grips on abdominal organs during surgical procedures and conducted various strength tests, including blocked force and grip testing, to assess actuators' reliability [1, 2, 3]

Kolachalama Laboratory (Boston University School of Medicine) **Boston, MA, USA**
Computational Biomedicine Undergraduate Researcher *March 2023 – May 2023 (In-person)*

- Implemented software to integrate front-end and back-end servers, enhancing efficiency of machine learning models, and crafting corresponding Neurodegenerative Disease graphs for each position utilizing Python
- Developed an API connection between front-end and back-end using Python to enable retrieval of image input files and help implement Kidney Biopsy Image Segmentation algorithm created by Dr.Ahangaran

** All of my works are designated by numbers that correlate with papers in Publications sections. **

WORK EXPERIENCES

Republic of Korea Army (Defense Counterintelligence and Security Agency - 777th Intelligence Command) **Seoul, KR**
Electronic Warfare and Signals Intelligence Agent (SI Secret Level Clearance) *November 2023 – Present (In-person)*

- Engaged in various intelligence operations at Republic of Korea Army's 1st Corps Command Control Center.
- Operate electronic warfare equipment to intercept and collect intelligence through monitoring enemy's military communication networks, and perform tasks related to processing of gathered intelligence.

PUBLICATIONS

- L. Kinnicutt, **J. Lee**, et. al, "A Soft Laparoscopic Grasper for Retraction of the Small Intestine", Hamlyn Symposium on Medical Robotics, London, UK. June 2023. [1] (Conference, 2nd Author)
- L. Kinnicutt, **J. Lee**, et. al, "A Soft Robotic, Modular Laparoscopic Grasper for Atraumatic Retraction of the Small Intestine", Device, *Manuscript In Review.* [3] (Journal, Co-2nd Author)
- L. Kinnicutt, **J. Lee**, et. al, "Minimally Invasive Soft Robotic Prototypes Provide Variable Occlusion in a Simplified Aortic Flow Model", *Manuscript In Progress.* [4] (Journal)
- T. Hong, **J. Lee**, et. al, "Origami-inspired soft pneumatic actuator model on SOFA simulation", *Manuscript In Progress.* [5] (Journal, 2nd Author)

LEADERSHIP & EXTRACURRICULAR EXPERIENCES

Zero, Autonomous Vehicle (Seoul National University) **Gwanak District, Seoul, KR**
Control System Team Member *September 2023 – November 2023*

- Competition: 2023 International EV Competition at Korea Automobile Testing & Research Institute (3rd Place)
- Designed and implemented custom cover for camera to mitigate rain interference during competitions, ensuring uninterrupted functionality despite adverse weather conditions
- Developed GUI to remotely manage vehicle's navigation and monitor real-time location data from centralized control rooms during competition, which has been showcased to judges for demonstrating during missions
- Created comprehensive PowerPoint presentation for competition, showcasing team's advancement from previous year and elucidating ideation process and technical innovations

Mars Rover, Robotics (Boston University) **Boston, MA, USA**
Vice President | Safety Officer | Robotic Arm Hardware Team Member *September 2021 – May 2023*

- Oversaw team's social media, actively started LinkedIn page in 2022, gained 110+ followers in month through strategic engagement with university and small business outreach
- Collaborated with sub-team leaders to discuss projects, ensure every plan is on track, and mentor team with necessary tools to engage all members creatively and educationally and create better team community

Terrier Motorsport, Formula SAE (Boston University) **Boston, MA, USA**
Safety Officer | Social Media Coordinator | Electrical Team Member *September 2021 – August 2022*

- Supervised 80+ team members' safety, discussed with sub-team leaders how to improve safety, and checked vehicle components to ensure safety before submitting documentation for competition
- Proactively engaged with numerous companies and university to secure sponsorship and support, successfully secured substantial $20,000 in funding in 2022

PROJECTS

"Robotics End Effector," Mars Rover - Robotic Arm Hardware Team *December 2021 – April 2023*

- Designed first and second prototype of End Effector using Solidworks by carefully considering functionality and durability to ensure it works with other components and systems

"Image Data Visualization Interface using Machine Learning Algorithms" *October 2022 – December 2022*

- Designed user interface that allows users to input two labeled directories containing large amounts of image data and utilized machine learning algorithms to visualize average of two datasets

"Pokemon Game" *September 2022 – December 2022*

- Developed complex simulation of Pokemon battles in two-dimensional world with objects that move and interact in real time while implementing intuitive command system to enable users to control object behavior
- Designed software that utilizes inheritance, polymorphism, and Model-View-Controller pattern to create object behaviors through incorporation of object classes

"Tractive System Active Lamp," Terrier Motorsport - Electrical Team *September 2021 – March 2022*

- Engineered PCB board using KiCad, featuring red flashing lamp at 3Hz frequency that can be mounted above driver to indicate voltage power and be visible from all directions
- Conducted website simulation tests to evaluate effectiveness of four different circuit designs and determined most suitable design for optimal performance

EDUCATIONS

MITx (Massachusetts Institute of Technology edX Program | Instructor-paced | Audit) *Fall 2024*
Relevant Coursework: Machine Learning (6.86x)

Harvardx (Harvard University edX Program | Self-paced | Audit) *Summer 2024*
Relevant Coursework: Artificial Intelligence (CS50AI), Probability (STAT110x)

Coursera (w/ Certification) *Summer 2023*
Relevant Coursework: Essential Math Specialization (University of Colorado Boulder)

Boston University College of Engineering (Leave of Absence from 2023 - 2025 for military service) **Boston, MA, USA**
B.S. in Computer Engineering | Concentration in Machine Learning *Expected May 2027*
Relevant Coursework: Machine Learning, Algorithms and Data Structures, Software Engineering, Statistics