Curriculum Vitae

Jeonghyeon Lee

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Objective

I am Seeking a Ph.D. position in Robotics, specifically in the areas of Medical Robotics, Wearable robotics, and Supportive robots. I am highly motivated to solve real-world problems, particularly those related to medical or space applications. I have strong skills in collaborating with other people from different fields, including MDs.

Education

- **M.S. in Mechanical Engineering** *Mar 2023 - Feb 2025* [1]
  Seoul National University Seoul, Korea
  - Department of Mechanical Engineering
  - Main research area: soft robotics, medical robotics, haptics
  - Advisor: Prof. Amy Kyoungwon Han
- **B.S. in Mechanical Engineering** *Mar 2017 - Aug 2022*
  SungKyunKwan Univsersity Suwon, Korea
  - Department of Mechanical Engineering
  - GPA: 3.83/4.00 (4.1/4.5)
  - Magna Cum Laude / 7 semester early graduation

Research Experience

- **Project A: [Implantable device for Heart Failure]** *Mar 2023 - present*
  Seoul National University, SNU BRM hospital Bio connect project
  - Developed implantable SMA device for Acute Heart Failure
  - collaborating with Cardiovascular surgeon, research for a novel approach for Acute Heart Failure
  - Conducted pig tests several to dozens of times with cardiovascular sensing equipment
  - In-vivo test with developed SMA device
  - Tools: SMA, silicone, DC power supplier, sensors, MPVS, pv catheter
  - ongoing process of writing paper
- **Project B: [Haptic feedback device for robot surgery]** *Mar 2024 - present*
  Seoul National University, NAVER digital bio project with SNU hospital
  - Developed haptic feedback system for training surgeons with robot surgery
  - In the shape of gloves, make arrays of vibration motors for haptic feedback
  - Created various types of vibration for different situations of robot surgery
  - Tools: ERM motor, motor driver, arduino
- **Project C: [Bottle holder for hemiplegia patient]** *Mar 2024 - June 2024*
  Seoul National University, class team project
  - Developed bottle holder using bicycle brake system and 3D printed holder without electrical system
  - graduate class of developing assistive device for the disabled
- **Project D: [Development of screw fastening strategies for robot arm]** *Apr 2021 - June 2022*
  Sungkyunkwan University, Undergraduate research programm
  - Developed strategies for robot arm to fasten misaligned screws
  - With screwdrivers operated by hand, get Force-Torque data from 6 6-axis FT sensor
  - Using data, build strategies on how to get over misaligned situations for robot operation
  - Tools: 6-axis force torque sensor, Franka robot arm

Presentation

[Poster] Jeonghyeon Lee, et al. (2024). **Directional Cutaneous Haptic Feedback of Fingertip for Improved Tactile Sensation in Robotic-Assisted Surgery**. In *Medical Metaverse Society Fall Academic Conference*

[Poster] Jeonghyeon Lee, et al. (2022). **Analysing screwing strategy for robot in misaligned situation**. In *The Korea Society of Mechanical Engineers 2022 Spring Academic Conference*

[1] Exptected

Skills

- **Programming Languages:** Python, C, Matlab
- **Learning:** machine learning, deep learning
- **Robot operating:** ROS, ROS2, OpenCV
- **CAD:** Onshape, Inventor, Solidworks
- **Simulation:** COMSOL, ANSYS
- **Other Tools & Technologies:** Millar catheter, mpvs Ultra, swan-ganz catheter, supporting for animal surgery

Honors and Awards

- **Best Poster Presentation Awards** *Sep 2024*
  Medical Metaverse Society 2024 Fall Academic Conference
- **First place in Student Innovation Challenge** *Aug 2024*
  The 2nd Korea Haptics Conference
  - haptic feedback shoes for visually impaired mobility assistance
  - Design vibration array for haptic feedback to the user

Scholarship

- **National Science & Technology Scholarship, Full-tuition**, Korea Student Aid Foundation *2021 - 2022*
- **2017 Spring semester Academic scholarship**, Sungkyunkwan University *2017 Spring*
- **4 year Admission Excellence scholarship**, Sungkyunkwan University *2017*

Leadership Experience

- **Class project leader of 'Actuation and Sensing Mechanisms for Robots' class** *Sep 2024 - Present*
  Seoul National University, graduate class
  - Creating a humanoid robot with 10,000$ budget
  - The class consists of 30 students, divided into 5 groups.
  - Lead the entire class through the process of developing a complete humanoid robot, from planning and design to fabrication, with the goal of enabling the robot to distinguish between different types of trash.
- **Team leader of 'Senior Capstone Design' class** *Mar 2022 - Aug 2022*
  Sungkyunkwan University, undergraduate class
  - automatic stroller braking system
  - Organize and lead our team through the whole project

Teaching Assistant experience

- **Mechatronics**, Department of Mechanical Engineering, Seoul National University *2023 Spring, Fall, 2024 Spring*

Other experience

- **Custom Car Building Club, frame design** *Jan 2021 - Mar 2021*
- **Military Service, Auxiliary Police** *Aug 2018 - Mar 2020*

Additional Information

Languages: Korean (Native), English (Proficiency level)
TOEIC: 930 (2017), TEPS: 426 (2022), TOEFL: (scheduled for Oct)
Interests: Robotics, Medical robotics, Wearable robotics, Hardware Design, Fabrication, AI learning

References

1. **Amy Kyoungwon Han**
   Assistant Professor, Department of Mechanical Engineering
   Seoul National University
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   Relationship: [Thesis Advisor]
2. **Sejin Oh**
   Professor, Department of Thoracic and Cardiovascular Surgery
   Seoul National University College of Medicine
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   Relationship: [Project Advisor]
3. **Ja Choon Koo**
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