Sung Jae Park

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Education

Seoul National University: **Mar. 2017 – Aug. 2023**

Department of Mechanical Engineering (Double Major in Mathematics), **Accumulative GPA : 4.23/4.3**

Gyeonggi Science Highschool for the Gifted: **Mar. 2014 – Feb. 2017**

Research Interests

I am interested in robot learning for complex, long-horizon robot manipulation. I ultimately aim to develop a general-purpose robot system. To achieve this, the specific topics I am interested in are :

- Learning a model with a human-level physical understanding (e.g. intuitive physics)
- Complex manipulation in the real world (e.g. furniture assembly)

Major Courseworks

- Dynamics / Control Theory
- Introduction to Deep Learning
- Mechatronics
- Numerical Optimization
- Thermodynamics / Heat Transfer
- Probabilistic Graphical Model
- Mathematical Analysis / Abstract Algebra
- Introduction to Robotics
- Mathematical Foundations of Deep Learning
- Data Structure
- Fluid Mechanics
- Solid Mechanics / Mechanics and Design
- Introduction to Topology

Research Experiences

Cognitive Learning for Vision and Robotics Lab Research Intern | **Jul. 2022 – Present**
Advisor : Joseph J. Lim from Korea Advanced Institute of Science and Technology (KAIST)
• Developing an efficient reinforcement learning algorithm based on task-oriented state importance.

SNU Robotics Lab Undergraduate Thesis Research Intern | **Mar. 2022 – Dec. 2022**
Advisor : Frank C. Park from Seoul National University
• Developed cross-embodiment learning with object-centric motion planning
• With an object-centric planner learned from offline demonstration data of another robot, the target robot can efficiently learn the same task

Dynamic Robotics Systems Lab Research Intern | **Jul. 2021 – Aug. 2021, Jan. 2022 – June. 2022**

Advisor : Jaeheung Park from Seoul National University
• Developed vision-based peg-in-hole algorithm for dual robot arm with hole detection using hand-eye camera and YOLO.
• Developed motion planning algorithm under constraint with block neural autoregressive flow (BNAF) for Panda Franka robot arm. Density estimation model was used to determine the discontinuity of the manifold.

Awards and Honors

Outstanding BS Thesis Presentation Award **Dec. 2022**
Presidential Science Scholarship **Mar. 2021 – Present**
International Design Contest Robocon 2018 2nd place **Aug. 2018**
Gangwon Future Highflier Scholarship **Jan. 2018 – Present**
Full-funded scholarship for academic excellence **Mar. 2018 – Dec. 2019, Mar.2021**
Silver Prize (Math/Computation Field), Samsung Humantech Paper Award **Feb. 2015**

Skills

Language : C++, Python, Java
Libraries/Frameworks : Pytorch, ROS, YOLO, SMACH
Modeling : SolidWorks

Teaching Experience

Undergraduate Tutoring | Physics 1,2 **Mar. 2018 – Dec. 2018, Mar. 2021 – Dec.2021**

Undergraduate Tutoring | Linear Algebra 1 **Mar. 2021 – Jun.2021**

Teaching Assistant | Introduction to Robotics **Mar. 2022 – Jun. 2022**

English Proficiency

GRE: Verbal Reasoning 160/170, Quantitative Reasoning 170/170, Analytical Writing 4.0/6.0

TOEFL : 112/120 (Reading 29/30, Listening 30/30, Speaking 26/30, Writing 27/30)