

Hyunyoung Jung

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Research Interest

Deep Reinforcement Learning, Legged Robot, Motion Retargeting, Robotics, Computer Vision

Education

Georgia Institute of Technology

Atlanta, GA

M.S. IN ELECTRICAL AND COMPUTER ENGINEERING

2022 - 2024 (expected)

- Advisor: Prof. Sehoon Ha
- GPA: 4.0/4.0
- Selected Courses: Convex Optimization, Mathematical Foundation of Machine Learning, Statistical Machine Learning, Linear System and Control

Seoul National University

Seoul, South Korea

B.S. IN MECHANICAL ENGINEERING & COMPUTER SCIENCE AND ENGINEERING

2016 - 2022

- Thesis advisor: Prof. Frank Chongwoo Park
- GPA: 3.93/4.3 (Summa Cum Laude)
- Includes mandatory military service

Publications

- Donghoon Youm*, **Hyunyoung Jung***, Hyeongjun Kim, Jemin Hwangbo, Hae-Won Park, Sehoon Ha
Imitating and Finetuning Model Predictive Control for Robust and Symmetric Quadrupedal Locomotion
RA-L, 2023 (***equal contribution**)
- Tianyu Li, **Hyunyoung Jung**, Matthew Gombolay, Yong Kwon Cho, Sehoon Ha
CrossLoco: Human Motion Driven Control of Legged Robots via Guided Unsupervised Reinforcement Learning
ICLR, 2024

Research Projects

Ha Lab

Georgia Institute of Technology

ADVISOR: PROF. SEHOON HA

Aug. 2022 - Present

- **IFM: Imitating and fine-tuning the model predictive control**
 - Problem: bridging the gap between model-based and learning-based approaches for legged robot control
 - This work proposes a two-stage learning framework where the first stage includes imitation of Model Predictive Control (MPC) and the second stage includes fine-tuning the pre-trained policy with reinforcement learning
 - This work contains extensive hardware experiments and simulation tests
 - Result: improved performance of existing MPC controller and reduced burden of reward engineering that exists in learning-based locomotion training
 - **Accepted to RA-L** [paper]
- **CrossLoco: Human motion-driven control of legged robots**
 - Problem: motion retargeting between significantly different morphologies
 - This work proposes a guided unsupervised reinforcement learning framework that simultaneously learns (quadrupedal) robot skills and their correspondence through the cycle-consistency-based reward
 - This work contains a series of ablation studies and user studies and proposes applications of the framework
 - Result: diverse motion and increased root tracking performance with higher human preference compared to the baselines
 - **Accepted to ICLR** [paper]
- **Humanoid control by leveraging model-based control (In progress)**
 - Problem: addressing the challenges of data-intensive training and reward engineering in learning-based approaches for humanoid locomotion training
 - This work restricts the solution search space by leveraging model-based control demonstrations

Bachelor's Thesis

ADVISOR: PROF. FRANK CHONGWOO PARK

Seoul National University

Apr. 2021 - Dec. 2021

- **End-to-end edge detection framework with a deep learning framework**
 - Problem: edge detection for visual inspection in industrial data
 - This work applies deep learning models for edge detection tasks, enhancing performance on a limited amount of industrial data using transfer learning
 - This work conducts ablation studies on the network architecture and suggests an edge distance measure algorithm
 - Result: robust edge detection and edge distance measure framework

Industrial Experiences

Saige Research

Research Intern

Seoul, Korea

Apr. 2021 - Dec. 2021

- Applied a deep learning framework to detect the edge configuration of industrial data

Samsung Electronics

Undergraduate Intern

Network Division

Jan. 2021 - Feb. 2021

- Designed brackets for mounting communication equipment

Class Projects

Computer Programming

Individual Project

Seoul National University

Spring 2020

- Implemented Chessboard Game in JAVA

Logic Design

Individual Project

Seoul National University

Fall 2020

- Created a digital alarm clock using Xilinx

Computer Vision

Team Project

Seoul National University

Fall 2021

- Title: Computer vision with Deep Neural Network
- Conducted experiments on improving the deep model performance using classical computer vision techniques

Deep Learning: Statistical Perspective

Individual Project

Seoul National University

Fall 2021

- Title: Well matching name generation
- Utilized an image captioning model to create a plausible name for human facial images

Scholarships

Boeing Korea Scholarship, Boeing Korea

Fall 2020

Merit-based Scholarship, Seoul National University

Fall 2019

Eminence Scholarship, Seoul National University

Spring 2017

Merit-based Scholarship, Seoul National University

Fall 2016

Teaching & Mentoring Experience

Fall 2023 Waleed Bin Khalid, Georgia Institute of Technology

Mentoring

Spring 2023 CS3451, Computer Graphics

Teaching Assistant

Skill Sets

Programming Language : Python, C++

Deep Learning Framework : Pytorch, JAX

Physics Simulator : RaiSim, MuJoCo, NVIDIA Isaac Gym, Pybullet

3D Visualization Tool : Blender