

HANBYEOL YOON

Mechanical & Aerospace Engineering, University of California, Los Angeles
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RESEARCH INTERESTS

Robotics; Control/Estimation; Computer Vision; Machine Learning; Human-Robot Interaction;

EDUCATION

Seoul National University

Seoul, S.Korea

Bachelor of Science in Mechanical & Aerospace Engineering

Mar 2013 - Feb 2020*

- Academic Advisor: Prof. Dongjun Lee
- GPA: Major **4.03**/4.3, Overall **3.94**/4.3 (*Summa Cum Laude*)

*including a 2-year hiatus due to Korea military service as KATUSA (May 2014 - Feb 2016)

WORK EXPERIENCE

LG Electronics Inc.

Seoul, S.Korea

Associate Researcher at Industrial Robot Development Team

Jan 2020 - Aug 2021

- Collaborative Robot Manipulator Development
- AI-Vision based Robot Manipulator Control in Robot Production System

PUBLICATIONS & PRESENTATIONS

1. Y. S. Lee, W. K. Do, **H. B. Yoon**, J.W. Heo, W. H. Lee, and D. J. Lee, “Visual-Inertial Hand Motion Tracking with Robustness to Occlusion, Interference, and Contact,” *Science Robotics*, 2021. [link]
2. Y. S. Lee, **H. B. Yoon**, J. W. Huh, W. H. Lee, and D. J. Lee, “Wearable Visual-Inertial Hand Tracking Interface Regardless of Environment and Occlusion,” *IROS workshop on Visual-Inertial Navigation: Challenges and Application*, 2019. [link], [pdf]

HONORS & AWARDS

- **Korean Government Scholarship Program (\$ 40,000/yr)** Aug 2020
Received the Korean Government Scholarship for Study Overseas through a competitive selection examination conducted by the Korean government.
- **KOFAC URP President’s Award (\$ 8,000)** Mar 2018 - Mar 2019
Garnered KOFAC President’s Award through Undergraduate Research Program (URP) supported by Korea Foundation for the Advancement of Science & Creativity (KOFAC).
- **SNU Entrepreneurship Center Chief’s Award (\$ 500)** Jan 2019
Won 2nd prize at Startup Club Champions League held by SNU Entrepreneur Center and Ministry of SMEs and Startups (MSS) for “Maewhatle”.
- **National Scholarship (\$ 6,000/yr), Korea Student Aid Foundation** 2013 - 2018
Received full tuition of 8 semesters except the 2-year hiatus for Korean military service.
- **Student of Honor (\$ 2,500), SNU MECH Alumni Association** Oct 2016
Garnered Student of Honor in the department of Mechanical & Aerospace Engineering by showing the most outstanding academic performance in 2016.
- **Local Talent Scholarship (\$ 2,000), Iksan Scholar Aid Foundation** Aug 2014
Garnered Local Talent Scholarship supporting local talents to nurture global talents.

RESEARCH EXPERIENCES

Interactive & Networked Robotics Laboratory

Seoul, S.Korea

Advisor: Prof. Dongjun Lee

Mar 2019 - Dec 2019

- Control of Dual-arm Telerobotic System on Flexible Support
 - Derived Newton-Euler equations of nonlinear dynamic dual-arm telerobotic system.
 - Designed controller for stabilizing dual-arm telerobotic system on flexible support.
 - Constructed 3D model of dual-arm telerobotic system and simulated the system.
- Robust Visual-Inertial Hand Tracking System
 - Developed robust estimation algorithm of visual-inertial hand tracking interface.
 - Fused visual and inertial sensor information and obtained robust tracking results.
 - Rendered estimated hand model in Virtual Reality (VR) and developed multi-drone control interface for a live demo scenario at IROS 2019 workshop.

Biorobotics Laboratory

Seoul, S.Korea

Advisor: Prof. Kyujin Cho

Mar 2018 - Dec 2018

- Origami-inspired Robotic System Development
 - Developed origami-inspired robotic arm that can be folded and unfolded.
 - Improved mobility and manipulability of mobile manipulator achieving deformability.
 - Modeled and fabricated origami-inspired self-locking modules with 3D CAD tools.
 - Designed optimal tendon path and controlled using folding and unfolding mechanism.

ChunLab, Inc

Seoul, S.Korea

Advisor: Prof. Jongsik Chun

Dec 2017 - Dec 2018

- Real-time Microbiome Diagnosis System Development
 - Developed autonomous real-time microbiome diagnosis system consisting of a manipulator for fecal sampling and a 3rd-generation DNA sequencer for diagnosis.
 - Developed safe control algorithm of the system for robust fecal data acquisition.
 - Yielded fecal dataset for computational biology research about studying correlation between microbiome and health state of people using the robotic system.
 - Acknowledged by the Korea Foundation for the Advancement of Science & Creativity (KOFAC), SNU Entrepreneur Center, and Ministry of SMEs and Startups (MSS).

PROJECTS

Robot Manipulator Obstacle Avoidance Control

Seoul, S.Korea

Advisor: Prof. Jaeheung Park

Sep 2018 - Dec 2018

- Developed obstacle-avoidance control algorithm to control end effector of manipulator to move through four different destinations while avoiding randomly spread obstacles.
- Controlled robot manipulator with two hierarchical objectives utilizing null space control.

Design Parameter Optimization

Seoul, S.Korea

Advisor: Prof. Yoonyoung Kim

Mar 2018 - June 2018

- Designed a gyrocopter through parameter optimization with regression model.
- Maximized unactuated flight time with size and material constraints.
- Won 2nd place at SNU Optimal Design Competition in Fall 2018.

TECHNICAL SKILLS

Engineering Tools & Softwares: Solidworks, Creo, AutoCAD, LabVIEW, Unity3D, V-rep
Programming Languages: C/C#/C++, MATLAB, Python

EXTRACURRICULAR ACTIVITIES

People to People International (PTPI) at SNU

Mar 2017 - Jan 2018

- Joined in PTPI at SNU, South Korea Chapter and participated in volunteer activities.
- Supported Seoul International Wheelchair Marathon (S.I.W.M) as a member of the Korea Association of Persons with Physical Disabilities (KAPPD).
- Delivered daily necessity for the old at the Public Yongsan Disabled Welfare Center.

Korean Augmentation to the United States Army (KATUSA)

May 2014 - Feb 2016

- Appointed as the senior KATUSA and supported communication between the Republic of Korea Army (ROKA) and the U.S. Army commanding group.
- Received training for Expert Field Medical Badge (EFMB) as a combat medic specialist.

TEACHING EXPERIENCES

Tutor at College of English, Seoul National University

Mar 2018 - June 2018

Education Volunteer at Nest of Sharing

Mar 2014 - May 2014

Education Volunteer at Iksan Scholar Aid Foundation

Jan 2013 - Dec 2013

REFERENCES

Prof. Dongjun Lee

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Prof. Joel Park

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