

Hochul Hwang

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EDUCATION

Hanyang University

B.S. in Robot Engineering, GPA: 3.91 / 4.5 (Cum Laude)

Ansan, Republic of Korea

Mar.2013 - Jun.2019

The University of Texas at Austin

Exchange Program, Electrical and Computer Engineering at the Cockrell School of Engineering

Austin, Texas, United States

Aug.2017 - May.2018

RESEARCH EXPERIENCE

Korea Institute of Science and Technology

Research Intern / Center for Artificial Intelligence / Advisor: Dr. Ig-Jae Kim

Seoul, Republic of Korea

Sep.2019 - Present

Developed code for a real-time human action recognition system having classification accuracy of 75% (over 90% in trimmed videos)

- Task: Finetune deep learning algorithms with augmented synthetic action data for enhanced recognition performance
- Required skills: PyTorch, LaTeX

Ulsan National Institute of Science and Technology & Sungkyunkwan University

Research Intern / BCI Lab / Advisor: Prof. Sung-Phil Kim and Prof. Jeongwoo Sohn

Ansan, Republic of Korea

Jul.2019 - Aug.2019

Setup an eye-tracking system for primate brain computer interface (BCI) system and developed code for task tools

- Required skills: MATLAB

The University of Texas at Austin

Research Assistant / Human Centered Robotics Lab / Advisor: Prof. Luis Sentis

Austin, Texas, United States

Sep.2017 - Aug.2018

Participated in the whole process of developing, testing and optimizing the 6DOF passive-ankled bipedal humanoid

- Task: Experiment protocol setup, dynamic biped balancing test, documentation of experiment results
- Required skills: State estimation, sensor data analysis obtained from joint encoders, IMU, motion capture, and contact sensor; Python coding for data plot and 3D printing

Co-authored conference papers

- Task: Simulation data collection, figure generation, video editing
- Required skills: C++, Inkscape, Adobe Premiere Pro

The University of Texas at Austin

Research Assistant / Lu Research Group / Advisor: Prof. Nanshu Lu

Austin, Texas, United States

Apr.2018 - Jun.2018

Conducted independent research to measure lower limb prosthetic's inner stress distribution using flexible resistive force sensors

- Task: Resistive force sensor optimization, capacitive force sensor
- Required skills: Resistance/stress data analysis, LabVIEW, Silhouette Studio

Korea Institute of Industrial Technology

Research Intern / Culture Technology R&D Group / Advisor: Dr. Sangwon Lee

Ansan, Republic of Korea

Dec.2016 - Mar.2017

Supported in two research projects: Ship video recording structure, autonomous stage for K-pop performances

- Task: Stewart platform analysis for ocean simulation and gimbal system design, stage assembly
- Required skills: MATLAB, SolidWorks

PUBLICATIONS

1. **H. Hwang**, C. Jang, G. Park, J. Cho, and I.J. Kim, " ElderSim: A Synthetic Data Generation Platform for Human Action Recognition in Eldercare Applications", *IEEE Access*, 2020 (submitted; [preprint](#))
2. D. Kim, S. J. Jorgensen, **H. Hwang**, and L. Sentis, "Control Scheme and Uncertainty Considerations for Dynamic Balancing of Passive-Ankled Bipeds and Full Humanoids", *IEEE-RAS International Conference on Humanoid Robots (Humanoids)*, 2018
3. D. Kim, J. Lee, O. Campbell, **H. Hwang**, and L. Sentis, "Computationally-Robust and Efficient Prioritized Whole-Body Controller with Contact Constraints", *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2018

PRESENTATIONS

Session Presentation	Institute of Electronics and Information Engineers, Jeju, Republic of Korea
"Improving Elderly Action Recognition Performance via Synthetic Data Training"	Aug.19, 2020
<ul style="list-style-type: none">Validated RGB-based action recognition method by training on additional synthetic data on various experimental settings	
Poster Presentation	Clinically Applied Rehabilitation Engineering Research Symposium, Austin, TX
"Optimization in Prosthetic Socket Design"	Apr.13, 2018
<ul style="list-style-type: none">Introduced a method to improve socket designs based on stress distribution data; collaborated with Hanger Clinic	

HONORS AND AWARDS

Hanyang University, Achievement Award	Aug.2019 - Aug.2019
STEAM Open Embedded Contest, Creative Technology and Excellence Award	Jun.2017 - Aug.2017
<ul style="list-style-type: none">Designed a robotic knee brace with CATIA and applied PI controller with Arduino	
Hanyang University Scholarship, Academic Achievement	Mar.2017 - Jun.2017
Haksan Foundation Scholarship, Academic Achievement	Sep.2016 - Dec.2016
Futuristic Impressive Useful Display Competition, Finals	Aug.2016 - Sep.2016
<ul style="list-style-type: none">Presented an idea of a tablet braille device applying carbon nanotube for braille readers	

PROFESSIONAL EXPERIENCE

National Science Foundation Workshop	Dell Medical School, UT, Austin, TX, United States
"Smart and Connected Health"	Mar.11 - 14, 2018
<ul style="list-style-type: none">Participated in development of atrial fibrillation data distinguishing algorithm using MATLAB	
Engineer Battalion of the South Korea Army	The 17th Infantry Division of Korea, Incheon, Republic of Korea
Driver and repairer of the M9 Armored Combat Earthmover and bulldozer, squad leader	Feb.2014 - Dec.2015
<ul style="list-style-type: none">Excavated and cleared areas suspected of land mine contaminationParticipated in the 2014 Asian Games and Asian Para-Games as a national flag bearer	

SKILLS

Programming
(Good) Python, PyTorch, (Familiar) C/C++, ROS, MATLAB, TensorFlow
Operating System
(Good) Linux
Computer-Aided Design Software
(Good) CATIA, SolidWorks (Certified SolidWorks Associate), (Familiar) Blender
Editing Tool
(Good) LaTeX, (Familiar) Adobe Premiere Pro, Inkscape

EXTRACURRICULAR ACTIVITIES

Teaching Experience	
Missionary Group Teacher	SaRang Community Church, Seoul, Republic of Korea
<ul style="list-style-type: none">Taking care of young adults with intellectual disabilities	
Knowledge factory Makerspace Instructor	Hanyang University, Ansan, Republic of Korea
<ul style="list-style-type: none">Taught 3D printing process to undergraduate students	
Hanmille International Mentor	Hanyang University, Ansan, Republic of Korea
<ul style="list-style-type: none">Assisted two international engineering students with coursework and living	
Startup Activities	Capital Factory, Austin, Texas, United States
"Crash Cook-Off" team initial member	Nov.2017- Jan.2018
<ul style="list-style-type: none">Built a team at 3 Day Startup, pitched ideas to investors, and actually provided a team-building service	
Robotics Engineering Soccer Club	Hanyang University, Ansan, Republic of Korea
Team Captain	May.2013 - May.2017