

# Hochul Hwang

University of Massachusetts Amherst  
College for Information and Computer Sciences

Phone: 413.800.7295  
Email: [hochulhwang@cs.umass.edu](mailto:hochulhwang@cs.umass.edu)

Skype: live:hchlhwang  
URL: <https://hchlhwang.github.io/>

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## EDUCATION

<b>University of Massachusetts Amherst</b> M.S./Ph.D. in Computer Science	Amherst, MA, United States May.2021 - Present
<b>Hanyang University</b> B.S. in Robot Engineering, GPA: 3.91 / 4.5 (Cum Laude)	Ansan, Republic of Korea Mar.2013 - Jun.2019
<b>The University of Texas at Austin</b> Exchange Program, Electrical and Computer Engineering	Austin, TX, United States Aug.2017 - May.2018

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## RESEARCH EXPERIENCE

<b>University of Massachusetts Amherst (Dynamic and Autonomous Robotic Systems Lab)</b> MS-PhD Student / Advisor: Prof. Donghyun Kim Conducting research in developing control algorithms to mimic human-level athletic behavior in legged robotic systems	Amherst, MA, United States May.2021 - Present
<b>Korea Institute of Science and Technology (Center for Artificial Intelligence)</b> Research Intern / Advisor: Dr. Ig-Jae Kim Developed a real-time human action recognition system with accuracy of 75% (90% in trimmed videos) and published a paper <ul style="list-style-type: none"><li>Task: Finetune deep learning algorithms with augmented synthetic action data for enhanced recognition performance</li><li>Required skills: PyTorch, LaTeX</li></ul>	Seoul, Republic of Korea Sep.2019 - Dec.2020
<b>Ulsan National Institute of Science and Technology &amp; Sungkyunkwan University (BCI Lab)</b> Research Intern / Advisor: Prof. Sung-Phil Kim and Prof. Jeongwoo Sohn Setup an eye-tracking system for primate brain computer interface (BCI) system and developed code for task tools <ul style="list-style-type: none"><li>Required skills: MATLAB</li></ul>	Ansan, Republic of Korea Jul.2019 - Aug.2019
<b>The University of Texas at Austin (Human Centered Robotics Lab)</b> Research Assistant / Advisor: Prof. Luis Sentis Participated in the process of developing, testing, and optimizing the 6DOF passive-ankled bipedal humanoid <ul style="list-style-type: none"><li>Task: Experiment protocol setup, dynamic biped balancing test, simulation data collection, figure generation</li><li>Required skills: State estimation, sensor data analysis obtained from joint encoders, IMU, motion capture, and contact sensor; Data plot (Python), simulation (C++), and 3D printing</li></ul>	Austin, Texas, United States Sep.2017 - Aug.2018
<b>The University of Texas at Austin (Lu Research Group)</b> Research Assistant / Advisor: Prof. Nanshu Lu Conducted independent research to measure lower limb prosthetic's inner stress distribution using flexible resistive force sensors <ul style="list-style-type: none"><li>Task: Resistive force sensor optimization, capacitive force sensor</li><li>Required skills: Resistance/stress data analysis, LabVIEW, Silhouette Studio</li></ul>	Austin, Texas, United States Apr.2018 - Jun.2018
<b>Korea Institute of Industrial Technology (Culture Technology R&amp;D Group)</b> Research Intern / Advisor: Dr. Sangwon Lee Supported in two research projects: Ship video recording structure, autonomous stage for K-pop performances <ul style="list-style-type: none"><li>Task: Stewart platform analysis for ocean simulation and gimbal system design, stage assembly</li><li>Required skills: MATLAB, SolidWorks</li></ul>	Ansan, Republic of Korea Dec.2016 - Mar.2017

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## 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*, 2021
2. D. Kim, S. J. Jorgensen, **H. Hwang**, and L. Sentis, "Control Scheme and Uncertainty Considerations for Dynamic Balancing of Passive-Ankled Biped 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

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## PRESENTATIONS

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<b>Session Presentation</b>	Institute of Electronics and Information Engineers, Jeju, Republic of Korea
"Improving Elderly Action Recognition Performance via Synthetic Data Training"	Aug.19, 2020
• Validated RGB-based action recognition method by training on additional synthetic data on various experimental settings	
<b>Poster Presentation</b>	Clinically Applied Rehabilitation Engineering Research Symposium, Austin, TX
"Optimization in Prosthetic Socket Design"	Apr.13, 2018
• Introduced a method to improve socket designs based on stress distribution data; collaborated with Hanger Clinic	

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## HONORS AND AWARDS

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<b>CICS Jumpstart Fellowship</b>	Sep.2021 - May.2022
<b>STEAM Open Embedded Contest, Creative Technology and Excellence Award</b>	Jun.2017 - Aug.2017
• Designed a robotic knee brace with CATIA and applied PI controller with Arduino	
<b>Hanyang University Scholarship, Academic Achievement</b>	Mar.2017 - Jun.2017
<b>Haksan Foundation Scholarship, Academic Achievement</b>	Sep.2016 - Dec.2016
<b>Futuristic Impressive Useful Display Competition, Finals</b>	Aug.2016 - Sep.2016
• Presented an idea of a tablet braille device applying carbon nanotube for braille readers	

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## PROFESSIONAL EXPERIENCE

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<b>National Science Foundation Workshop</b>	Dell Medical School, UT, Austin, TX, United States
"Smart and Connected Health"	Mar.11 - 14, 2018
• Participated in development of atrial fibrillation data distinguishing algorithm using MATLAB	
<b>Engineer Battalion of the South Korea Army</b>	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
• Excavated and cleared areas suspected of land mine contamination	
• Participated in the 2014 Asian Games and Asian Para-Games as a national flag bearer	

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## SKILLS

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### 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

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## EXTRACURRICULAR ACTIVITIES

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### Teaching Experience

Missionary Group Teacher	SaRang Community Church, Seoul, Republic of Korea
• Taking care of young adults with intellectual disabilities	Feb.2019 – May.2021
Knowledge factory Makerspace Instructor	Hanyang University, Ansan, Republic of Korea
• Taught 3D printing process to undergraduate students	Mar.2017 - May.2017
Hanmille International Mentor	Hanyang University, Ansan, Republic of Korea
• Assisted two international engineering students with coursework and living	Aug.2016 - Dec.2016

### Startup Activities

"Crash Cook-Off" team initial member	Capital Factory, Austin, Texas, United States
• Built a team at 3 Day Startup, pitched ideas to investors, and actually provided a team-building service	Nov.2017- Jan.2018

### Robotics Engineering Soccer Club

Team Captain	Hanyang University, Ansan, Republic of Korea
	May.2013 - May.2017