Hochul Hwang

Email : hochulhwang@cs.umass.edu
Personal webpage: https://hchlhwang.github.io
Github: https://github.com/hchlhwang
Linkedin: https://www.linkedin.com/in/hchlhwang
Mobile : +1-413-800-7295

Education

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

Skills Summary

- **Computing**: Python, C++, PyTorch, TensorFlow, MATLAB, GIT, Linux, ROS, LaTeX
- **Computer-aided design (CAD)**: SOLIDWORKS (Certified SolidWorks Associate), CATIA, Onshape, Blender

Working Experience

- **Korea Institute of Science and Technology (Center for Artificial Intelligence)** — Seoul, Republic of Korea
  Research Intern - Dr. Ig-Jae Kim — *Sep 2019 - Dec 2020*
  - **Human action recognition system (Access'21)**: Deployed multiple deep learning methods, finetuned with synthetic data and developed a real-time human action recognition system with improved accuracy of 75% (trimmed videos: 90%).

Research Experience

- **University of Massachusetts Amherst (Dynamic and Autonomous Robotic Systems Lab)** — Amherst, MA
  Graduate Research Assistant - Prof. Donghyun Kim — *May 2021 - Present*
  - **Guide dog robot development**: Leading project to support mobility for the visually impaired individuals (local news).
    - **Qualitative research**: Interviewed visually impaired people & guide dog trainers; data analysis (open&axial coding).
    - **Perception**: Implementing multi-task learning algorithms (e.g., MTAN); collected egocentric multi-view data.
    - **Autonomous navigation**: Advising MS student implementing a visual representation learning based path planner.
    - **Control**: Utilized nonlinear optimization solvers (Knitro, IPOPT) for humanoid stand-up simulation (Unity).
    - **Hardware**: Implemented speech recognition system; designed the harness handle of the robot via CAD.
- **UNIST & Sungkyunkwan University (BCI Lab)** — Suwon, Republic of Korea
  Research Intern - Prof. Sung-Phil Kim and Prof. Jeongwoo Sohn — *Jul 2019 - Aug 2019*
  - **Non-human primate brain computer interface (BCI) system setup**: Implemented game tasks in MATLAB for experiments and setup an eye-tracking system for primate BCI system.
- **The University of Texas at Austin (Human Centered Robotics Lab)** — Austin, TX
  Research Assistant - Prof. Luis Sentis — *Sep 2017 - Aug 2018*
  - **Development and testing a 6 DOF passive-ankled humanoid (IROS'18, Humanoids'18)**:
    - **Data visualization**: Visualized data from real world experiments and simulation (joint encoder, IMU, motion capture).
    - **Dynamic biped balancing experiment**: Experiment protocol setup, experiments, CAD design, and 3D printing.
- **The University of Texas at Austin (Lu Research Group)** — Austin, TX
  Research Assistant - Prof. Nanshu Lu — *Apr 2018 - Jun 2018*
  - **Flexible resistive force sensor optimization (Advanced Materials'21)**: Analyzed sensor data and optimized force sensor design for improved measurement of the stress distribution inside a lower limb prosthesis.
- **Korea Institute of Industrial Technology (Culture Technology R&D Group)** — Ansan, Republic of Korea
  Research Intern - Dr. Sangwon Lee — *Dec 2016 - Mar 2017*
  - **Ship onboard video recording system design**: Designed 3D CAD parts for a gimbal system.

Publications

1. K. H. Ha, W. Zhang, H. Jang, S. Kang, L. Wang, P. Tan, **H. Hwang**, and N. Lu."Highly Sensitive Capacitive Pressure Sensors over a Wide Pressure Range Enabled by the Hybrid Responses of a Highly Porous Nanocomposite", *Advanced Materials, 2021*
2. **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*
3. 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, 2018*
4. 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, 2018*