

# Hyung-gun Chi

PHD CANDIDATE

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## Research Interests

My research interests lie in the fields of Computer Vision and Machine Learning. More specifically, I am interested in the Representation Learning for human action, 3D Computer Vision, and their applications in VR / AR devices and Autonomous Vehicles.

## Education

### Purdue University

West Lafayette, IN, USA

PHD IN ELECTRICAL AND COMPUTER ENGINEERING

Dec. 2023 (Expected)

- Thesis: Learning Representation for Understanding Human Action
- Advisor: Professor Karthik Ramani

### Purdue University

West Lafayette, IN, USA

MS IN ELECTRICAL AND COMPUTER ENGINEERING

Dec. 2022

- Advisor: Professor Karthik Ramani

### Yonsei University

Seoul, South Korea

BS IN MECHANICAL ENGINEERING

Feb. 2017

- Advisor: Professor Soo-Hong Lee

## Publications and Patents

### Conference Proceedings

- [C7] **H. Chi**, K. Lee, N. Agarwal, K. Ramani, and C. Choi. AdamsFormer for Spatial Action Localization in the Future, *Conference on Computer Vision and Pattern Recognition (CVPR)*, 2023. Submitted.
- [C6] **H. Chi**, S. Chi, Q. Huang, and K. Ramani. Skeleton-ODE: Learning Representation by Predicting the Future for Online Skeleton-based Action Recognition, *Conference on Computer Vision and Pattern Recognition (CVPR)*, 2023. Submitted.
- [C5] Y. Xu, A. Bazarjani, **H. Chi**, C. Choi, and Y. Fu. Uncovering the Missing Pattern: Unified Framework Towards Trajectory Imputation and Prediction, *Conference on Computer Vision and Pattern Recognition (CVPR)*, 2023. Submitted.
- [C4] **H. Chi**, S. Chi, S. Chan, and K. Ramani. Pose Relation Transformer: Refine Occlusions for Human Pose Estimation, *IEEE International Conference on Robotics and Automation (ICRA)*, 2023. Submitted.
- [C3] **H. Chi**, M. Ha, S. Chi, S. Lee, Q. Huang, and K. Ramani. InfoGCN: Representation Learning for Human Skeleton-based Action Recognition, In proceedings of *Conference on Computer Vision and Pattern Recognition (CVPR)*, 2022.
- [C2] **H. Chi**, S. Kim, X. Hu, Q. Huang, and K. Ramani. A Large-scale Mechanical Components Benchmark for Deep Neural Networks. In proceedings of the 16th *European Conference on Computer Vision (ECCV)*, 2020.
- [C1] S. Kim, **H. Chi**, and K. Ramani. First-Person View Hand Segmentation of Multi-Modal Hand Activity Video Dataset. In proceedings of the 31st *British Machine Vision Conference (BMVC)*, 2020.

### Journal Papers

- [J3] S. Kim, **H. Chi** and K. Ramani. Object synthesis by learning part geometry with surface and volumetric representations. In *Computer-Aided Design* (2021): 102932.
- [J2] S. Kim, N. Winovich, **H. Chi**, G. Lin, and K. Ramani. Latent transformations neural network for object view synthesis. In *The Visual Computer* (2019): 1-15.
- [J1] H. T. Hwang, **H. Chi**, N. K. Kang, H. B. Kong and Soo-Hong Lee. An Evaluation Methodology for 3D Deep Neural Network using Visualization in 3D Data Classification. In *Journal of Mechanical Science and Technology (JMST)* 33, no. 3 (2019): 1333-1339.

### Preprinted papers

- S. Kim, J. Bae, **H. Chi**, S. Hong, B.S. Koh, and K. Ramani. Egocentric View Hand Action Recognition by Leveraging Hand Surface and Hand Grasp Type. *arXiv preprint arXiv:2109.03783*, 2021.

### Patents

- [P2] K. Ramani, S. Kim, and **H. Chi**. Pixel-wise Hand Segmentation of Multi-modal Hand Activity Video Dataset. U.S. Patent Application No. 17/109,193.
- [P1] **H. Chi**. Computer Input Automation System. KR Patent No. 10-1745330, issued 2017.

## Work Experience

### Honda Research Institute

San Jose, CA, USA

RESEARCH INTERN

Jan. 2023 - Apr. 2023

- Conducted human pose prediction research for autonomous vehicles.

## Honda Research Institute

RESEARCH INTERN

San Jose, CA, USA

May. 2022 - Aug. 2022

- Conducted research on future action forecasting task for autonomous vehicles.
- Developed a transformer-based algorithm for the task.

## NEIL LAB Corporation

SOFTWARE ENGINEER & CEO

Seoul, South Korea

Sep. 2016 - Dec. 2017

- Founded and manage a start-up company as a CEO and senior software engineer.
- Developed an office automation system specifically for automating office tasks such as sending an e-mail or issuing receipts.
- Designed a back-end system and database for customer web-service which automatically collects and integrate financial and personal data. (Relevant patent: [P1])

## Skills

### Research and Development Stacks

<b>Major Languages</b>	Python, C/C++
<b>Machine Learning</b>	PyTorch, TensorFlow, Keras
<b>Web Frameworks</b>	Django, Flask, Node.js
<b>Computer Vision</b>	OpenCV, OpenGL
<b>Web Languages</b>	Nginx, React, HTML5, PHP, JavaScript, CSS
<b>Database</b>	MySQL, PostgreSQL, SQLite, MongoDB

### Other Tools and Skills

<b>Text Editors</b>	Neovim & Vim
<b>Other Languages</b>	Shell Scripts(bszh, zsh), Matlab(Octave), R
<b>Operating Systems</b>	macOS, Linux Debian/Ubuntu, Windows
<b>IDE</b>	VSCode, Eclipse, IDEA
<b>Softwares</b>	SolidWorks, Catia, AutoCAD
<b>VCS</b>	Git

## Academic Activities

### Reviewer

- The IEEE Conference on Artificial Intelligence (CAI) 2023
- The IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) 2023
- The British Machine Vision Conference (BMVC) 2020, 2021, 2022
- Journal of Visual Communication and Image Representation (JVCI)
- Journal of Computing and Information Science in Engineering (JCISE)

## Invited Talks

### Hongik University

Seoul, South Korea

Guest Lecturer: LEARNING REPRESENTATION FOR HUMAN ACTION RECOGNITION

Dec. 2022

## References

<b>Karthik Ramani</b>	Professor, Purdue University	ramani@purdue.edu
<b>Soo-Hong Lee</b>	Professor, Yonsei University	shlee@yonsei.ac.kr