

Hyung-gun Chi

PHD CANDIDATE

585 Purdue Mall ME3171, West Lafayette, IN 47907

✉ hgchi@purdue.edu | 🌐 engineering.purdue.edu/people/hyung.gun.chi.1 | 📧 stnoah1 | 📺 hyung-gun | 🏠 Hyung-gun Chi

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

Aug. 2018 - Dec. 2023 (Expected)

- Thesis: Learning Representation for Human Action
- Advisor: Prof. Karthik Ramani

Purdue University

West Lafayette, IN, USA

MS IN ELECTRICAL AND COMPUTER ENGINEERING

Aug. 2018 - Dec. 2022

- Advisor: Prof. Karthik Ramani

Yonsei University

Seoul, South Korea

BS IN MECHANICAL ENGINEERING

Mar. 2010 - Feb. 2017

- Advisor: Prof. Soo-hong Lee
- 2-year military service (2011-2013)

Research and Work Experience

Toyota Research Institute

Los Altos, CA, USA

RESEARCH INTERN

May. 2023 - Aug. 2023

- Conducted human-robot interaction research (Host : Dr. Thomas Kollar).

Honda Research Institute USA

San Jose, CA, USA

RESEARCH INTERN

Jan. 2023 - May. 2023

- Conducted human motion prediction research for autonomous vehicles (Host: Dr. Kwonjoon Lee).

Honda Research Institute USA

San Jose, CA, USA

RESEARCH INTERN

May. 2022 - Aug. 2022

- Conducted research on future action forecasting task for autonomous vehicles (Host: Dr. Chiho Choi).

Convergence Design Lab, Purdue University

West Lafayette, IN, USA

GRADUATE RESEARCH ASSISTANT

Aug. 2018 - Present

- Conducted skeleton-based human action recognition and pose estimation research (Advisor: Prof. Karthik Ramani).

HeumLabs Corporation

Seoul, South Korea

SOFTWARE ENGINEER & CEO

Sep. 2016 - Dec. 2017

- Founded and managed a start-up company as a CEO.
- Developed an office automation system specifically for automating office works.

Knowledge-based Design Lab, Yonsie University

Seoul, South Korea

UNDERGRADUATE RESEARCHER

Jan. 2016 - Aug. 2016

- Participated on the 3D computer vision research (Advisor: Prof. Soo-Hong Lee).

Publications and Patents

Journal Papers

- [J4] H. Lee, J. Lee, S. Kwon, K. Ramani, **H. Chi**, and D. Mun. 3D CAD Model Simplification for Mechanical Parts Using Generative Adversarial Networks. In *Computer-Aided Design*, under review.
- [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. Hwang, S. Lee, **H. Chi**, N. Kang, H. Kong, J. Lu, and H. Ohk. 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.

Conference Proceedings

- [C8] **H. Chi**, S. Chi, Q. Huang, and K. Ramani. Skeleton-ODE: Learning Representation by Predicting the Future for Online Skeleton-based Action Recognition, *International Conference on Computer Vision (ICCV)*, 2023. Submitted.
- [C7] S. Kim, S. Seo, **H. Chi**, K. Ramani, J. Kim, and S. Kim. Higher-order Relation Reasoning for Trajectory Prediction, *International Conference on Computer Vision (ICCV)*, 2023. Submitted.
- [C6] **H. Chi**, K. Lee, N. Agarwal, K. Ramani, and C. Choi. AdamsFormer for Spatial Action Localization in the Future, In proceedings of *Conference on Computer Vision and Pattern Recognition (CVPR)*, 2023.
- [C5] Y. Xu, A. Bazarjani, **H. Chi**, C. Choi, and Y. Fu. Uncovering the Missing Pattern: Unified Framework Towards Trajectory Imputation and Prediction, In proceedings of *Conference on Computer Vision and Pattern Recognition (CVPR)*, 2023.
- [C4] **H. Chi**^{*}, S. Chi^{*}, S. Chan, and K. Ramani. Pose Relation Transformer: Refine Occlusions for Human Pose Estimation, In proceedings of *IEEE International Conference on Robotics and Automation (ICRA)*, 2023.
- [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 Annotated Mechanical Components Benchmark for Classification and Retrieval Tasks with Deep Neural Networks, In proceedings of *European Conference on Computer Vision (ECCV)*, 2020.
- [C1] S. Kim, **H. Chi**, X. Hu, A. Vegesana, and K. Ramani. First-Person View Hand Segmentation of Multi-Modal Hand Activity Video Dataset, In proceedings of *British Machine Vision Conference (BMVC)*, 2020.

Patents

- [P5] **H. Chi**, K. Lee, Y. Xu, and C. Choi. System and Method for Providing Spatio-Temporal Action Localization in the Future. US Patent Application.
- [P4] Y. Xu, A. Bazarjani, **H. Chi**, and C. Choi. Trajectory Imputation and Prediction, US Patent Application.
- [P3] K. Ramani, **H. Chi**, and S. Chi. Pose Relation Transformer Refine Occlusions for Human Pose Estimation. US Patent Application.
- [P2] K. Ramani, S. Kim, and **H. Chi**. Pixel-wise Hand Segmentation of Multi-modal Hand Activity Video Dataset. US Patent 11,562,489 B2.
- [P1] **H. Chi**. Computer Input System for Office/Factory Automation. WO Patent 2018/074729 A1.

Skills

Research and Development Stacks

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

Other Tools and Skills

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

Academic Activities

Reviewer

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

Invited Talks

Keimyung University

Guest Lecturer: LEARNING REPRESENTATION FOR HUMAN ACTION RECOGNITION

Daegu, South Korea

Apr. 2023

Yonsei University

Guest Lecturer: LEARNING REPRESENTATION FOR HUMAN ACTION RECOGNITION

Seoul, South Korea

Apr. 2023

Hongik University

Guest Lecturer: LEARNING REPRESENTATION FOR HUMAN ACTION RECOGNITION

Seoul, South Korea

Dec. 2022

Honors & Awards

2016	KISTI (Korea Institute of Science and Technology Information) President's Award, Edison Challenge – Computer Aided Design Section	Seoul, South Korea
2016	CDE (Korea Society for Computational Design and Engineering) President's Award, CDE Challenge – Computational Design and Engineering Tools Section	Daejeon, South Korea

References

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