

# Seunggeun CHI

✉ sgchi@purdue.edu | 🏠 engineering.purdue.edu/people/seunggeun.chi.1 | 📧 sgchi | 📄 seunggeun-chi-963050153 | 🎓 Seunggeun Chi

## Research Interests

I am deeply passionate about **Machine Learning** and its potential to address real-world challenges. My primary focus is on **Representation Learning** within the realm of **Computer Vision**. Additionally, I have explored **Human Motion Generation**, specifically the integration of **Large Language Models** with **Diffusion Models** to simulate human actions.

## Education

### Purdue University

PH.D. STUDENT IN ELECTRICAL AND COMPUTER ENGINEERING

- *C-Design Lab*, Advisor : Karthik Ramani

[West Lafayette, U.S.](#)

Aug. 2021 - current

### Seoul National University

M.S. IN COMPUTER SCIENCE AND ENGINEERING

- *Optimization Lab*, Advisor : ByungRo Moon

[Seoul, S.Korea](#)

Mar. 2019 - Aug. 2021

### Seoul National University

B.S. IN COMPUTER SCIENCE AND ENGINEERING

- *Computer Architecture Lab*, Advisor : SangLyul Min

[Seoul, S.Korea](#)

Mar. 2013 - Feb. 2019

## Publications & Patents

### Conference Proceedings

- **S. Chi\***, H. Chi\*, Q. Huang, K. Ramani. Skeleton-ODE: Learning Representation by Predicting the Future for Online Skeleton-based Action Recognition. *IEEE Transactions on Pattern Analysis and Machine Intelligence (T-PAMI)*, submitted
- **[C3] S. Chi\***, H. Chi\*, S. Chan, K. Ramani. Pose Relation Transformer: Refine Occlusions for Human Pose Estimation. *IEEE International Conference on Robotics and Automation (ICRA)*, 2023
- **[C2]** H. Chi, M. H. Ha, **S. Chi**, S. Lee, Q. Huang, K. Ramani. InfoGCN: Representation Learning for Human Skeleton-based Action Recognition. *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2022
- **[C1]** M. H. Ha, **S. Chi**, S. Lee, Y. Cha, B. R. Moon. Evolution-based Meta Reinforcement Learning for Portfolio Optimization. In proceedings of the 23rd *The Genetic and Evolutionary Computation Conference (GECCO)*, 2021

### Patent

- K.Ramani, H.Chi, **S.Chi**. Pose Relation Transformer And Refining Occlusions For Human Pose Estimation. U.S. Patent Application (MMB 1743-0299P)

## Skills

### Research and Development Stacks

<b>Major Languages</b>	Python, C/C++, java, Verilog
<b>Machine Learning</b>	PyTorch, TensorFlow
<b>Computer Vision</b>	OpenCV, OpenGL
<b>Web Languages</b>	Nginx, HTML5, PHP, JavaScript, CSS
<b>Database</b>	MySQL, SQLite

### Other Tools and Skills

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

## Research & Project

### Action Diffusion Model: Composing action from text-based input with Diffusion Model

[C-Design Lab, Purdue Univ.](#)

RESEARCH ASSISTANT

Mar. 2023 -

- Aligned motion representation and text representation in the latent space.
- Developed latent diffusion model for effective diffusion process.
- Established novel action composition algorithm.

### Skeleton-based action sequence generation with salient atomic actions

[C-Design Lab, Purdue Univ.](#)

RESEARCH ASSISTANT

Dec. 2022 -

- Encode latent action trajectory with Neural ODE.
- Extract the salient action frames of actions, and define atomic actions with the salient action frames.
- Apply diffusion model to generate continuous action sequences with atomic actions.

## Designing spatial-navigation on chrome-extension

Archilab, Seoul National Univ.

RESEARCH ASSISTANT

Sep. 2018 - Dec. 2018

- formulated malfunctioning cases and defined user-friendly environment
- Developed user-friendly navigation UI
- <https://github.com/WICG/spatial-navigation>

## Academic Activities

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### Reviewer

- The IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2023
- Conference on Neural Information Processing Systems (NeurIPS), 2023
- International Conference on Computer Science and Application Engineering (CSAE), 2023

### Education Outreach

- Gifted Education Research & Resource Institute (GER<sup>2</sup>I), 2022 Summer

## Working Experience

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### SK Hynix

Icheon, S.Korea

INTERN RESEARCHER

Sep. 2017 - Dec. 2017

- Designed an exclusive chip for testing 3D NAND flash architecture and verified the reliability of existing architectures
- Developed a module for predicting locality of data and tested it with real data

### Korean National Police Agency

Dokdo, S.Korea

AUXILIARY POLICE

Dec. 2013 - Sep. 2015

## Teaching Experience

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### Seoul National University

CS.4190.681A **Genetic Algorithm**, 2019-spring, 2021-spring

Teaching Assistant

CS.4190.407 **Algorithm**, 2019-fall, 2020-spring

Teaching Assistant

CS.M1522.407 **Data Structure**, 2019-spring, 2020-spring, 2021-spring

Teaching Assistant

CS.4190.308 **Computer architecture**, 2018-spring

Teaching Assistant

CS.035.001 **Digital Computer Concept and Practice**, 2017-fall, 2018-fall

Teaching Assistant

PE.051.004 **Volley ball**, 2018-fall, 2019-spring, 2021-spring

Teaching Assistant

## Honors & Awards

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### Competition of accelerating General-Purpose GPU sponsored by Intel

Manycore Programming Lab

1ST PLACE

2018

### The National Scholarship for Science and Engineering

Korea Ministry of Science and ICT

FULL SCHOLARSHIP

Mar. 2018 - Aug. 2021

## Invited Talk

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### Yonsei University

Seoul, S.Korea

GUEST LECTURER: REPRESENTATION LEARNING FOR HUMAN ACTION RECOGNITION AND GENERATION

Apr. 2023

### Purdue Interdisciplinary Graduate Programs

West Lafayette

PRESENTER: REPRESENTATION LEARNING FOR HUMAN SKELETON-BASED ACTION RECOGNITION

May. 2023