

GAEUL KWON

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Education

University of Southern California

Master of Science in Computer Science

Los Angeles, California

Aug 2025 - May 2027

Grinnell College

Bachelor of Arts in Computer Science (Minor in Linguistics)

Grinnell, Iowa

Aug 2019 - May 2025

Research Experience

Sensing, Learning, and Understanding for Robotic Manipulation Lab, USC

Graduate Research Assistant

Los Angeles, California

Oct 2025 – Present

- Topics: Robot Manipulation, Vision-Language Models, Human-Robot Interaction

University of Illinois Urbana-Champaign

Undergraduate Research Assistant

Remote

Mar 2024 – Apr 2025

- Designed a comparative prompting framework for in-context learning using PyTorch and Hugging Face Transformers, addressing prompt bias and generalization failure in LLMs.
- Improved classification accuracy by up to **13.8%** across **LLaMA 2/3** and **Flan-T5 XL/XXL**, enabling smaller models to achieve performance comparable to larger baselines.
- Demonstrated that **sparse autoencoder reconstruction loss** provides a strong unsupervised signal for prompt selection, extending SAE utility beyond interpretability to model steering.
- Tech: Python, PyTorch, Hugging Face Transformers, LLM Evaluation

AI and Optimization Lab (PiStar), Texas A&M University

Undergraduate Researcher

College Station, Texas

May 2024 – Aug 2024

- Improved deep reinforcement learning policies for end-to-end autonomous racing using vision-based observations, trained entirely in simulation.
- Trained autoencoder-based visual representations to improve feature transferability between simulated and physical environments.
- Validated sim-to-real transfer without real-world fine-tuning, demonstrating robustness of learned policies to environmental shift.
- Tech: Python, PyTorch, Deep Reinforcement Learning, Sim-to-Real Transfer

Korea University

Undergraduate Research Assistant

Seoul, South Korea

Mar 2021 – Aug 2021

- Developed a **Python-based algorithm** to predict mitochondrial replication origins using GC-skew analysis, k-mer statistics, and conserved sequence motifs.
- Built an automated pipeline to classify and visualize **20,000+ bacterial mtDNA sequences** from NCBI, enabling large-scale comparative analysis.

Industry Experience

PiQuant Co., Ltd.

Firmware Developer

Seoul, South Korea

Jun 2022 – Mar 2023

- Developed firmware for a portable spectroscopic analyzer, improving device reliability and measurement stability.
- Implemented low-level control logic and hardware communication in C on embedded systems.
- Tech: C, Arduino, Embedded Systems

Publications

- [1] Ikhyun Cho, **Gaeul Kwon**, and Julia Hockenmaier. “On the Versatility of Sparse Autoencoders for In-Context Learning”. *Findings of the Association for Computational Linguistics: EMNLP 2025*. URL: <https://aclanthology.org/2025.findings-emnlp.1063/>.
- [2] Ikhyun Cho, **Gaeul Kwon**, and Julia Hockenmaier. “Tutor-ICL: Guiding Large Language Models for Improved In-Context Learning Performance”. *Findings of the Association for Computational Linguistics: EMNLP 2024*. URL: <https://aclanthology.org/2024.findings-emnlp.554>.
- [3] Eleanor Glewwe, Ariana Furlong*, Lu Johnston*, Tanmaie Kailash*, **Gaeul Kwon***, and Zoe Zallek*. “Productivity, Universality, and Cumulativity in Sound Symbolism: A Pokémonastics Study of Georgian and English”. *Submitted to Laboratory Phonology, Presented at Annual Meeting on Phonology 2024*.

* indicates the student co-authors

Academic Leadership & Service

Graduate Research Seminar (GRS)

Co-Founder & Organizer

Los Angeles, California

Sep 2025 – Present

- Co-founded an unofficial, student-led research seminar for Korean graduate students in STEM fields across USC and other institutions.
- Organize weekly research seminars to foster an open environment for discussing research ideas, emerging trends, and interdisciplinary perspectives.
- Facilitate research presentations and discussions to help participants clarify research directions and strengthen English scientific communication skills.
- Grew the community to over **40 graduate researchers**, with **10 active participants** attending regular weekly meetings.

Teaching Experience

Department of Computer Science at Grinnell College

Grinnell, Iowa

Course Assistant

Spring 2022, Fall 2023, Spring 2024, Spring 2025

- Graded weekly labs, assignments, and quizzes for six undergraduate classes (a total of 136 students)
- Provided personalized feedback to students to increase their code efficiency and brevity.
- Worked closely with the professors to organize the rubrics and ensure students' clear understanding of learning objects.
- Courses: Computer Organization and Architecture (Spring 2024, 2025), Analysis of Algorithms (Spring 2024), Functional Problem Solving (Fall 2023), Objected-Oriented Problem Solving, Data Structure/Algorithms (Spring 2022)

Alternative Language Study Option (ALSO) at Grinnell College

Grinnell, Iowa

Peer Instructor

Spring 2020, Fall 2023, Spring 2024

- Tutored three Korean introductory classes, helping the students to practice daily conversation and develop oral skills. All students got more than 90% in their final oral evaluations.
- Created course plans and relevant interactive activities to help students improve their Korean language proficiency.
- Led individual tutoring sessions to provide personalized feedback and guidance to students.
- Worked closely with the professor and other ALSO tutors to share class contents, teaching methods, and feedback.

Awards & Fellowships

Research Experiences for Undergraduates (REU), National Science Foundation (NSF)

May 2024 – Aug 2024

Founder's Scholarship, Grinnell College

Aug 2019 – May 2025