

# Jiwoong (Andy) Sohn

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## EDUCATION

### Korea University

*Master of Science*

Sep. 2023 - Aug. 2025

*Early Completion*

- Major: Computer Science and Engineering
- GPA: 4.44/4.5 (Merit-based Scholarship)
- Advisor: [Jaewoo Kang](#)

### Korea University

*Bachelor of Science, Bachelor of Engineering*

Mar. 2016 - Aug. 2023

- Double Major: Health and Environmental Science, Artificial Intelligence
- Minor: Computer Science and Engineering
- GPA: 4.0/4.5

## PUBLICATIONS

### MedAgentsArena: Benchmarking Thinking Models and Agent Frameworks for Complex Medical Reasoning

Feb. 2025

Xiangru Tang, Daniel Shao, [Jiwoong Sohn](#), Jiapeng Chen, Jiayi Zhang, Jinyu Xiang, Fang Wu, Yilun Zhao, Chenglin Wu, Wenqi Shi, Arman Cohan, Mark Gerstein  
*Under Review at ACL 2025*

### Rationale-Guided Retrieval Augmented Generation for Medical Question Answering

Aug. 2024

[Jiwoong Sohn](#), Yein Park, Chanwoong Yoon, Sihyun Park, Mujeen Sung, Hyunjae Kim, Jaewoo Kang  
[NAACL 2025](#)

### Small Language Models Learn Enhanced Reasoning Skills from Medical Textbooks

Mar. 2024

Hyunjae Kim, Hyeon Hwang, Jiwoo Lee, Sihyeon Park, Dain Kim, Taewhoo Lee, Chanwoong Yoon, [Jiwoong Sohn](#), Donghee Cho, Jaewoo Kang  
[arXiv:2404.00376 \(2024\)](#) - *Under Review at NPJ Digital Medicine*

### Improving Medical Reasoning through Retrieval and Self-Reflection with Retrieval-Augmented Large Language Models

Jan. 2024

Minbyul Jeong, [Jiwoong Sohn](#), Mujeen Sung, Jaewoo Kang  
[ISMB 2024, Bioinformatics 2024](#) (Oral and Poster)

### KU AIGEN ICL EDI@BC8 Track 3: Advancing Phenotype Named Entity Recognition and Normalization for Dysmorphology Physical Examination Reports

Nov. 2023

Hajung Kim, Chanhwi Kim, [Jiwoong Sohn](#), Tim Beck, Marek Rei, Sunkyu Kim, T. Ian Simpson, Joram M. Posma, Antoine Lain, Mujeen Sung, Jaewoo Kang  
[AMIA 2023, Proceedings of the BioCreative VIII Challenge and Workshop](#)

## MANUSCRIPTS IN PREPARATION

### Shepherd: Optimizing Medical Multi-Agent Systems via Monte Carlo Tree Search

2025

[Jiwoong Sohn](#)<sup>†</sup>, Xiangru Tang<sup>†</sup>, Yanjun Shao<sup>†</sup>, Hyungsoon Hwang<sup>†</sup>, Nikhil Khandekar, Sihyun Park, Jiwoo Lee, Mark Gerstein, Mujeen Sung, Jaewoo Kang

### Medical Agentic RAG: A Multi-Agent Framework for Clinical Decision Support

2025

[Jiwoong Sohn](#)<sup>†</sup>, Xiangru Tang<sup>†</sup>, Yanjun Shao, Jaewoo Kang, Mark Gerstein

### A Systematic Validation Framework for Medical Retrieval-Augmented Generation Systems

2025

Hyunjae Kim, Jiwoong Sohn, Qingyu Chen

## MCTS-Guided Factual Verification for Process-Level Reward Modeling in Medical Reasoning

2025

Yoon Jae Hoon†, Jiwoong Sohn†, Xiangru Tang, Yanjun Shao, Hyunjae Kim, Mark Gerstein, Jaewoo Kang

## RESEARCH EXPERIENCE

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Yale University | Gerstein Lab [🔗](#)

Aug. 2024 - Present

Research Intern (Advisor: [Mark Gerstein](#), Mentor: [Xiangru Tang](#))

### • Medical Multi-Agent System for Clinical Decision Support

- Developed a multi-agent system for precise clinical decision making, integrating collaborative agent protocols with retrieval-augmented generation.
- Optimizing medical knowledge synthesis through dynamic agent interactions, combining Large Language Model's parametric knowledge with dense vector retrieval from PubMed and clinical databases.
- Two manuscript in preparation for submission to *Nature Medicine* and *ACL 2025*.

Yale University | Qingyu Chen's Lab [🔗](#)

Dec. 2024 - Present

Research Assistant (Advisor: [Qingyu Chen](#), Mentor: [Hyunjae Kim](#))

### • Systematic Validation of Medical Retrieval-Augmented Generation System

- Designing a comprehensive evaluation pipeline for RAG systems in clinical settings with fine-grained metrics across evidence retrieval, attribution, and response validation to assess factuality, completeness, and accuracy.
- Conducting evaluation with human medical experts and large language models (LLMs), generating publicly available annotations to benchmark evidence reliability and model performance.

Korea University | Data Mining and Information Systems Laboratory [🔗](#)

Sep. 2023 - Present

Research Assistant (Advisor: [Jaewoo Kang](#))

### • Open-Source Medical Foundation Model

- Developed the first open-source medical foundation model in 7B parameters capable of passing the USMLE.
- Employed the Unstructured library to extract and chunk text data from medical textbooks for fine-tuning.

### • Retrieval-Augmented Language Model with Self-Reflection for Enhanced Medical Reasoning

- Instruction-tuned LLaMA2 to self-reflect on its generation while effectively utilizing retrieved documents, achieving state-of-the-art performance on medical QA benchmarks.
- Utilized an off-the-shelf dense retriever, MedCPT, to index a large-scale medical text corpus.

### • Rationale-Guided Retrieval Augmentation Framework

- Designed a comprehensive retrieval system using rationale-guided approaches for query reformulation during pre-retrieval, balanced corpus sampling, and post-retrieval validation.
- Developed a neural filtering model using perplexity-derived pseudo-labels for optimized retrieval from diverse medical knowledge bases.

Korea University | Data Mining and Information Systems Laboratory

Mar. 2023 - Aug. 2023

Research Intern (Advisor: [Jaewoo Kang](#))

### • BioCreative8 Track 3: Phenotype Named Entity Recognition and Normalization

- Conducted error analysis on named entity recognition (NER) and entity linking (EL) methods, improving F1 score by 2.6% over the challenge average.
- Implemented data augmentation techniques, including synonym marginalization, to enhance entity normalization accuracy and strengthen consistency in mapping to Human Phenotype Ontology (HPO) terms.

## HONORS AND AWARDS

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<b>Integrated Bachelor's and Master's Scholarship (50% Tuition)</b> – Awarded based on GPA of 4.0 or above in both Bachelor's and Master's degrees	Sep. 2023 - Feb. 2025
<b>Early Completion</b> – Awarded based on GPA of 4.0 or above in both Bachelor's and Master's degrees	Sep. 2023 - Feb. 2025
<b>[ACL 2024 BioNLP Workshop] Shared Task on Clinical Text generation</b> – Top Performing Teams	May 2024
<b>[LG Electronics] iPBL Competition</b> – 2nd Prize, 5,000 USD (Monetary Award and Prizes)	Feb. 2024
<b>[Biocreative VIII Track 3] Genetic Phenotype Extraction and Normalization from Dismorphology Physical Examination Entries</b> – 3rd Prize	Sep. 2023
<b>Semester High Honors</b>	Fall 2020, Fall 2019
<b>SDGs Innovation Arduino-based Technology Competition</b> – 2nd Prize	Dec. 2020

## TEACHING EXPERIENCE

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<b>SW Programming Basics (GECT002)</b> <i>Teaching Assistant</i>	Spring 2024
<b>Machine Learning (COSE362)</b> <i>Teaching Assistant</i>	Fall 2023
<b>Advanced Data Science for Finance (DFE620)</b> <i>Teaching Assistant</i>	Fall 2023
<b>Python Programming for Everybody (COSE156)</b> <i>Teaching Assistant</i>	Fall 2020
<b>Private Academies and Tutoring</b> <i>Physics and Math Instructor</i>	2016 - 2023

## TECHNICAL SKILLS

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**Programming:** Python, C, Matlab, Verilog  
**Toolkits:** PyTorch, Hugging Face, LangChain, Scikit-Learn, NumPy, Pandas, Faiss, Milvus  
**Other:**  $\LaTeX$ , Blender, Arduino  
**Certificates:**

- Certification of Advanced Data Analytics Semi-Professional (2022)
- AI Certificate for Everyone (AICE) - Associate (2022)

## LEADERSHIP AND EXTRACURRICULAR ACTIVITIES

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<b>Korea University   Buddy Assistants (KUBA)</b> <i>Group Leader</i> <ul style="list-style-type: none"><li>• Led and organized volunteer activities for over 300 international exchange students, demonstrating strong leadership and cross-cultural communication skills to support their adaptation to Korea University life.</li><li>• Coordinated International Student Festival booths (France, Japan, Thailand), securing consecutive 1st place wins</li></ul>	Aug. 2022 - Dec. 2023
<b>KT   AIVLE School AI Developer Track</b> <ul style="list-style-type: none"><li>• Engineered an audio-to-3D dance generation platform using a transformer model and Blender as a capstone project for KT's selective AI Developer Program.</li></ul>	Jul. 2022 - Jan. 2023
<b>Korea University   Korea University Rowing Team</b> <ul style="list-style-type: none"><li>• Collaborated closely with team rowers, participated in rigorous training sessions to build</li></ul>	Jul. 2020 - Jan. 2021

team cohesion and endurance.

**Korea University | Disease Study Society**

Mar. 2019 - Dec. 2019

*Treasurer, Academic Member*

- Led weekly disease research seminars and managed society finances, including budget planning and transparent fund allocation for academic events

**Republic of Korea Air Force | Compulsory Military Service**

Apr. 2017 - Apr. 2019

*Honorary Discharge as Staff Sergeant*

- Served in Gyeryongdae (Joint Forces Command HQ) Support Group
- Took a leave of absence from the Bachelor's Program to fulfill military service duties.

## ACADEMIC SERVICE

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**EMNLP 2024**

*Secondary Reviewer*

## LANGUAGE

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**Korean** (Native)

**English** (C2)

- TOEFL: 111 (MyBest Scores: 115)
- TOEIC: 970
- TOEIC Speaking: 200

**German** (A1)