Jiwoong (Andy) Sohn

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EDUCATION

ETH Zurich May. 2025 - Present
Doctor of Science
- *Major*: Medical AI
- Advisor: Michael Moor

Korea University Sep. 2023 - Feb. 2025
Master of Science *Early Completion*
- *Major*: Computer Science and Engineering
- GPA: 4.44/4.5 (Merit-based Scholarship)
- Advisor: Jaewoo Kang

Korea University Mar. 2016 - Aug. 2023
Bachelor of Science, Bachelor of Engineering
- *Double Major*: Artificial Intelligence, Health and Environmental Science
- *Minor*: Computer Science and Engineering
- GPA: 4.0/4.5

PUBLICATIONS

MedAgentsBench: 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
arXiv:2503.07459 (2025) - *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
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

Optimization of Multi-Agent Systems 2025
Jiwoong Sohn†, Xiangru Tang†, Yanjun Shao†, Hyungsoon Hwang†, Nikhil Khandekar, Mark Gerstein

Medical Agentic RAG 2025
Jiwoong Sohn†, Xiangru Tang†, Yanjun Shao, Jaewoo Kang, Mark Gerstein

Validation Framework for Medical Retrieval-Augmented Generation Systems 2025
Hyunjae Kim, **Jiwoong Sohn**, Qingyu Chen

Process-Level Reward Modeling 2025
Yoon Jae Hoon†, **Jiwoong Sohn**†, Xiangru Tang, Yanjun Shao, Hyunjae Kim, Mark Gerstein, Jaewoo Kang

RESEARCH EXPERIENCE

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.
  - Conducteing 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

Integrated Bachelor's and Master's Scholarship (50% Tuition) Sep. 2023 - Feb. 2025
– Awarded based on GPA of 4.0 or above in both Bachelor's and Master's degrees

Early Completion Sep. 2023 - Feb. 2025
– Awarded based on GPA of 4.0 or above in both Bachelor's and Master's degrees

[ACL 2024 BioNLP Workshop] Shared Task on Clinical Text generation May 2024
– Top Performing Teams

[LG Electronics] iPBL Competition Feb. 2024
– 2nd Prize, 5,000 USD (Monetary Award and Prizes)

[Biocreative VIII Track 3] Genetic Phenotype Extraction and Normalization from Dysmorphology Physical Examination Entries Sep. 2023
– 3rd Prize

Semester High Honors Fall 2020, Fall 2019

SDGs Innovation Arduino-based Technology Competition Dec. 2020
– 2nd Prize

TEACHING EXPERIENCE

SW Programming Basics (GECT002) Spring 2024
Teaching Assistant

Machine Learning (COSE362) Fall 2023
Teaching Assistant

Advanced Data Science for Finance (DFE620) Fall 2023
Teaching Assistant

Python Programming for Everybody (COSE156) Fall 2020
Teaching Assistant

Private Academies and Tutoring 2016 - 2023
Physics and Math Instructor

TECHNICAL SKILLS

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

Korea University | Buddy Assistants (KUBA) Aug. 2022 - Dec. 2023
Group Leader

- 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.
- Coordinated International Student Festival booths (France, Japan, Thailand), securing consecutive 1st place wins

KT | AIVLE School AI Developer Track Jul. 2022 - Jan. 2023
- 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.

Korea University | Korea University Rowing Team Jul. 2020 - Jan. 2021
- Collaborated closely with team rowers, participated in rigorous training sessions to build 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

EMNLP 2024
Secondary Reviewer

LANGUAGE

Korean (Native)

English (C2)
- TOEFL: 111 (MyBest® Scores: 115)
- TOEIC: 970
- TOEIC Speaking: 200

German (A1)