Jun Hyeong Kim

Gwanakgu, Seoul

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Education

Seoul National University   Seoul, South Korea
M.S., Interdisciplinary Program in Artificial Intelligence   *September 2022 – August 2024*

- **MS Thesis**: In silico prioritizing system for phenotype-related genes from mouse KO event using PU learning on biological network
- **Advisor**: Sun Kim

Yonsei University   Seoul, South Korea
B.S., Biotechnology   *March 2016 – August 2022*

Publications

*Ha S., ***Kim J.**, Piao Y., & Kim S., MV-CLAM: multi-view molecular interpretation with cross-modal projection via language model. (*under revision*)

***Kim J.**, *Koo B., & Kim S., PONYTA: prioritization of phenotype-related genes from mouse KO events using PU learning on a biological network. *Bioinformatics*. 2024 Oct.

Conferences

*Ha S., ***Kim J.**, Piao Y., & Kim S., "MV-CLAM: multi-view molecular interpretation with cross-modal projection via language model", NeurIPS 2024 WorkShop: *AI for New Drug Modalities*, Vancouver, Canada - *Poster presentation (Accepted)*

***Kim J.**, *Koo B., & Kim S., "PONYTA: prioritization of phenotype-related genes from mouse KO events using PU learning on a biological network", 2024 Annual Conference of Korean Society for Bioinformatics (BIOINFO2024), Gyeongju, South Korea - *Poster presentation*

Project Experience

Molecule description generation using multi-dimension structural information
Team Leader   *March 2024 – Present*

- Project in Creative and Independent AI Research course of Interdisciplinary Program in Artificial Intelligence
- Integrating both 3D and 2D molecule structural representation as a text-space aligned information for language model with a novel cross-modal projector
- Achieved competitive performance within text retrieval task and molecule captioning
- Registered the copyright for the developed model framework (MVCLAM)

Phenotype-related gene prioritization for mouse gene knockout
Team Leader   *November 2023 – August 2024*

- Prioritized genes associated with phenotypic outcomes in gene knockout events.
- Applied PU learning on biological networks, using a subset of DEG and NP genes as positive inputs to rank unlabeled genes based on their phenotypic relevance.
- Leveraged gene expression changes and the topological structure of gene interaction networks to effectively identify phenotype-related genes.
- Achieved competitive results compared to baseline models for gene prioritization tasks.

CRY1: Mitochondria Quality Controller
Team Member   *October 2023 – December 2023*

- Collaborative project with Laboratory of Adipocyte and Metabolism Research
- Research on novel function of Cry1 gene in mitochondria morphology and heat generation in BAT
- Identification of genes related to Cry1 gene via gene prioritization method

Diagnosis of Prostate Cancer Patients via Odorant Receptor
Team Member   *February 2023 – December 2023*

- Collaborative project with Receptor Convergence Technology Laboratory
- Classification on fluorescence data from odorant receptors for accurate prostate cancer diagnosis
- Identification of optimal odorant receptor combinations and classification using multiple machine learning algorithms

Jump AI 2023
Team Member   *August 2023 – September 2023*

- AI Drug Development Competition hosted by Dacon
- Prediction on compound metabolism stability using 3,498 data points
- Ranked in the top 5%

Internships

Bio & Health Informatics Lab   Seoul National University
Undergraduate Researcher   *June 2022 – August 2022*

- Advisor: Sun Kim
- Analysis of ADMET biochemical data acquisition and dataset evaluation

NetBio Lab   Yonsei University
Undergraduate Researcher   *December 2021 – May 2022*

- Advisor: Insuk Lee
- Pangenome components analysis using classification tools for identification of persistent, shell, cloud genomes

Stem Cell & Biomaterial Engineering Lab   Yonsei University
Undergraduate Researcher   *June 2021 – November 2021*

- Advisor: Seung Woo Cho
- Enhancing the vascularization and maturation of brain organoids

Teaching Experience

Seoul National University   Seoul, South Korea
Teaching Assistant   *September 2024 – Present*
Computer Convergence Application (CCA)

- Delivered lecture and led assignment on Python & PyTorch Tutorial and Decision Tree algorithm

Seoul National University   Seoul, South Korea
Teaching Assistant   *March 2024 – June 2024*
Introduction to IT for Bioinformatics

- Conducted grading for midterm and final exams and managed student inquiries

AI Institute of Seoul National University, AIIS   Seoul, South Korea
Lead Teaching Assistant   *September 2023 – December 2023*
AI-BIO Research Personnel Training Program

- Assisted in the preparation and delivery of lectures on the following topics: *Life Sciences, Drug Development, Basics of Artificial Intelligence, Bioinformatics, AI-Driven Drug Development*

Seoul National University   Seoul, South Korea
Teaching Assistant   *September 2023 – December 2023*
Computer Convergence Application (CCA)
- Delivered lecture and led assignment on Decision Tree algorithm

Awards & Scholarships

Research Achievement Scholarship   Seoul National University, 2024-08
Interdisciplinary Program in Artificial Intelligence $2,222
Academic Excellence Award   Yonsei University, 2021-08
Academic Excellence Scholarship   Yonsei University, 2021-08
Cheongwoo Scholarship $3,250
Academic Excellence Award   Yonsei University, 2021-02
Academic Excellence Scholarship   Yonsei University, 2021-02
Jinri Scholarship $2,165
Academic Excellence Scholarship   Yonsei University, 2021-02
Geonseon Scholarship $925
Honors Award   Yonsei University, 2020-08