Wongyung Choi

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Education

Minerva University, BSc	Sep 2024 – May 2028
Seoul National University, BSc, DVM candidate	Mar 2022 – Dec 2023
Daejeon Science High School for the gifted, High school diploma	Mar 2019 – Feb 2022

Publications

Google Scholar profile: https://scholar.google.com/citations?user=3S9QbyEAAAAJ

A machine learning approach using conditional normalizing flow to address extreme class imbalance problems in personal health records　　May 2024

Yeongmin Kim*, **Wongyung Choi***, et al., Younghee Lee# [*Co-first author]

BioData Mining, 2024 May 25 (IF: 4.079)

Development of a Multi-Agent Clinical Decision Support System for Korean Triage and Acuity Scale (KTAS)-Based Triage and Treatment Planning in Emergency Department　　Aug 2024

Seungjun Han, **Wongyung Choi#** [#Corresponding Author]

arXiv preprint, 2024 Aug 14

Projects

MK-Biology: Platform for Innovation on Research & Education (R&E) to Foster the Next-generation BioTechnology Stars (BTS)　　Sep 2024 – Present

- Advisor: Siyeon Rhee, Ph.D. (Instructor, Stanford Medicine, Co-Founder and Representative Operating Committee in K-BioX)
- Combining the innovative educational pedagogy of Minerva University with the extensive network of K-BioX, aims to foster the next generation of BioTechnology Stars (BTS) by creating a unique Research & Education (R&E) ecosystem that pursues collaboration and innovation to lead the future of biomedical sciences.

Analysis characteristics and inhibition mechanism of tumor microenvironment (TME) through the study of interaction between pancreatic cancer and cancer associated fibroblast (CAF)　　Nov 2023 – Jul 2024

- Collaborating with Yonsei University College of Medicine
- Analyzing single cell RNA-seq (scRNA-seq) data from pancreatic ductal adenocarcinoma (PDAC) mouse model (syngeneic model and patient-derived xenograft (PDX))

Genome Korea in Ulsan Project　　Dec 2023 – Sep 2024

- Collaborating with The Korea Genomics Center (KOGIC) at UNIST
- Analyzing large-cohort genome data with Genome-Wide Association Study (GWAS) and machine learning

Application of Large Language Models in Developing Pet-Companion-Friendly Veterinary Services　　Dec 2023 – Present

- Poster presentation at The Korean Society of Veterinary Science (KSVS) conference (2024 spring).

Cultivating Medical Big Data Convergence Professionals　　Jun 2022 – Dec 2023

- Participating researcher
- Performed with Medical Big Data Research Center (MBRC), Seoul National University

Preclinical Experiment Data Support Project　　Jun 2022 – Dec 2023

- Participating researcher

- Performed with Korea Mouse Phenotyping Center (KMPC)
- Contributed to developing Laboratory Information Management System (LIMS) for infectious disease research.
- Contributed to developing data visualization portal for infectious disease research (http://preclinical.kr/portal/main/indexPage.do#Num0)

A machine learning approach using conditional normalizing flow to address extreme class imbalance problems in personal health records　　Jun 2022 – Oct 2023

- Project leader
- Oral presentation at The Korean Society of Medical Informatics (KOSMI, 2022 Fall Conference)
- Publication at BioData Mining (IF: 4.079)

The National Project of Bio Big Data (pilot-phase)　　Jul 2022 – Nov 2022

- Participating researcher
- Personal Health Records (PHRs) analysis
- Prediction of chronic disease using machine learning
- Standardization of Health Information using FHIR and SNOMED CT

Research Experience

Undergraduate Research Fellow, College of Veterinary Medicine, **Seoul National University**　　Jun 2022 – Present

- Laboratory of Veterinary Informatics and Bioinformatics (Advisor: Prof. Younghee Lee, Ph.D.)
- Research topics: Bioinformatics, Medical informatics, Veterinary Informatics
- High performance computing (HPC) server manager

Work Experience

Student Intern, **Adobe**　　Oct 2024 – Present

- Co-Curricular project: "How might we design the workplaces of tomorrow that meet the evolving and diverse needs of employees while ensuring a sense of community, support, and connection?"

Griffins, **K-BioX**　　Sep 2024 – Present

- One of the largest Korean biomedical scientists community, with >13K members
- Global Research & Education Project: MK-Biology
- Operating staff at "Rutgers University Partnership Day in Korea"

Research Assistant Intern, **Minerva University**　　Sep 2024 – Present

- Minerva psychology lab and IRB
- Minerva Online Pedagogy Project (MOPP)

Conference Presentations

US-Korea Conference　　2024

Oral presentation: Application of Large Language Models in Developing Pet-Companion-Friendly Veterinary Services

The Korean Society of Veterinary Science (KSVS) Spring Conference　　2024

Poster presentation: Application of Large Language Models in Developing Pet-Companion-Friendly Veterinary Services

The Korean Society of Medical Informatics (KOSMI) Fall Conference　　2022

Oral presentation: Novel approach with normalizing flow to optimize extreme class imbalance problems on personal health record

Seoul National University College of Veterinary Medicine And Research Institute for Veterinary Science ERD-day (Education, Research and Development Day) conference　　2022

Poster presentation: Novel approach with normalizing flow to optimize extreme class imbalance problems on personal health record

Technical Skills

Computer science:

- Python programming – Data analysis, workflow management, and parallel computing with Ray
- R programming – Bioconductor, data analysis, statistical analysis, and visualization
- Data Science – Application of machine learning and deep learning (scikit-learn, pytorch, langchain, etc.), SQL, and large dataset manipulation
- BASH scripting – Data processing, system monitoring, and automation
- Linux system administration – Software and operating system management on multi-user server environments
- High performance computing (HPC) – Job scheduling (SLURM), software engineering with Docker and Singularity
- Version control – git and GitHub for project management
- Cloud computing – Google GCP and Microsoft Azure

Biology:

- Workflows - Nextflow
- NGS analysis – RNA-seq, single-cell/nucleus RNA-seq, whole-genome sequencing
- Single cell transcriptomics –Seurat and Scanpy, cell typing, DEG analysis, etc.
- Population genetics – Biobank scale data analysis, variant calling, and GWAS
- Medical informatics – Data standardization, common data model, FHIR, and SNOMED-CT

Awards and Honors

People's Choice Award, NASA Space Apps Challenge Mountain View   Oct 2024

NASA

ERD-day (Education, Research and Development Day) conference, field of Veterinary Etiology and Preventive Veterinary Science, Excellent Poster Presentation Award   Dec 2022

College of Veterinary Medicine And Research Institute for Veterinary Science, Seoul National University

16th Asia-Pacific Conference on Giftedness (APCG), Biology Division, Gold Medal   Nov 2020

Asia-Pacific Conference of Giftedness

7th National Infinite Imagination Science Exploration Survival Competition, Grand Prize   Nov 2020

Gyeongsangbuk-do Superintendent of Education

Advanced Problem Solving Contest, Biology Division, Gold Medal   Jul 2021

Daejeon Science High School for the gifted

Korea Middle Chemical Competition (KMChC), Gold Medal   Sep 2019

Korean Chemistry Olympiad (Korean Chemical Society)

Teaching (Volunteer) Experience

Teaching Assistant, College of Veterinary Medicine, Seoul National University   Sep 2023 – Dec 2023

- Undergraduate TA of Veterinary Informatics and Veterinary Statistics

Student Mentor, Chungbuk-SNU Science/Career Mentoring Project   Jun 2023 – Oct 2023

- College of Education, Seoul National University & Korea Foundation for the Advancement of Science and Creativity
- Students who have graduated from Science High School for the gifted, Science High School, or have participated in the International Science Olympiad provided mentoring activities to students in non-metropolitan areas.
- Poster presentation at The Korean Society for School Science (KoSSS) with my mentee (2023 fall).

Student Mentor, SNU Science Prodigy Social Contribution Project (pilot-phase)   Nov 2022 – Feb 2023

- College of Education, Seoul National University & Korea Foundation for the Advancement of Science and Creativity
- Students who have graduated from Science High School for the gifted, Science High School, or have participated in the International Science Olympiad provide mentoring in science to students in non-metropolitan areas.

Extracurricular Activities

Engineers and Scientists for Change (ESC)   Present

- Member of Student Committee and International Academic Committee
- Pursue better science and a better world together.
- We carry out various educational and cultural activities to ensure that scientific thinking and rationality are ingrained in Korean society, and work in solidarity with civil society to design a sustainable future for Korean society.

Seoul National University General Students' Association Ad Hoc Committee to Address Government R&D Budget cuts   Oct 2023 – Dec 2023

Committee Member

BCSC (Brain and Cognitive Science Community)   Feb 2022 – Aug 2022

Student Initiative Member