Nayoung Ku

558, Handong-ro, Buk-gu, Pohang-si, Gyeongsangbuk-do, Republic of Korea 37554

Phone: +82-10-8131-0702 Email: nayoungku1@gmail.com

Interest

- 💻 Big data analysis & modeling, deep learning, statistics
- ⛓️ MLOps, data engineering
- 🧠 Neuroscience, computational biology

Education

BS in Life Science & BE in AI Interdisciplinary Studies (In Progress)

Handong Global University, Pohang, North Gyeongsang, South Korea | Feb 2023 - Present

BA in Psychology

National Institute for Lifelong Education, Seoul, South Korea | Feb 2021 - Feb 2023

Received the degree via Bachelor's Degree Examination for the Self-Education System during high school years

Skills

💡 Creativity & Analytical mind

Technologies

⚙️ Python, R, SQL

⚙️ ML, DL, Optimisation

Languages

Korean (Native)

💡 Interdisciplinary Approaches	⚙️ NLP, Computer Vision	English (TOEFL iBT 97)
💡 Algorithmic Thinking	⚙️ Linux, HPC	

Work Experiences

Teaching Assistant, AI Programming Application

Handong Global University, Pohang | Mar 2025 - Present

- Assisting Professor Sangsan Lee's "AI Programming Application" course by facilitating Q&A sessions and leading discussions for 30+ students in the School of Mechanical and Control Engineering, enhancing their understanding of AI-driven programming.
- Guiding students in implementing Python-based AI projects, focusing on data preprocessing and model development
- Developing instructional materials to clarify machine learning and deep learning concepts, fostering skills in tools like Pandas, Scikit-Learn, and Keras.

Teaching Assistant, Big Data Modelling and Platform

Handong Global University, Pohang | Mar 2025 - Present

- Assisting Professor Jaeyoung Chun's "Big Data Modelling and Platform" course at the School of Applied Artificial Intelligence, supporting 30+ students in mastering big data tools like SQL, NoSQL, and Docker for large-scale data analysis using high-performance computing (HPC).
- Managing troubleshooting technical issues for hands-on labs, ensuring seamless access to computational resources.
- Providing feedback on student assignments involving data modelling enhances their ability to derive insights from complex datasets.

Undergraduate Student Researcher @CCADD

Seoul National University, Seoul | On-site → Remote | Jan 2025 - Apr 2025

- Center of Convergence Approach for Drug Development (CCADD), at the Graduate School of Convergence Science and Technology, affiliated with Seoul National University and Seoul National University Hospital
- Designed preprocessing algorithms and score metrics for machine translation tailored for regulatory pharmaceutical documents, as a part of the Ministry of Food and Drug Safety R&D project

Exchange Student Helper

Handong Global University, Pohang | On-site | Aug 2024 - Dec 2024

- Helped 9 exchange students from 4 countries, facilitating their adaptation to Korean culture, university life, and RC culture through weekly meetings and campus support.
- Acted as a liaison between students and the Office of International Affairs, ensuring clear communication and resolving cultural and logistical challenges.

Undergraduate Student Researcher @Biodata Lab

Handong Global University, Pohang | Internship | On-site | Mar 2024 - Aug 2024

- Developed machine learning models for cancer diagnosis using tumour-educated platelet (TEP) RNA sequencing data
- Capstone project: Cancer diagnostic model using natural language processing for TEP RNA-seq data (Nov 2024)
- Propose novel approaches for the feature engineering process.

Teaching Assistant, Python Programming Camp

Incheon Beauty Arts High School, Incheon | On-site | Aug 2023

- Supported a week-long Python programming camp for elementary to high school students, assisting instructors in delivering coding lessons to participants.
- Guided students through hands-on Python exercises, troubleshooting code, and explaining data structures to accelerate their learning progress.

Key Projects

Participant, Lung Cancer Pathological Image Analysis for Tumorous Segment Classification in WSI

University of Nevada, Las Vegas (UNLV) | July 2025

- Developed a data preprocessing algorithm (a patch tiling & filtering) and a data storage strategy
- Developed a ViT-based classifier model showing high performance (recall=0.99) in a binary classification test using a ViT + LSTM model
- Advised by Dr. Kang from DataX Lab at the Department of Computer Science, UNLV
- https://github.com/nayoungku1/UNLV-histopathology & https://huggingface.co/datasets/nayoungku1/npz-histopathology-dataset/tree/main (storing Preprocessed Data)

Participant, Circulating Tumor Cell Detection in Microscopy Image

Team 5Billion (for Startup Collaboration), Pohang | July 2025

- Collaborated in strategic planning meetings to drive innovative solutions for a cutting-edge biomedical imaging project.
- Conducted literature research to inform project development and performed data annotation using Roboflow, enhancing dataset quality for machine learning applications.

- Provided versatile team support

Language-Model-Based RNA-seq Data ETL Workflow for Ovarian Cancer Classification Model

Handong Global University, Pohang | Oct 2024 - Dec 2024

- Designed and implemented a novel ETL pipeline for RNA-seq data, leveraging language model techniques to process raw nucleotide sequences for ovarian cancer classification.
- Tokenized gene-level sequences and applied pretrained transformer models (ProtBERT) to generate contextual embeddings, enhancing feature representation for downstream analysis.
- Developed and trained a Bi-LSTM network to classify cancerous versus non-cancerous samples, achieving an AUC of 0.7067 on the test set.

Participant, JUMP AI 2024 - AI Drug Discovery Competition

Team Nabi, Pohang | Aug 2024 - Oct 2024

- About Competition
  - Hosted by Korea Pharmaceutical and Bio-Pharma Manufacturers Association Convergence AI Institute for Drug Discovery and Sponsored by the Ministry of Health and Welfare, Korea Health Industry Development Institute, and Daewoong Pharmaceutical Co., Ltd.
  - Objectives: Developing a prediction model using 1,952 training data for IRAK4 IC50
- My Role: data preprocessing, feature engineering, traditional machine learning modelling
- We developed a multilayer perceptron (MLP) model to predict IRAK4 inhibitor activity (IC50) from SMILES data with feature generation strategies and a score metric.
- Placed 3rd among 1,600+ participants in a nationwide competition

Project Leader, Simulating the Mathematical Model of Mammalian Circadian Rhythm

Handong Global University, Pohang | Apr 2024 - Jun 2024

- Led a project simulating the mammalian circadian rhythm model based on research by Jae Kyoung Kim and Daniel B. Forger as a part of the Systems Biology course
- Applied systems biology and mathematical modelling to verify models and build simulation environments
- Collaborated with team members, gaining experience in systems biology, computational modelling, and teamwork

Participant, Finding the Best Concert Tour Schedule using Genetic Algorithm

Handong Global University, Pohang | Apr 2024 - May 2024

Participant, Finding the Optimal Candidate Locations of Vertiports for Hospital Accessibility in Korea using K-Means

Handong Global University, Pohang | Nov 2023

Participant, National University Student Biology Symposium

Seoul National University, Seoul | Jul 2023 - Aug 2023

- The National University Student Biology Symposium(NUSB) is a student-led summer academic symposium held annually where students from all over the country interested in life science gather to read scientific papers on one topic and study together.
- At the 62nd NUSB, I participated in Subdivision 1 with the theme "Microbial Metabolism and Biotechnology," focusing on microbial metabolites in humans,

plants, and biotechnology applications.

- Presented the paper "Antioxidant Enzymes in Chickpea Colonized by Piriformospora indica Participate in Defense against the Pathogen Botrytis cinerea" in the seminar, which was about plant and rhizosphere microbiome interaction.

Study on the Effects of Auditory Encoding and Visual Encoding in Recognizing English Vocabulary

Dream School, Seosan | Aug 2022 - Nov 2022

- Investigated the effects of auditory encoding vs. visual encoding on English vocabulary recognition and retention.
- Employed theoretical backgrounds in memory, cognition, speech perception, and visual word recognition.

Project Leader, "THE STREAM" Magazine for the 30th Anniversary of the Community of Love

Dream School, Seosan | Aug 2021 - Dec 2021

- Led a team to publish "THE STREAM," a magazine commemorating the 30th anniversary, coordinating interviews with representatives from 11 organisations affiliated with Community of Love, and collaborated with Farmnd Coop
- Designed layout and directed content creation, ensuring high-quality publication delivered on time to community members.
- Interviewed with the director of Loving Care Clinic, synthesising insights into compelling narratives.

Participant, Panic Buying in COVID-19 Data Visualisation using Power BI

Dream School, Seosan | Jun 2020

- Developed Power BI dashboards to visualise the patent frequency of mask products in South Korea, analysing trends in panic buying during COVID-19.
- Integrated survey data to quantify correlations between epidemic-driven demand and business
- Designed a report poster using InDesign to communicate findings, enhancing stakeholder understanding of data-driven trends.

Awards & Scholarship

3rd Prize (Daewoong Pharmaceutical Co., Ltd., CEO's Award), JUMP AI 2024 - AI Drug Discovery Competition	2024
Big Data Seagull Scholarship (Category 'Gal'), Fall 2024	2024
Big Data Seagull Scholarship (Category 'Gal'), Spring 2024	2024