Nayoung Sophie Lee

69, Hangang-daero, Yongsan-gu,
Seoul, Republic of Korea
(+82) 10 6606-5125
nazero@korea.ac.kr
leenysky@gmail.com

Summary

I am currently in my first year of a master's degree in Mathematical Data Science (MDS) at Korea University. I built a mathematical foundation in mathematics during my undergraduate studies, and now focus on applying mathematics to artificial intelligence.

I view mathematics as fundamental for understanding and elaborating AI models. I am particularly interested in converting text into geometric images using domain-specific languages.

I am fortunate to be advised by Professor Donghun Lee and to be a part of the AIML@K Lab.

Education

2023.9- **Master of Science in Mathematics(Mathematical Data Science) | Korea University | G.P.A : 4.42/4.50**
Co-advisor: Dr.Lee Donghun
Courses: Applied Mathematics, Numerical Analysis, Special Studies in Applied Mathematics, Deep Learning and Mathematics, Real Analysis 1, Artificial Intelligence and Mathematics
Scholarship: Department of Mathematics Teaching Assistant Scholarship, Introductory Software Programming Teaching Assistant Scholarship, BK21 Scholarship

2019.3-2023.8 **Bachelor of Education in Mathematics | Ewha Womans University | G.P.A : 4.06/4.50**
Courses: Calculus 1,2, Linear Algebra, Analysis 1,2, Basic Statistics, Applied Statistics, Set Theory, Discrete Mathematics, Multivariable Calculus, Differential Geometry, Measure Theory, Abstract Algebra2, Education Courses, Mathematics Education Courses, Big Data Applications

2016.3-2019.2 **Science Track, Kyunggi Girls' High School**

Awards

2024 DAB (Data Analytics for Business) Contest | Golden Navi Team, 1st | Korea University
- Parsed risk area and optimized routes in Seoul's Songpa district navigation system
- Integrated TTS/STT voice functions

2023 Artificial Intelligence Grand Challenge | AIML@K Team, 7th | Ministry of Science and ICT
- Worked on topic modeling for the dataset generation team, utilizing LDA to generate topics from AI Hub's book data and document summary texts, and also engaged in clustering with MiniBatchKMeans and title generation using the KLUE-YNAT model

2023 Graduate Student Competition on Ethical Use of ChatGPT | Individual Team, 3rd | Korea University
- Explored effective ChatGPT prompting by using a multi-window setup with tasks segregated into modules for grammar correction, writing, outlining
- Wrote about strategies for writing efficient prompts

2023 Welcome to Teaching: First Time? Teaching Competition | Individual Team, 3rd | Korea University
- Created a video lecture on logarithms, incorporating current educational trends, such as climate change, into the mathematics lesson to engage students creatively with real-world issues

2023 Honors Award | Ewha Womans University

Research

2024.6- Individual Project | Robust GNN against Label Flipping Attack
- Applied p-Laplacian to nonlinearly reflect local characteristics
- Achieved ~5% improvement in node label prediction performance

2024.3-2024.5 Individual Project | Developing a Model to Convert Geometric Images into Text
- Constructed an Entity-Relationship Model for geometric problem texts
- Employed NLP models for text and image parsing

2024.3-2024.4 Paper | Clustering Strategies for Chatbot Data in Learning Management Systems: Focusing on Silhouette Scores
- Analyzed chatbot conversation logs, experimenting with various cluster numbers and hierarchical clustering levels to efficiently manage and analyze the complexity and vast quantity of data, evaluating the efficiency of clustering strategies based on silhouette scores

2024.3-2024.3 Workshop | 2024 AIML@K Spring Workshop: Unlocking Geometry
- Presented my journey that began with the question "How are new mathematical discoveries made?"
- Defined mathematical primitives using DSL (domain-specific language)
- Chose geometry as the domain to demonstrate this approach

2023.9-2024.2 Project | Virtual Engineering Platform Development Research: Property Regression and Prediction Based on Epoxy Chemical Composition
- Predicted properties based on epoxy chemical composition. Main roles included regression analysis, anomaly detection, and data preprocessing

Skills

Languages Korean (Native), English (Professional Fluency)
- TOEFL iBT: 91 (2024.9.1)
- OPIc: IH (2024.8.21)
- TOEIC: 840 (2024.8.25)
- Studied Abroad, North Vancouver, Canada (2008.6-2009.12)

IT Skills Python (Intermediate), MATLAB (Novice), R (Novice), Data Science, Mathematics

Certificate Teacher's Certificate in Mathematics

Employment History

2024.3-2024.6 Korea University | Teaching Assistant | SW Python Programming
2023.9-Present Korea University | Graduate Research Assistant | AIML@K Lab
2023.9-2023.12. Korea University | Teaching Assistant | Calculus
2023.3-2023.6 Quanda | Online Math Tutor | High School Math
2022.3-2022.4 Boseong Girls Middle School | Teaching Practice | Middle School Math
2019.8-2019.10 U2M Math Academy | Teaching Assistant | Middle School Math

Leadership & Volunteer Experience

2024.3-2024.3 Korea University | Python Bootcamp Instructor
- Taught how to use Git fundamentals for collaborative software development to graduates

2020.1-2020.1 Shinguang Elementary School | English Camp Teaching Assistant
- Taught and mentored students in English for a total of 60 hours

2019.7-2024.3 WantToSpeak (WTS) | Discussion Leader
- Participated in a language exchange group where members, including foreigners, watched TED videos and engaged in English discussions

Interests

- Geometry
- Deep Learning
- Bouldering