NGUYEN MINH DUC

ducnm@postech.ac.kr Duc M. Nguyen kurone02

Education

Pohang University of Science and Technology (POSTECH), South Korea **Feb 2025 – present**
Master of Science in ***Artificial Intelligence*** *GPA:* ***4.0/4.3***
Coursework: Machine Learning, Advanced Investment Science, Reinforcement Learning, etc.

Ulsan National Institute of Science and Technology (UNIST), South Korea **Sep 2020 – Aug 2024**
Bachelor of Science in ***Computer Science and Engineering****, Minor in* ***Industrial Engineering*** *GPA:* ***4.02/4.3***
Summa Cum Laude, Salutatorian. Recipient of UNIST Global Dream Scholarship that covers full tuition and living expenses.

Thesis: *Automated Math Reasoning: Solving Optimization Problems with Open Source Large Language Model (GitHub link)*

Coursework: Software Engineering, Operating System, Computer Network, Artificial Intelligence, Deep Learning, Natural Language Processing, Computer Vision, Financial Engineering, Algorithmic Trading, Time Series Analysis, etc..

Experience

Human-AI Interaction and Visualization Lab **Sep 2024 – Present**
Graduate Research Assistant, supervised by Professor Sungahn Ko *Pohang, Republic of Korea*
- Led and published a research paper on automatic handwritten math grading with Vision Language Models (VLMs).
- Built a novel Data Synthesis and Reinforcement Learning pipeline that improves VLMs' performance by 30%.

Human-AI Interaction and Visualization Lab **Jun 2022 – Aug 2024**
Undergraduate Research Intern, supervised by Professor Sungahn Ko *Ulsan, Republic of Korea*
- Led and published a research paper on automated mathematical reasoning with open-source Large Language Models.
- Analyzed state-of-the-art prompt engineering techniques for automated mathematical reasoning.
- Proposed and implemented a novel automated program repair algorithm that improves LLM's performance by 10%.
- Optimized the rendering time of the system's front-end by more than 50%, ensuring a smooth user experience.
- Designed and implemented the system's database for efficient data retrieval, capable of handling hundreds of requests.

Ulsan National Institute of Science and Technology **Mar 2022 – Feb 2025**
Teaching Assistant *Ulsan, Republic of Korea*
- Courses: *Introduction to AI Programming I, II*; *Discrete Mathematics*; *Calculus I*; and *Information Visualization*
- Responsible for answering questions and grading students' assignments/exams for more than 100 students per course.

Publications

1. Thu Phuong Nguyen*, **Duc M. Nguyen***, Hyotaek Jeon, Hyunwook Lee, Hyunmin Song, Sungahn Ko**, and Taehwan Kim**. "VEHME: A Vision Language Model For Evaluating Handwritten Mathematics Expressions". In *Proceedings of the Conference on Empirical Methods in Natural Language Processing (EMNLP), 2025* (to appear).
2. Joohee Kim, Hyunwook Lee, **Duc M. Nguyen**, Minjeong Shin, Bum Chul Kwon, Sungahn Ko, and Niklas Elmqvist. "DG Comics: Semi-Automatically Authoring Graph Comics for Dynamic Graphs". In *Proceedings of the IEEE Visualization Conference (IEEE VIS), 2024.*
3. **Duc M. Nguyen**, and Sungahn Ko. "Solving Optimization Problems with Open Source Large Language Model". In *AI4Math Workshop at the International Conference on Machine Learning (ICML), 2024.*

Open Source Contribution

AI4Finance-Foundation/FinRL **GitHub link**
Contributor *12k+ stars*
- Refactored the legacy code base to be compatible with the current dependencies' requirements.
- Fixed major bugs that prevented the deployment of the Deep Reinforcement Learning Agent to trading platforms, affecting thousands of end-users.

Projects

Portfolio Optimization | *Pytorch, FinRL, Algorithmic Trading* **GitHub link**
- Finalist at S&P Global-KAIST-UNIST-Kyung Hee University Quant Investment Model Competition.
- Lead researcher for developing Deep Reinforcement Learning models using PyTorch and FinRL.
- Proposed a novel Actor-Critic network based on multiple 1-dimensional Convolution Neural Networks.
- Deep Reinforcement Learning outperforms classical methods by more than 8-fold in terms of Sharpe Ratio.

Technical Skills

Languages: C/C++, Python, Typescript/Javascript, Bash Script, Kotlin, Dart, PHP, Scala, Matlab, Ruby, LaTeX
Database: MongoDB, SQLite
Front-end Frameworks: React, NextJs, Flutter
Back-end Frameworks: FastAPI, Flask, ExpressJs, Django, Springboot
Deep Learning Frameworks: Pytorch, Tensorflow, HuggingfaceTransformers, ms-swift