Jingeun Kim

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RESEARCH INTERESTS

My research primarily focuses on developing efficient machine learning frameworks. Specifically, I aim to explore efficient models using neural architecture search based on genetic algorithms. Furthermore, I am currently working on model compression, particularly pruning, using genetic algorithms for CNN-based models and pre-trained models.

Keywords: Neural Architecture Search, Genetic Algorithm, Model Compression

EDUCATION

Doctor of Philosophy:
Gachon University, Gyeonggi-do, South Korea (Mar. 2024 -)
Major in IT Convergence Engineering (Advisor: Yourim Yoon)
4.39/4.50 GPA

Master of Science:
Gachon University, Gyeonggi-do, South Korea (Sep. 2021 - Aug. 2023)
Major in IT Convergence Engineering (Advisor: Yourim Yoon)
4.06/4.50 GPA
Thesis title: Machine Learning with Various Feature Selection Methods for Diagnosis of Parkinson's Disease Using RNA-Seq

Bachelor of Science:
Gachon University, Gyeonggi-do, South Korea (Mar. 2016 - Aug. 2021)
Major in Computer Engineering (Advisor: Yourim Yoon)
3.73/4.50 GPA

WORK EXPERIENCES

Gachon University Sep 2023 – Feb 2024
Master's Degree Researcher
- Optimization of DenseNet architecture using a genetic algorithm with multi-dimensional encoding scheme

PROJECTS

Project 1 (May 2020 - May 2021)
Analysis of Pulmonary Diseases Induced by Fine Particulate Matter and Treatment Drug Screening Using Meta-Heuristic-Based Feature Selection Algorithm
Summary: This study compares how machine learning is efficient when classifying mRNAs or miRNAs.
Role: model implementation, evaluation, interpretation, and manuscript writing
Advisor: Yourim Yoon
Status: Paper accepted

Project 2 (Mar. 2021 - Nov. 2021)
Development of Next-Generation Battery Management System (BMS) with AI-Based Fire and Explosion Prevention for Lithium-ion Batteries
Summary: Estimate the resistance value of the battery cell after 10 days to prevent explosion and Battery anomaly detection using clustering.
Role: Researcher (model implementation, evaluation)
Advisor: Taegkeun Whangbo
Status: Paper accepted

Project 3 (May 2021 - May 2022)
Theory and Applications of Various Feature Selection Algorithms
Summary: This study uses EEG datasets and genetic algorithms to select meaningful features to increase the accuracy of machine learning.
Role: Overall study design, model implementation, evaluation, interpretation, and manuscript writing
Advisor: Yourim Yoon
Status: Manuscript submitted

Project 4 (May 2022 – Present)
Research on IT-BT/ET Convergence Technology Using Meta-Heuristic-Based Feature Selection Algorithms
Summary: Various feature selection methods improve the performance of machine learning when classifying Parkinson's disease
Role: Overall study design, model implementation, evaluation, interpretation, and manuscript writing
Advisor: Yourim Yoon
Status: Paper accepted

Project 5 (May 2023 – July 2025)
Healthway Development for Senior Citizens in the Age of Homo sapiens [Re:]Solution: Building a Healthway for Muscle Atrophy Prevention and Management
Summary: Enhancing classification accuracy through feature selection using correlation analysis
Role: Overall study design, model implementation, evaluation, interpretation, and manuscript writing
Advisor: Yourim Yoon
Status: Manuscript submitted

Project 6 (Jan 2024 - Present)
AI-based Maritime Search and Rescue Decision Making
Summary: This study utilizes AI to improve real-time data analysis, predictive modeling, and resource optimization, enhancing the efficiency and effectiveness of maritime SAR operations.
Role: Overall study design, model implementation, evaluation, interpretation, and manuscript writing
Advisor: Yourim Yoon
Status: Work in progress

Project 6 (Sep 2025 - Present)
Evolutionary Algorithm-Based Lightweight Techniques for Large Language Models
Summary: This project investigates evolutionary algorithm–driven structural optimization

methods for large language models (LLMs) to achieve parameter-efficient, lightweight architectures while preserving inference accuracy
Role: Principal investigator of the research project, Overall study design, LLM compression using evolutionary computation, experimental evaluation, performance analysis, and manuscript preparation.
Funding: 50 million KRW (≈ USD 38,500) over two years, awarded through the Ph.D. Student Scholarship Program.
Status: Work in progress

PUBLICATIONS

J6. Pruning for Efficient DenseNet via Surrogate-Model-Assisted Genetic Algorithm considering NAS Proxies
Jingeun Kim, Yourim Yoon
Swarm and Evolutionary Computation

J5. A Comparison of Binary and Integer Encodings in Genetic Algorithms for the Maximum k-Coverage Problem with Various Genetic Operators
Yoon Choi, **Jingeun Kim**, Yourim Yoon
Biomimetics

J4. Performance Analysis and Improvement of Machine Learning with Various Feature Selection Methods for EEG-Based Emotion Classification
Sherzod Abdumalikov, **Jingeun Kim**, Yourim Yoon
Applied Sciences

J3. Improving Modularity Score of Community Detection Using Memetic Algorithms
Dongwon lee, **Jingeun Kim**, Yourim Yoon
AIMS mathematics

J2. RNA Sequences-Based Diagnosis of Parkinson's Disease Using Various Feature Selection Methods and Machine Learning
Jingeun Kim, Hyejin Park, Yourim Yoon
Applied Sciences

J1. Comparative Study of Classification Algorithms for Various DNA Microarray Data
Jingeun Kim, Yourim Yoon, Hyejin Park, Yong-hyuk Kim
Genes

CONFERNCES

C4 Sparse Transformer for Long-term Forecasting via Genetic Algorithm
Jingeun Kim, Yourim Yoon
GECCO 2025

C3. Efficient Pruning of DenseNet via a Surrogate-Model-Assisted Genetic Algorithm
Jingeun Kim, Yourim Yoon
GECCO 2024

C2. Genetic Algorithm-based Pruning for Efficient DenseNet Architecture
Jingeun Kim, Yong-hyuk Kim, Yourim Yoon
ICAIIC 2024

C1. the battery risk prediction method using the deep learning
Kyunam Choi, Mona O, **Jingeun Kim**, Taegkeun Whangbo
ITC-CSCC 2021

WORKSHOPS

W1. From Forecast to Action: Uncertainty-Aware UAV Deployment for

Ocean Drifter Recovery
Jingeun Kim, Yong-Hyuk Kim, Yourim Yoon
CIKM Workshop on Spatio-Temporal Data Intelligence and Foundation Models 2025

DOMESTIC PUBLICATIONS

J2. Enhancing Machine Learning-based Drug-Drug Interaction Prediction using Feature Selection
Hojae Kim, **Jingeun Kim**, Yourim Yoon
Asia-pacific Journal of Convergent Research Interchange

J1. Battery thermal runaway cell detection using DBSCAN and statistical validation algorithms
Jingeun Kim, Yourim Yoon
The Journal of the Convergence on Culture Technology

MANUSCRIPTS UNDER REVIEW AND IN PREP

J1. A Study on the Effectiveness of Feature Selection considering mRMR across Different Datasets
Jingeun Kim, Yourim Yoon
Knowledge and Information Systems

TEACHING EXPERIENCE

2025 Fall	JAVA @Gachone University (T.A.)
2025 Spring	Algorithm @Gachone University (T.A.)
2024 Fall	Discrete mathematics @Gachone University (T.A.)
2024 Spring	Algorithm @Gachon University (T.A.)
2023 Fall	Discrete mathematics @Gachon University (T.A.)
	Advanced Programming @Gachon University (T.A.)
2023 Spring	Algorithm @Gachon University (T.A.)
2022 Fall	Discrete mathematics @Gachon University (T.A.)
2022 Spring	Algorithm @Gachon University (T.A.)

AWARDS, HONORS & SCHOLARSHIPS

2025-2027	Ph.D. Student Scholarship Program	38,500$
2025	SCI best paper award	350$
2024-	Tuition Exemption (100%), Educational Funding Scholarship	4500$
2021-2023	Tuition Exemption (100%), Educational Funding Scholarship @Gachon University	4500$
2022	SCI best paper award @Gachon University	100$
2020	Gachon University x-design contest 3rd place @Gachon University	200$
2016-2021	Tuition Exemption (30%), Educational Funding Scholarship @Gachon University	1000$

PROFESSIONAL SERVICE

Journal Reviewer	IEEE Transactions on Evolutionary Computation, BMC Psychiatry, Discover Oncology

SKILLS

Programming Languages	Python, JAVA
AI Frameworks	Pytorch, Tensorflow, sklearn, pandas, numpy
Languages	Korean (Native), English (Intermediate)

REFERENCES

Advisor	Prof. Yourim Yoon yryoon@gachon.ac.kr