

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 such as BERT.

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)

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 - Present)

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 writing

PUBLICATIONS

- 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 2023 [IF: 2.838]
- J1. Comparative Study of Classification Algorithms for Various DNA Microarray Data
Jingeun Kim, Yourim Yoon, Hyejin Park, Yong-hyuk Kim
Genes 2022 [IF:4.141]

CONFERNCES

- 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
 International conference on artificial intelligence in information and communication (ICAIIIC) 2024
- C1. the battery risk prediction method using the deep learning
 Kyunam Choi, Mona O, **Jingeun Kim**, Taegkeun Whangbo
 ITC-CSCC 2021

DOMESTIC PUBLICATIONS

- J1. Battery thermal runaway cell detection using DBSCAN and statistical validation algorithms
Jingeun Kim, Yourim Yoon
 The Journal of the Convergence on Culture Technology 2023 (In Korean; KCI)

MANUSCRIPTS UNDER REVIEW AND IN PREP

- J4. Improving Modularity Score of Community Detection Using Memetic Algorithms
 Dongwon lee, **Jingeun Kim**, Yourim Yoon
 AIMS mathematics (Major revision)
- J3. SMA-GA-NP: Pruning for Efficient DenseNet via Surrogate-Model-Assisted Genetic Algorithm considering NAS Proxies
Jingeun Kim, Yourim Yoon
 Work in progress
- J2. A Study on the Effectiveness of Feature Selection considering mRMR across Different Datasets
Jingeun Kim, Yourim Yoon
 Prepared for submit to IP&M
- J1. Emotion Classification using Feature Selection and Machine Learning Algorithms
 Sherzod Abdumalikov, **Jingeun Kim**, Yourim Yoon
 Electronics (under review)

TEACHING EXPERIENCE

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|--------------------|--|
| 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

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| 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 3 rd place @Gachon University | 200\$ |
| 2016-2021 | Tuition Exemption (30%), Educational Funding Scholarship | 1000\$ |

@Gachon University

PROFESSIONAL SERVICE

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| Journal Reviewer | BMC Psychiatry, Discover Oncology |
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SKILLS

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

REFERENCES

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