Jaejoon Choi

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RESEARCH INTERESTS

Data Mining, Defect & Anomaly Detection

EDUCATION

Kyung Hee University (KHU), College of Engineering *Yongin, Republic of Korea*

Advisor: Prof. Younghoon Kim *Mar.2025 - Present*

M.S., Department of Industrial and Management Systems Engineering, Intelligent Energy Convergence

Kumoh National Institute of Technology (KIT), College of Engineering *Gumi, Republic of Korea*

Advisor: Prof. Sanghyun Choo *Mar.2019 - Feb.2025*

B.S., Department of Industrial Engineering & Smart Factory Convergence

RESEARCH EXPREIENCES

AIMS(Artificial Intelligence & Management Scienece) Laboratory *Yongin, Republic of Korea*

Graduate Student *Mar.2025 - Present*

- Research on AI Agent for Algorithm Design and Optimization, Trustworthy and Applied AI.
- Assisted Projects and Reviewed Papers & Books.

HAIDS(Human-centered artificial intelligence and Data Science) Laboratory *Gumi, Republic of Korea*

Undergraduate Student *Mar.2024 - Feb.2025*

- Research on Emotion Analysis using Multimodal Learning, Recommender System and Defect Detection.
- Analyzed Datasets and Reviewed Papers.

Kumoh National Institute of Technology Industry-academic Cooperation Foundation *Gumi, Republic of Korea*

Undergraduate Student *Apr.2023 - Feb.2024*

- Research on Defect Classification, Thermal Management Systems and Materials for Lithium-ion Batteries.
- Assisted Prof. Youngsil Lee, Reviewed Papers and Assisted Projects.

PUBLICATION

JOURNAL ARTICLE

Designing a Data-Driven Energy Management Service: A Case Study of South Korea's National Industrial Complex

Salakhov T.[+], **Choi, J.**[+], & Kim, M.* (2025). *IEEE Access.*

[+] = Both authors contributed equally to this work. / * = Corresponding author

PRESENTATION

POSTER

Conditional U-Net Architecture with Feature-wise Linear Modulation for Wafer Defect Segmentation and Classification

Choi, J., Kim, Y.* (2025). 2025 Summer Conference of KDMS

Enhancing Recommender Systems through Sentiment-Aware Rating Recalibration

Jang, J., **Choi, J.**, and Choo, S.* (2025). 2025 Spring Conference of KIIS

Optimal Data Selection from Sentiment-Rating Analysis for Improving Recommendation Systems

Kim, S., **Choi, J.**, and Choo, S.* (2025). 2025 Spring Conference of KIIS

데이터 기반의 에너지 관리 서비스 아이디어 도출: 구미국가산업단지의 데이터를 활용한 사례연구

Salakhov T., Jeon, M., **Choi, J.**, and Kim, M.* (2024). 2024 Spring Joint Conference of KORMS and KIIE

PROJECT EXPERIENCES

A Language Model for Classifying Food Research Journals using Natural Language Processing and Retrieval-Augmented Generation *KFRI*

Team Member *Jun.2025 - Jul.2025*

- Developed a RAG-FSR (Retrieval-Augmented Generation for Food Science Research) Model for 2025 Korea Food Research Institute Food Data Analysis and Utilization Competition.
- As the volume of academic data in science and technology rapidly increases, researchers are facing difficulties in searching for prior studies and classifying content due to the limitations of existing keyword-based search systems.
- The results showed that RAG-FSR achieved an accuracy of 0.960, particularly in the multi-keyword classification task. Furthermore, on the exact-match accuracy metric for abstract generation, our model performed approximately 4-9 times better than the baseline models.
- This empirically demonstrates that the proposed model effectively mitigates the hallucination phenomenon common in large language models and can function as a highly accurate and reliable information classification and retrieval system for food science research data.

Development of binders and nonwoven additives for various applications such as mats, carpets, and wallpapers using nonwovens *Bokwang Industry Co*

Kumoh National Institute of Technology Industry-academic Cooperation Foundation's Project (Advisor: Youngsil Lee) *Sep.2024 - Oct.2024*

Developing stealth projectiles for interoperability with airborne manned and unmanned teaming systems *DAPA*

MET Lab's Project *May.2024 - Aug.2024*

Prediction of Mixed Defect Types in Semiconductors Using Vision Transformer and Similarity-Based Method *KIT*

Individual Project *Mar.2024 - May.2024*

- Individual Project conducted in a Capstone Design Lecture under the supervision of Prof. Young-Sil Lee at Kumoh National Institute of Technology.
- Two models based on Vision Transformers and KNN algorithms were designed, using Euclidean and Gaussian distance calculation methods for comparative analysis.

EG(Eco Gumi)-Service: Integrated Platform for Energy Efficiency and Sustainable Energy Use *KEPCO*

Team Member *Sep.2023 - Dec.2023*

- Developed a service idea for the 2023 Gumi Industrial Complex Energy Self-Sufficiency Datathon.
- Utilizing various algorithmic models such as Linear Regression, LSTM, and Ensemble Methods (Voting, Stacking, etc.) to derive R-squared and MAE.
- Proposing features for visualizing energy usage and policy notification services, and creating a Service Blueprint and user behavior simulation map to refine the service ideas.

A Policy Idea For University Development *KIT*

Team Member *Sep.2023 – Oct.2023*

- In-Campus Contest conducted in the Policy Idea Contest for University Development at Kumoh National Institute of Technology
- Proposed Establishment a "School of Liberal Studies" for undergraduate students to strengthen their convergence capabilities and expand opportunities for major exploration.
- Proposed the establishment of an interdisciplinary studies department, a course evaluation feedback system, and alumni visit programs to enhance competitiveness, innovative education, and university brand.

Proposed elder care centers in Seoul and identified optimal locations using AI. *Seoul City, Republic of Korea*

Team Member *Aug.2023 – Sep.2023*

- Proposal for 'Elderly Care Centers' (ECC) and Selection of Optimal Locations Based on Data for the 2023 Seoul Artificial Intelligence Idea Challenge
- By utilizing data on population and the number of welfare facilities in each region, we conducted clustering to select areas that need to be converted into ECC based on the proportional and inversely proportional relationships of the compared data.
- Clustering was performed using DBSCAN, and the hyperparameters were derived through GridSearch.

AWARDS & HONORS

AWARDS

2025	**Excellence Prize**, 2025 Korea Food Research Institute Food Data Analysis and Utilization Competition (Data Analysis Sector)	*KFRI*
2025	**Best Paper Award**, 2025 Summer Conference of KDMS	*KDMS*
2023	**Grand Prize**, Gumi Industrial Complex Energy Self-Sufficiency Datathon (Service Sector)	*KEPCO*
2023	**Excellence Prize**, A Policy Idea Contest For University Development, Kumoh National Institute of Technology	*KIT*

HONORS

2024	**Internal Scholarship (K-WEGO)**, High mileage earners for KIT Talent Certification among those who met the activity criteria.	*KIT*
2024	**Semester High Honors**, Awarded to students of the Smart Factory Convergence major with high achievements throughout the semester.	*KIT*
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2024	**Internal Scholarship (K-WEGO)**, High mileage earners for KIT Talent Certification among those who met the activity criteria.	*KIT*

2023 **Internal Scholarship (K-WEGO)**, High mileage earners for KIT Talent Certification among those who met the activity criteria. *KIT*
2023 **Internal Scholarship (K-WEGO)**, High mileage earners for KIT Talent Certification among those who met the activity criteria. *KIT*

Others

DESIGN PATENT

- Cho, S., CHUNG, M., JEON, M., **CHOE, J.** , JEONG, Y., CHOI, J., "쇼핑카트", Korean Intellectual Property Office, KR-Registration No. 3012568290000, April, 2024