

## EDUCATION

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### EWHA Womans University

Bachelor of Mathematics, double-majored in Computer Science.

Mar.2020-Feb.2025

- GPA 3.90/4.50 (Major GPA 3.79/4.50)

## RESEARCH INTERESTS

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- Multimodal Learning, Multimodal Hallucination, Anomaly Detection, Computer Vision, Natural Language Processing, Generative Model

## PUBLICATIONS

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### Abroad

- **E.-j. Park**, T. Kim, M. Kim, H. Lee, and G.-j. Lee, "SK-RD4AD : Skip-Connected Reverse Distillation for Robust One-Class Anomaly Detection," *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) Workshops*, 2025. (Under Review)

### Domestic

- **E.-j. Park\***, J.-w. Kim\*, H.-k. Lee\*, T.-k. Kim\*, and Y.-r. Cho, "Enhancing Knowledge-based Visual Question Answering Performance through Multilayer Co-Attention and Question-Aware Prompt," *Autumn Annual Conference of IEIE*, 2024.
- **E.-j. Park\***, Y.-s. Hwang\*, J.-s. Kim\*, and H.-j. Yang\*, "An Effective Model Architecture for Multimodal Few-shot Visual Grounding without Fine-Tuning," *Autumn Annual Conference of IEIE*, 2024.
- T.-k. Kim, **E.-j. Park**, J.-w. Park, and A.-r. Han, "A.I. Voice Phishing Detection Solution Using NLP Algorithms," *Korean Information Processing Society Conference Proceedings(KIPS)*, vol. 30, no. 2, pp. 1045-1046, Nov. 2023.
- H.-j. Kim, B.-y. Park, **E.-j. Park**, and J.-h. Jeong, "Development of a Braille Translation and Document Summarization System for the Visually Impaired Education," *Korean Information Processing Society Conference Proceedings(KIPS)*, vol. 30, no. 2, pp. 969-970, Nov. 2023.

\* Equal contributions

## RESEARCH EXPERIENCE

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### Electronics and Telecommunications Research Institute (ETRI)

Language Intelligence Lab, Student Intern

Daejeon, Korea

Jul.2024-Aug.2024

- Participated in a government project on "AI technology development for expert decision support, focusing on enhancing the explainability of AI-generated decisions".
- Utilized ChatGPT for data construction and validation, and applied prompt tuning to improve the model's performance and accuracy in generating reliable expert-level explanations.

## AWARDS AND HONORS

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- Information and Communication Technology Evaluation Director's Award (Silver)  
– for "AI Braille English-Korean Translator", 2023 Hanium ICT Mentoring.
- Grand Prize , Korean Information Processing Society Conference (ACK 2023)  
– for "Development of a Braille Translation and Document Summarization System for the Visually Impaired Education" , 2023 Hanium ICT Mentoring.

## **EXTRACURRICULAR ACTIVITIES**

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### **deep daiv.**

*Apr. 2022- Jan. 2025*

#### *Member*

- 2023-2024 Multi-Modality Team *Nov. 2023- Jan. 2025*
- 2023 Winter Season. Data Journalism Team *Jan. 2023-Apr. 2023*
- 2022 Summer & Winter Season. Data Analysis Team *Apr. 2022-Nov. 2022*

### **EWHA AI/DS Academic Club**

*Sep.2023-Feb.2024*

#### *Intermediate-Level Team Member*

- Conducted in-depth study sessions on machine learning and deep learning theories, focusing on intermediate-level concepts.
- Completed a toy project on government web services using Retrieval-Augmented Generation (RAG) to improve information access.

## **KEY PROJECTS**

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### **Skip-Connected Reverse Distillation for Robust One-Class Anomaly Detection** *Apr. 2024– Oct. 2024*

#### *Hanium ICT Mentoring*

- Developed SK-RD4AD by introducing non-corresponding skip connections to enhance multi-scale feature retention, enabling precise detection of fine-grained anomalies. This improvement allowed the model to capture both detailed and high-level features, essential for reliable anomaly detection in complex industrial environments.
- Achieved a 2.5% AUROC improvement on the Valeo Anomaly Detection dataset and an AUPRO increase of over 21% on the VisA dataset, surpassing benchmarks. Optimized feature extraction and localization, demonstrating SK-RD4AD's adaptability and robustness in real-world applications.

### **Robust Audio-Visual Classification under Uncertain Missing Modality**

*Nov. 2024– Jan. 2025*

#### *deep daiv.*

- Proposed a robust end-to-end framework to handle Uncertain Missing Modality scenarios in Audio-Visual Classification, integrating Prompt Learning to adaptively manage noisy and missing data conditions. The framework employs a unified Prompt Token Integration at both Input and Attention levels to enhance cross-modal information exchange.
- Achieved a 0.10 improvement in classification accuracy under Vision-Only (Only Noisy Audio) scenarios and 0.09 under both noisy modalities, demonstrating the model's ability to maintain robust performance across all Missing Modality combinations. Additionally, reduced memory usage by 82.3% and shortened training time by 96% compared to traditional Fine-Tuning approaches.

### **Multimodal Few-Shot Visual Grounding without Fine-Tuning**

*Jul. 2024– Oct. 2024*

#### *deep daiv.*

- Developed a few-shot visual grounding model using Dynamic MDETR, enhanced with multimodal prompts and cross-attention mechanisms for effective alignment of image and text features. Incorporated both same-class and different-class templates, enabling nuanced category distinction with minimal data environments.
- Achieved 83.6% accuracy on the RefCOCOg dataset, showcasing strong generalization for unseen categories. Integrated contrastive learning and pseudo-class embeddings, allowing the model to adapt efficiently to new classes without requiring fine-tuning.

### **Enhanced Q-Former for Visual Question Answering (VQA)**

*May. 2024 – Aug. 2024*

#### *deep daiv.*

- Enhanced the Q-Former architecture with a Modular Co-Attention Network (MCAN) to improve cross-modal interactions, facilitating more accurate reasoning in complex VQA tasks. The multi-layered attention

mechanism helped refine image and question features through progressive Self-Attention and Cross-Attention.

- Achieved a 6.1% accuracy boost on OK-VQA and AOK-VQA by implementing Question-Aware Prompts, which provided structured context to guide the model's interpretation, resulting in more contextually relevant answers.

### **AI Voice Phishing Detection Solution Using NLP Algorithms**

*Apr. 2023 – Oct. 2023*

*Hanium ICT Mentoring*

- Developed a customized solution for voice phishing detection using KoBIGBIRD, R-BERT, and Kr-BERT to process long conversational data, focusing on extracting patterns linked to phishing behavior. This model was tailored to capture linguistic nuances in Korean, enhancing the detection of fraudulent intent.
- Combined CLS tokens from KoBIGBIRD and Kr-BERT to merge full conversation context with key keyword extraction, resulting in high precision for distinguishing phishing attempts. Adjusted KoBIGBIRD's architecture for long sequences, improving detection accuracy in extended conversations.

## **SKILLS**

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### **Engineering**

- **Programming Languages** - Python(PyTorch, Tensorflow), JavaScript, MySQL, HTML/CSS
- **Development Tools** - Git, VS Code, Jupyter Notebook, Visual Studio, PyCharm, Eclipse

### **General**

- **Language Skills** - Native Korean, Conversational proficiency in English