HOIN JUNG

Purdue University, West Lafayette, IN, USA
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EDUCATION

Purdue University — **West Lafayette, IN, USA**
Ph.D. in Electrical & Computer Engineering — Jan. 2023 – Present
(Anticipated Graduation: May 2027)

Seoul National University — **Seoul, Korea**
M.S. in Computational Science & Technology — Sept. 2020 – Aug. 2022
· Thesis: "Local-Ensemble Graph Collaborative Filtering with Spectral Co-Clustering"

Korea Aerospace University — **Goyang, Korea**
B.E. in Aerospace & Mechanical Engineering — Mar. 2010 – Feb. 2014
· Major of Aircraft System Engineering
· *Vice President*, Students Government (2013)

RESEARCH INTERESTS

Machine Learning Under Limited Data
· Developing Self-Supervised Learning Techniques
· Exploring Positive-Unlabeled Learning and Novel Category Discovery

Trustworthy AI
· Achieving Fairness in Machine Learning
· Detecting and Mitigating Bias in Multimodal, Foundational, and Generative Models

PUBLICATIONS

H.Jung and X.Wang, "Towards On-the-Fly Novel Category Discovery in Dynamic Long-Tailed Distributions," In *IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*, 2025.

H.Jung and X.Wang, "Fairness-Aware Online Positive-Unlabeled Learning," In *Conference on Empirical Methods in Natural Language Processing (EMLNLP Industry Track)*, 2024.

H.Jung, T.Jang and X.Wang, "A Unified Debiasing for Vision-Language Model across Modalities and Tasks," In *the Thirty-eighth Annual Conference on Neural Information Processing Systems (NeurIPS)* **(Spotlight)**, 2024.

H.Jung, V.C.D.Nascimento, H.Liu, X.Wang, C.K.Koh, and D.Jiao, "Explainable Planar Multiband Antenna Designer with Wasserstein Generative Adversarial Network," In *IEEE International Symposium on Antennas and Propagation (AP-S/URSI)*, 2024.

H.Jung, H.S.Choi and M.Kang, "Boundary Enhancement Semantic Segmentation for Building Extraction From Remote Sensed Image," In *IEEE Transactions on Geoscience and Remote Sensing*, 2021.

ONGOING RESEARCH: SELECTED PAPERS UNDER REVIEW

H.Jung, S.Lu, D.Wang, and X.Wang, "Reliable Image Quality Evaluation and Mitigation of Quality Bias in Generative Models," In *Conference on Computer Vision and Pattern Recognition (CVPR)*, 2025.

S.Lu, **H.Jung**, Z.Fang, and X.Wang, "Inside Out: Harnessing Biased Models for Fair Diffusion Sampling without Demographics," In *Conference on Computer Vision and Pattern Recognition (CVPR)*, 2025.

H.Jung, J.Chai and X.Wang, "Adversarial Latent Feature Augmentation for Fairness," In *The Thirteenth International Conference on Learning Representations (ICLR)*, 2025. **(Average Rating: 6.50)**

H.Jung, V.C.D.Nascimento, H.Liu, X.Wang, C.K.Koh, and D.Jiao, "Explainable and Automated Antenna Designer with Generative AI," In *IEEE Transactions on Antennas and Propagation*, 2025.

AWARDS

NeurIPS 2024 Scholar Award - Full Financial Aid — Oct 2024

WORK EXPERIENCE

Heterogeneous Integration Design Institute — **West Lafayette, IN, USA**
Research Assistant, Elmore ECE Emerging Frontiers Center — Jan. 2023 – Present
· Designed an automatic generative designer for multi-band planar antenna.
· Engineered an explainable model for the ML-based EM simulation via SHAP values.

Samsung Electronics — **Suwon, Korea**
Engineer, R&D Team, Department of Digital Appliance — Aug. 2017 – Aug. 2020
· Developed the thermo-fluid performance of freezing system for brand-new refrigerator.
· Analyzed and optimized refrigeration cycle control system to reduce the power usage.

ROK Air Force — **Chungju, Korea**
Lieutenant, Aircraft Maintenance Officer, The 19th Fighter Wings — Jun. 2014 – May. 2017
· Managed aircraft line maintenance and administered ground safety department for the division.

PRESENTATIONS

"An Efficient and Unified Debiasing Approach for Vision-Language Models across Modalities and Tasks" — Jul. 2024
Lightning Talk, Fast Machine Learning for Science Conference 2024

"Explainable Planar Multiband Antenna Designer with Wasserstein Generative Adversarial Network" — Jul. 2024
Oral, 2024 IEEE International Symposium on Antennas and Propagation and ITNC-USNC-URSI Radio Science Meeting

"Boundary Improvement Module for Binary Semantic Segmentation in Remote Sensing" — Jun. 2021
Oral, 2021 Spring, KSIAM (Korean Society for Industrial and Applied Mathematics)

"Segmentation model for tracking building in satellite imagery" — Nov. 2020
Poster, 2020 Fall, KSIAM (Korean Society for Industrial and Applied Mathematics)

ACADEMIC SERVICE

Program Committee
· 2025 AAAI Conference on Artificial Intelligence

Reviewer
· The IEEE/CVF Conference on Computer Vision and Pattern Recognition 2025
· European Conference on Computer Vision 2024
· 2024 ACM SIGKDD International Conference on Knowledge Discovery and Data Mining - Research Track
· IEEE Transactions on Geoscience and Remote Sensing
· 2024 AAAI Conference on Artificial Intelligence

PROJECTS EXPERIENCE

Deep Learning based Video Content Analysis and Narrative Analysis — Jun. 2022 – Dec. 2022
National Research Foundation of Korea
· Implemented YouTube data crawler and text classification for comprehensive narrative analysis.

Superpixel-based Graph Convolutional Network for Semantic Segmentation — Fall 2021
Course: Machine Learning for Visual Understanding, Seoul National University, Korea
· Designed superpixel-based graph convolution network semantic segmentation framework.
· Utilized SuperpixelGCN for remote sensed images.

Risk Detector via Object Detection — Jun. 2021 – Dec. 2021
KCC Co.

· Designed multi object detection and risk degree estimation model for construction site safety.
· Modified open source framework using Open-MMLab library.

Place Classifier for Emergency Management System Jan. 2021 – Dec. 2021
Yonsei Severance Hospital
· Designed Res2Net-based classifier framework using Pytorch.
· Collected datasets for place classifier for emergency management system.

SCHOLARSHIPS

Future Industry Talent Graduate Scholarship,
Hyundai Motor Chung Mong-Koo Foundation Fall 2021 – Spring 2022

National S&T (Science & Technology) Scholarship,
Korea Student Aid Foundation Fall 2010

TEACHING EXPERIENCE

ECE 570 Artificial Intelligence | Teaching Assistant Fall 2024
Electrical & Computer Engineering, Purdue University

Computer Literacy & Programming (Python) | Instructor Mar. 2021 – Jul. 2022
Language Education Institute, Seoul National University

L0444: Basic Computing (Python) | Teaching Assistant Spring 2022
Faculty of Liberal Education, Seoul National University

L0444: Basic Computing (Python) | Teaching Assistant Spring 2021
Faculty of Liberal Education, Seoul National University