Jihyo Kim

KAIST, Daehak-ro 291, Yuseong-gu, Daejeon, 34141, Rep. of Korea
(+82) 10-5039-8440 | jihyo.kim023@gmail.com | jihyo-kim-0b5289194 | Google Scholar

Education

SeoulTech (Seoul National University of Science and Technology) Seoul, Rep. of Korea
PhD in Department of Data Science Sep. 2020 - Aug. 2025

- Advisor: Sangheum Hwang
- Scholarship: Received scholarship for academic excellence for one semester
- Dissertation: "Towards Trustworthy Deep Learning: Evaluation, Interpretation and Application for Robust Real-World Systems" (Best paper award (on-compus))

University of Sydney Sydney, Australia
Visiting student in Trustworthy Machine Learning Lab at Sydney AI Centre Apr. 2024 - Mar. 2025

- Supervisor: Tongliang Liu
- Talk: Trustworthy Deep Learning in the Wild (Jul. 2024)

SeoulTech (Seoul National University of Science and Technology) Seoul, Rep. of Korea
MSc in Department of Data Science Sep. 2018 - Aug. 2020

- Supervisor: Sangheum Hwang
- Scholarship: Received scholarship for academic excellence for 3 semesters
- Thesis: "A Study on Active Learning based on Deep Neural Networks with Practical Considerations"

Northumbria University Newcastle upon Tyne, U.K.
BSc (Hons) in Information Technology Management for Business Mar. 2015 - Feb. 2018

- Dual Degree with BSc in ITM, SeoulTech
- Completed one academic year of on-campus study

SeoulTech (Seoul National University of Science and Technology) Seoul, Rep. of Korea
BSc in Information Technology Management (ITM) Mar. 2014 - Feb. 2018

- Award: 1st Place, Global Challenger, 2015

Research Experience

Developing a Facial Skin Condition Evaluation Model Using a Large Vision-Language Model ArtLab
Jan. 2023 - Jun. 2023

- Reviewed existing large-scale vision-language models and their applications in domains requiring specialized knowledge, such as the medical field.
- Constructed description and instruction datasets of facial skin images based on existing facial skin condition grade datasets, using a vision-language model.
- Finetuned a large vision-language model on the constructed facial skin dataset to specialise it for facial skin conditions.
- Compared the effectiveness of several finetuning strategies in learning from the constructed facial skin dataset.
- Proposed suitable fine-tuning strategies for each required capability of large vision-language models.

Learning Representations via Self-supervised Learning for Skin Conditions Classification ArtLab
Jun. 2022 - Dec. 2022

- Reviewed and reproduced existing self-supervised learning methods.
- Developed a self-supervised representation learning method for extracting robust and fine-level features from facial skin images, which interchanges two different contrastive learning strategies in terms of definition of negative samples.
- Demonstrated the effectiveness of the proposed self-supervised learning method on a practical dataset that collected from diverse real world environments varying on light conditions and image resolutions.
- Compared the proposed self-supervised learning method to supervised models pretrained with ImageNet or Skin data, and a self-supervised model pretrained with our facial skin dataset.
- Observed that the proposed method shows better performance than the comparison methods, and is robust to the amount of labeled training data and various image conditions.

Development of the Optical Character Recognition Model for Structured Documents G&Net
Feb. 2021 - Jul. 2022

- Reviewed and reproduced existing OCR methods for documents in Korean.
- Developed a pipeline to generate application-specific synthetic data through analysis of failure cases and target domain dataset properties.
- Achieved the best performance on Korean prescription dataset amongst the existing OCR methods and public OCR API including Naver OCR API and Google Vision API.
- Compared the performance gained from model improvement and that from training dataset improvement.
- Observed that the data-centric approach via the proposed synthetic data generation pipeline is more effective than model improvement.

Development of Outlier Detection Methods Considering Latent Subclassification LG CNS
Mar. 2020 - Dec. 2020

- Reviewed and reproduced popular existing methods in out-of-distribution detection (OoDD) task.
- Compared the performance of existing methods on datasets where fine-level features determine predictions.
- Empirically verified that the existing OoDD methods perform poorly on such datasets.
- Pointed out that misclassification detection (MD), open-set recognition (OsR) and OoDD are on the same line of study where the key is producing well-ranked confidence values according to how confident models are about their predictions.
- Proposed a unified benchmark for measuring the integrated performance of three unknown detection tasks including MD, OsR, and OoDD.
- Observed that most of the existing methods in the three unknown detection tasks do not perform properly for the unified benchmarks.

Development of Active Learning Method based on Model Calibration LG CNS
Mar. 2019 - Dec. 2019

- Reviewed popular existing methods in model calibration and tasks including image classification, OoDD and active learning.
- Empirically verified that the true class probability of a sample can be estimated by how many times the sample is classified correctly during training.
- Proposed the novel regularisation method, Correctness Ranking Loss (CRL), which encourages a classifier to learn the ordinal ranking between predictive probabilities and how many times the sample is classified correctly.
- Validated the proposed regularisation method on image classification, OoDD and active learning with various models and datasets.
- Observed the competitive performance of CRL compared to existing calibration, OoDD and active learning methods.

Publications

Towards a Practical Solution for Source-Free Domain Adaptation: A Few-Shot Fine-Tuning Approach
Suho Lee, Seungwon Seo, Jihyo Kim, Yejin Lee and Sangheum Hwang
Under Review

Exploring the Effectiveness of Data-centric AI Approaches in Developing a Prescription Recognition System
Jihyo Kim, Jaemoon Hwang, Daejeong Moon and Sangheum Hwang 2025
International Journal on Document Analysis and Recognition (IJDAR)

Metadata Enriched Multi-Instance Contrastive Learning for High-Quality Facial Skin Visual Representations
Jihyo Kim, Sungchul Kim, Seungwon Seo, Bumsoo Kim, Daejeong Mun, Hoonjae Lee and Sangheum Hwang 2025
Applied Artificial Intelligence (AAI)

Reflexive Guidance: Improving OoDD in Vision-Language Models via Self-Guided Image-Adaptive Concept Generation
Jihyo Kim*, Seulbi Lee* and Sangheum Hwang (* equal contribution) 2025
International Conference on Learning Representations (ICLR)

Comparison of Out-Of-Distribution Detection Performance of CLIP-Based Fine-Tuning Methods
Jeonghyeon Kim, Jihyo Kim and Sangheum Hwang 2024
International Conference on Electronics, Information, and Communication (ICEIC)

A Unified Benchmark for the Unknown Detection Capability of Deep Neural Networks
Jihyo Kim, Jiin Koo and Sangheum Hwang 2023
Expert Systems with Applications (ESWA)

Deep Active Learning with Contrastive Learning Under Realistic Data Pool Assumptions
Jihyo Kim, Jeonghyeon Kim and Sangheum Hwang 2022
Association for the Advancement of Artificial Intelligence Workshop on Practical Deep Learning in the Wild

Confidence-aware Learning for Deep Neural Networks
Jooyoung Moon*, Jihyo Kim*, Younghak Shin and Sangheum Hwang (* equal contribution) 2020
International Conference on Machine Learning (ICML)

Presentations

Development of a Customized Large Vision Language Model for Facial Skin Condition Assessment
Bumsoo Kim, Jihyo Kim, Minjun Kang, Hwiyeong Lee and Sangheum Hwang 2024
Oral, Korea Computer Congress (KCC)

A Labeling Method for Classification Problems with Unclear Criteria: Ranking Based on Pairwise Comparisons
Bumsoo Kim, Jihyo Kim and Sangheum Hwang 2023
Poster, Korea Computer Congress (KCC)

Enhancing Out-of-Distribution Detection Performance of CLIP Based on Fine-tuning with Random Texts
Jeonghyeon Kim, Jihyo Kim and Sangheum Hwang 2023
Oral, Korea Computer Congress (KCC)

A Study on Skin Diagnosis using Self-supervised Learning and Meta-data
Sungchul Kim, Daejeong Mun, Bumsoo Kim, Seungwon Seo, Jihyo Kim and Sangheum Hwang 2022
Oral, Conference of the Korean Institute of Industrial Engineers (KIIE)

A Comparative Study of Deep Active Learning Algorithms under Real-World Conditions
Jihyo Kim and Sangheum Hwang 2022
Poster, Korea Computer Congress (KCC)

A Comparative Study on Public OCR API Performance on Documents in Korean
Jihyo Kim, Jaemoon Hwang, Daejeong Mun and Sangheum Hwang 2021
Poster, Conference of the Korean Institute of Industrial Engineers (KIIE)

A Regularisation Method to Prevent Overconfidence in Deep Neural Networks
Jooyoung Moon, Jihyo Kim and Sangheum Hwang 2019
Oral, Conference of the Korean Institute of Industrial Engineers (KIIE)

Work Experience

Korea Advanced Institute of Science & Technology (KAIST) Rep. of Korea
Postdoctoral Researcher Oct. 2025 - Present

- Principal Investigator: KyungTae Lim

LG CNS Rep. of Korea
Intern Jul. 2023 - Aug. 2023

- Examined how deep learning techniques are being applied in industrial settings.
- Reviewed existing methods for fine-tuning diffusion models.
- Proposed a method for fine-tuning diffusion models using only a text encoder to improve the ability to generate detailed image features.
- Observed improvement of the generated image detail with the proposed method.

Skills

- **Programming & DevOps**
  Docker, Linux, Python, R, PyTorch, Keras, LaTex
- **Language**
  Fluent in Korean
  Conversational level English

Research Area

- Machine learning & deep learning algorithm and application
- Model uncertainty, out-of-distribution detection, active learning, self-supervised learning, vision-language model