

Sungwon Woo

AI RESEARCH SCIENTIST

✉ +82 10-5590-3926 | 📩 scottwoo1122@gmail.com | 🏷 sungwon-woo.github.io | 📱 sungwon-woo-3aab4827b/ | [in](#)

PROFILE

I am an alum of Sogang University, where I earned a Master's degree in Artificial Intelligence with a specialization in Computer Vision in 2025, advised by Prof. Jongho Nang. I also received my B.S. in Computer Science and Engineering in 2023. My research lies at the intersection of **computer vision** and **deep learning**, with a special interest in building intelligent visual systems that are beyond supervised learning and data-memory efficient. My primary research interests include **continual learning**, **few-shot learning**, **self(semi)-supervised learning**, while I also have experience in image retrieval and lightweight model design.

EDUCATION

Sogang University

Seoul, Korea

M.S. IN DEPARTMENT OF ARTIFICIAL INTELLIGENCE

Mar 2023 - Aug 2025

- Advisor: Prof. Jongho Nang
- Thesis: *"Neural Collapse-Driven, Uncertainty-Aware Framework for Few-shot Class-Incremental Learning"* [\[link\]](#)

Sogang University

Seoul, Korea

B.S. IN COMPUTER SCIENCE AND ENGINEERING

Mar 2017 - Feb 2023

- Graduated with major coursework in Algorithms, Operating Systems, and AI

PUBLICATIONS

CONFERENCE

* Co-first Authors. † Corresponding Author.

Does Prior Data Matter? Exploring Joint Training in the Context of Few-Shot Class-Incremental Learning

[\[link\]](#)

Shiwon Kim*, Dongjun Hwang*†, **Sungwon Woo***, Rita Singh†

ICCV Workshop on Continual Learning in Computer Vision (CLVision), 2025.

Relational Self-supervised Distillation with Compact Descriptors for Image Copy Detection

[\[link\]](#)

Juntae Kim*, **Sungwon Woo***, Jongho Nang†

IEEE/CVF Winter Conference on Applications of Computer Vision (WACV), 2025.

Semi-supervised learning Knowledge Distillation with feature Augmentation (KDA)

[\[link\]](#)

Sungwon Woo, Jeongae Lee, Jung Lee, Hojune Kim, Jinhyeong Bae, Young Choi, Jongho Nang†

Korean Institute of Information Scientists and Engineers (KCC), 2024.

Autoencoder-based CNN LSTM drowsy driving detection model and safe driving system using YOLOv7(5) road front object recognition

[\[link\]](#)

Sungwon Woo, Moonhae Kang, Junseok Lee

Korean Institute of Information Scientists and Engineers (KCC), 2022.

Research Projects & Experience

Multimedia System Lab, Sogang University

GRADUATE RESEARCHER, UNDERGRADUATE INTERN

Seoul, S. Korea

Sep 2022 - Aug 2025

- **Development of Efficient Networks for Image Copy Detection**

Developed a lightweight network using knowledge distillation to address high computational overhead in image retrieval and copy detection.

Developed a compact image descriptor that improves database search efficiency and achieves competitive results across diverse benchmarks.

- **Capstone Design 2 Project**

[\[video\]](#)

Developed safety features by leveraging road sign object detection to model the surrounding driving environment, and implemented driver drowsiness detection using a CNN-LSTM.

Carnegie Mellon University

Pittsburgh, USA

Aug 2024 - Feb 2025

VISITING SCHOLAR

- **A New Benchmark for Few-Shot Class-Incremental Learning: Redefining the Upper Bound**

[\[report\]](#) [\[video\]](#)

Introduced a new joint training benchmark tailored for few-shot class-incremental learning by integrating imbalanced learning, and contributed to standardizing inconsistencies in current experimental setups within a unified framework.
(advised by [Prof. Rita Singh](#))

- **Artificial Intelligence on the Edge with Robotics (AIER)**

[\[slide\]](#) [\[video\]](#)

Developed an AI Cannon system on Jetson Orin Nano that detects stationary and moving zombies using an object detection model, determines shooting order through LLM-based speech input, and manages uncertainty by requesting user confirmation for ambiguous targets.

(advised by [Stephen Beck](#))

- **Invisible Watermarks: Attacks and Robustness**

[\[report\]](#) [\[video\]](#)

Improved watermark robustness via cascaded image and latent space techniques, and enhanced attacks with a custom remover network.

Smilegate

Pangyo, S. Korea

STUDENT RESEARCHER

Jun 2024 - Jul 2024

[\[video\]](#)

- **Generating Yua Han's SNS Images and Reels**

Created virtual human Yua Han's Instagram images and reels video with Dreambooth and Face Reenactment

Awards, Fellowships, & Grants

2025 **Awarded 2nd place (2/34) in the Academic Excellence Award**, CMU

45,000 USD

2024 **Carnege Mellon University AI Intensive Training Program Fellowship**, IITP

7,100 USD per
semester

2023-2025 **Smilegate AI Major (DHE) Scholarship**, Smilegate

2023 **5th place on Video Similarity Challenge**, CVPRW2023, VCDW by META

2022 **4th place on Food Classification Challenge**, KT GenieLabs

Teaching Experience

Fall 23' **Discrete Structure(AIE2070-01)**, Teaching Assistant

Sogang
University

Spring 23' **Computer Programming I(AIE2050-02)**, Teaching Assistant

Sogang
University