

SUYOUNG CHO

EDUCATION

Pusan National University
Bachelor of Engineering in Computer Engineering

Busan, South Korea
Mar. 2022 – Aug. 2026

RESEARCH EXPERIENCE

Undergraduate Research Assistant
Visual Intelligence and Perception Lab, Pusan National University
Advisor: Prof. Jinsun Park

Aug. 2025 – Present
Busan, South Korea

Generative Augmentation for Occlusion-Robust Thermal Object Detection

- Developed the diffusion-based component of a hybrid augmentation pipeline using FLUX.1-Fill, fractal-tree masks, and a thermal-domain prompt to synthesize irregular, vegetation-like occlusions in thermal images.
- Evaluated the pipeline across six train-test configurations involving original, inpainted, and diffusion-occluded images to characterize robustness across occlusion distributions.
- Trained YOLO11m on the full hybrid dataset, improving recall by 4.9 percentage points (0.820 to 0.869) on the original test set and by 12.3 points (0.674 to 0.797) on the FLUX-occluded test set.
- Analyzed a trade-off in which higher recall coincided with lower mAP50-95 under some conditions, consistent with conflicting bounding-box cues between reconstructed and visibly occluded objects.

PUBLICATIONS

Gong, M.*, **Cho, S.***, and Park, J. “Data Augmentation for Improving Thermal Object Detection under Partial Occlusion.” *38th Workshop on Image Processing and Image Understanding (IPIU 2026)*, Feb. 2026. Poster presentation. *Equal contribution. [Title translated; paper in Korean.]

SELECTED PROJECTS

Broom: On-Device AI Photo Management | PNU Capstone Bronze Award Mar. 2025 – Sep. 2025

- Led the computer vision and machine learning development of an on-device photo management application, including data preparation, model training, threshold calibration, similarity clustering, and custom-album inference.
- Curated and labeled a custom five-class image dataset and mitigated class imbalance using weighted loss and class-specific confidence thresholds.
- Consolidated five category-specific classifiers into a single five-class MobileNetV2 model and applied INT8 TensorFlow Lite quantization, reducing model size by approximately 75% for on-device deployment.
- Implemented embedding-based custom-class registration and duplicate-image grouping using L2-normalized features, centroid representations, cosine similarity, pairwise comparison, and disjoint-set union.
- The resulting software was registered with the Korea Copyright Commission.

Arctic Sea-Ice Forecasting | K-Ocean AI Challenge 2025 Proposal Oct. 2025

- Co-developed and submitted a technical concept proposal for sea-ice forecasting and Arctic route planning using attention-based fusion of satellite imagery with oceanographic and meteorological variables.

Deepfake Detection AI Challenge 2025 | Synthetic-Data Development Oct. 2025 – Nov. 2025

- Led the design and curation of a synthetic-image training dataset spanning demographic groups, age ranges, activities, occupations, lighting conditions, camera viewpoints, and aspect ratios.
- Built structured prompt libraries for multiple image-generation platforms and organized candidate real and synthetic data sources to broaden training-domain coverage.

TECHNICAL SKILLS

Languages: Python, C/C++, Java, JavaScript, TypeScript, SQL

Machine Learning / Computer Vision: PyTorch, TensorFlow, TensorFlow Lite, OpenCV, NumPy, Pandas

Web / Database: Next.js, Node.js, Express.js, MySQL

Tools: Linux, Git, Weights & Biases, TensorBoard, Android Studio

LEADERSHIP & SERVICE

Volunteer Korean Language Tutor

Mar. 2022 – Aug. 2022

Pusan National University

Busan, South Korea

- Tutored international students in Korean language and culture and developed customized learning materials to explain complex grammatical structures.