

Byeonghyun Pak

Location: Daejeon, South Korea | **Email:** byeonghyun.pak@gmail.com | **Website:** byeonghyunpak.github.io

Google Scholar: scholar.google.com/byeonghyunpak | **Github:** github.com/ByeongHyunPak

Research Interest

My research interest lies at the intersection of computer vision and robot learning. Particularly, I focus on developing a unified representation that jointly models dynamic 3D geometry and open-world semantics. I believe this is fundamental for generalization to unseen environments and successful execution of complex, long-horizon tasks.

Education

Daeju Gyeongbuk Institute of Science and Technology (DGIST)

Mar 2019 – Feb 2023

B.S. in Engineering (Interdisciplinary Program)

Daeju, South Korea

- Concentration in Computer Science & Engineering

University of California, Berkeley (UCB)

Jul 2019 – Aug 2019

Visiting Student (Freshman Global Leadership Program)

Berkeley, CA, USA

Publications

*: Equal Contribution, C: Conference, P: Preprint

[P1] **Title Anonymized for Double-Blind Review** (Topics: Vision-Language Models, Visual Grounding)

Byeongju Woo, Zilin Wang, **Byeonghyun Pak**, Sangwoo Mo, Stella X. Yu

Submitted to International Conference on Learning Representations (ICLR), 2026

[C3] **Tortoise and Hare Guidance: Accelerating Diffusion Model Inference with Multirate Integration**

Yunhee Lee, **Byeonghyun Pak**, Junwha Hong, Hoseong Kim

Neural Information Processing Systems (NeurIPS), 2025

[C2] **Textual Query-Driven Mask Transformer for Domain Generalized Segmentation**

Byeonghyun Pak*, Byeongju Woo*, Sunghwan Kim*, Dae-hwan Kim, Hoseong Kim

European Conference on Computer Vision (ECCV), 2024

[C1] **B-spline Texture Coefficients Estimator for Screen Content Image Super-Resolution**

Byeonghyun Pak*, Jaewon Lee*, Kyong Hwan Jin

Computer Vision and Pattern Recognition (CVPR), 2023 — Highlight paper (top 2.5%)

Work/Research Experience

Republic of Korea Army (ROKA)

Mar 2023 – Present

First Lieutenant (attached to Agency for Defense Development)

Daejeon, South Korea

- Selected as one of 20 research officers nationwide dedicated to STEM research for national defense
- Planned and executed EO/IR field data collections enabling reliable IR detection evaluation

Agency for Defense Development

Mar 2023 – Present

Research Officer for National Defense (ROND)

Daejeon, South Korea

- *Project: Synthetic-to-Real Domain Generalization for Military Object Detection*
 - Researched domain generalization for reliable infrared imagery object detection in data-scarce settings
 - Improved synthetic-to-real robustness by integrating pre-trained **vision-language models (VLMs)**
 - 1 Publication in ECCV 2024 [[project page](#)]

- *Project: Synthetic Dataset Generation for Air Defense System*
 - Constructed synthetic datasets for rare/low-visibility targets via **image/video diffusion models**
 - Accelerated the generation pipeline by $\approx 30\%$ with a novel multi-rate integration method
 - 1 Publication in NeurIPS 2025

Image Processing Laboratory @ DGIST

Dec 2021 – Feb 2023

Undergraduate Research Intern (advisor: Prof. Kyong Hwan Jin)

Daegu, South Korea

- Researched **implicit neural representations (INRs)** for solving **inverse problems** (e.g., super-resolution)
- *Project: Image Super-resolution for Screen-Content Images*
 - Developed INR-based super-resolution with emphasis on screen-content characteristics and edge fidelity
 - Built a **B-spline INR-based SR pipeline** specialized for screen content
 - 1 Publication in CVPR 2023 (Selected as highlight paper) [[project page](#)]

Honor & Awards

Korea National Scholarship of Excellence in Science and Technology

Mar 2021 – Feb 2023

- National selection: 1 of 20 Research Officers nationwide (1 of 4 in CSE) for defense STEM research

Korea National Scholarship for Undergraduate Study

Mar 2019 – Feb 2023

- Received national scholarship includes full tuition and stipend

Korea Military Academy Superintendent's Award

Dec 2021

- Award for Excellence in National Defense Research Projects
- *Topic: A Study on the Application of Attention Module for Object Tracking Performance Improvement*

1st Place—FriendliAI LLM Hackathon

May 2024

- *Topic: Knowledge Graph-based RAG (Retrieval-Augmented Generation) model*

Patents

B. Pak et al., System for B-Spline Texture Coefficient Estimation and Method for Generating High-Resolution Images Using the Same. **KR 10-2730236** (reg. 2024.11.11).

Academic Services

Conference Reviewer

- Conference on Neural Information Processing Systems (NeurIPS) 2025

Skills

Programming Languages: Python, C/C++ , JavaScript, MATLAB

Frameworks & Tools: PyTorch, TensorFlow, NumPy, Docker, Git, OpenCV, OpenGL, Open3D, ManiSkill

References

Prof. Kyong Hwan Jin, Associate Professor at Korea Univ.

- Email: kyong_jin@korea.ac.kr

Dr. Eunjin Koh, Principal Researcher at ADD

- Email: eikoda@add.re.kr

Dr. Hoseong Kim, Senior Researcher at ADD

- Email: hoseongkim@add.re.kr