

Curriculum Vitae

Status: Research Officer

Affiliation: Agency for Defense Development

Byeonghyun Pak

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Education

Daegu Gyeongbuk Institute of Science and Technology (DGIST)

B.S. in Engineering, School of Undergraduate Studies

Daegu, South Korea

Feb 2019 – Feb 2023

- **Concentration:** Computer Science & Engineering

University of California, Berkeley (UCB)

Summer Visiting Student

Berkeley, CA, USA

Jul 2019 – Aug 2019

Publications

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

[P1] **Aligning Forest and Trees in Images and Long Captions for Visually Grounded Understanding**

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

Under review (2025).

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

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

Neural Information Processing Systems (NeurIPS), 2025. [\[link\]](#)

[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. [\[link\]](#)

[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. [\[link\]](#) **Highlight paper (top 2.5%)**

Experience

Independent Research

Remote

Research Collaborator (with Existential Robotics Lab, UCSD)

Jun 2025 – Present

- Conducting research on **4D neural implicit mapping** for dynamic scene understanding
- Proposed multi-modal scene representations integrating semantics and geometry across time

Agency for Defense Development

Daejeon, South Korea

Research Officer (First Lieutenant, Republic of Korea Army)

Jun 2023 – Present

- Selected as one of 20 research officers nationwide for STEM-based national defense research
- Developed real-time object detection systems for autonomous unmanned aerial vehicles
- **Project:** Synthetic-to-Real Domain Generalization for Object Detection System
 - Researched domain generalization for reliable infrared object detection in data-scarce settings
 - Improved synthetic-to-real robustness by integrating pre-trained **vision-language models**
 - 1 publication in ECCV 2024 [\[project page\]](#)

- **Project:** Synthetic Dataset Generation for Air Defense System
 - Built synthetic datasets for rare or low-visibility targets with **image/video diffusion models**
 - Accelerated the generation pipeline by $\approx 30\%$ with a multi-rate integration method
 - 1 publication in NeurIPS 2025 [[project page](#)]

Image Processing Laboratory, DGIST

Daegu, South Korea

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

Dec 2021 – Feb 2023

- Researched **implicit neural representations** (INRs) for solving inverse problems
- Developed a **B-spline-based INR method** for super-resolving screen-content images
- 1 publication in CVPR 2023 (selected as **highlight paper**) [[project page](#)]

Honor & Awards

Grand Prize, FriendliAI LLM Hackathon

May 2024

- **Project:** Knowledge graph-based RAG system for scalable retrieval of academic papers

Korea National Scholarship of Excellence in Science and Technology

Mar 2021 – Feb 2023

- Full-ride national scholarship awarded to top students in science and engineering

Korea National Scholarship for Undergraduate Study

Mar 2019 – Feb 2023

- National full-tuition scholarship with stipend

Korea Military Academy Superintendent's Award

Dec 2021

- Award for Excellence in national defense research projects
- **Project:** Development of object-tracking models for defense systems

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** (registered 2024-11-11).

Academic Services

Conference Reviewer

- *Neural Information Processing Systems (NeurIPS)* 2025
- *Computer Vision and Pattern Recognition (CVPR)* 2026

Journal Reviewer

- *IEEE Transactions on Medical Imaging (TMI)* 2025

Skills

- **Programming Languages:** Python, C/C++, JavaScript, MATLAB
- **Frameworks & Tools:** PyTorch, TensorFlow, Docker, Git, OpenCV, OpenGL, Open3D, ManiSkill
- **Languages:** Korean (native), English (fluent, TOEFL iBT 106)