Curriculum Vitae

Byeonghyun Pak
Status: Research Officer
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Education

Daegu Gyeongbuk Institute of Science and Technology (DGIST) — Daegu, South Korea
B.S. in Engineering, School of Undergraduate Studies — Feb 2019 – Feb 2023
- **Concentration:** Computer Science & Engineering

University of California, Berkeley (UCB) — Berkeley, CA, USA
Summer Visiting Student — Jul 2019 – Aug 2019

Publications

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

[P1] **Aligning Forest and Trees in Images and Long Captions for Cross-Domain Grounding**
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 ≈**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

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)