Byeongju Woo

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Research Interest

My research interests lie in computer vision and deep learning, with a particular focus on developing systems that emulate human cognitive processes. I aim to create machines that perceive not merely to recognize, but to truly comprehend the physical world. Accordingly, I am currently focusing on the following topics, among others:
— Grounded visual understanding; structured visual priors; robust generalization; context-aware representation

Education

Pohang University of Science and Technology (POSTECH)   Mar 2019 – Feb 2023
B.S. in Computer Science and Engineering   Pohang, South Korea
Summa Cum Laude

Publications

[1] Manuscript under review (vision-language model, grounded scene recognition)
Submitted 2025

[2] **Textual Query-Driven Mask Transformer for Domain Generalized Segmentation**
Byeongju Woo*, Byeonghyun Pak*, Sunghwan Kim*, Dae-hwan Kim, Hoseong Kim
European Conference on Computer Vision (ECCV), 2024

[3] **Human Pose Estimation in Extremely Low-Light Conditions**
Sohyun Lee*, Jaesung Rim*, Boseung Jeong, Geonu Kim, **ByungJu Woo**, Haechan Lee, Sunghyun Cho, Suha Kwak
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2023

Work/Research Experience

Agency for Defense Development   Mar 2023 – Present
Machine Learning Engineer   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
- *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]

Machine Learning Lab @ POSTECH   Aug 2022 – Dec 2022
Undergraduate Research Intern (advisor: Prof. Sungsoo Ahn)   Pohang, South Korea

- Researched topological neural networks incorporating molecular structural priors (e.g., functional group).

Computer Vision Lab @ POSTECH   Dec 2021 – May 2022
Undergraduate Research Intern (advisor: Prof. Suha Kwak)   Pohang, South Korea

- Researched robust human pose estimation in adverse condition (e.g., extremely low-light).
- 1 Publication in CVPR 2023 [project page]

SK Hynix   Jun 2021 - Jul 2021
Computer Vision Intern   Daejeon, South Korea

- Developed an automated algorithm to pre-check for rejects in 3D NAND Flash manufacturing with DL models

Honor, Awards and Scholarship

Director's Award, Agency for Defense Development (ADD)   Dec 2022
- Selected as the 2nd place among 8 national defense research projects.
- *Topic: Autonomous mobile robot with friend-or-foe identification*

Excellence Research Award, POSTECH   Jun 2022
- Selected as the 2nd place among 72 undergraduate CSE research projects.
- *Topic: Human pose estimation in extremely low-light conditions*

Minister's Award, Ministry of Science and ICT   Dec 2021
- Selected as the 1st place among 6 national defense research projects.
- *Topic: Designing adversarial patches to protect friendly forces from deep-learning detectors*

SK Hynix Industry-Academia Scholarship   Sep 2021 - Feb 2023
- **Stipend** scholarship for outstanding performance in industry–academia research.

Korea National Scholarship of Excellence in Science and Technology   Mar 2021 – Feb 2023
- **Full-ride** scholarship for selected research officers in defense science and technology.

Jigok Tuition Scholarship, POSTECH   Mar 2019 - Feb 2021
- **Full-ride** merit-based scholarship for academic excellence.

Academic Services

Conference Reviewer
- International Conference on Learning Representations (ICLR)   2026

Skills

Programming Languages: Python, C/C++, Java, R, MySQL

Frameworks & Tools: PyTorch, TensorFlow, NumPy, OpenCV, Pandas, Docker, Git

Certificate: Engineer Big Data Analysis (acquired Oct. 2023)

References

Prof. Stella Yu, Full Professor, University of Michigan
- Email: stellayu@umich.edu

Prof. Sangwoo Mo, Assistant Professor, POSTECH
- Email: sangwoo.mo@postech.ac.kr

Dr. Hoseong Kim, Senior Researcher, ADD
- Email: hoseongkim@add.re.kr