Kwanyong Park

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Research Interests

My research aims to build robust multi-modal AI models capable of understanding and generating complex real-world scenarios, with a specific focus on co-designing effective data and learning frameworks. My primary research interests include following areas, but also open to exploring other challenging and impactful problems.

- **Scalable and Efficient Learning**
  - Multimodal Learning across Vision (image/video/multi-spectral) and Language
  - Data-efficient Learning with Minimal Human Supervision
- **Data-centric AI**
  - Effective Large-scale Dataset Collection, Generation, and Curation
- **Generative AI**
  - Image/Video Generation
  - Multi-modal Large Language Models

Research Experiences

University of Seoul (UOS) — Seoul, Korea
Assistant Professor, Department of Computer Science and Engineering — Mar.2025–Present

Electronics and Telecommunications Research Institute (ETRI) — Daejeon, Korea
Researcher (Military Service), Visual Intelligence Lab — Sep.2023–Feb.2025

Adobe Research — San Jose, CA
Research Intern (Remote), Deep Learning Group, Creative Intelligence Lab — Apr.2021–Dec.2021

Korea Advanced Institute of Science and Technology (KAIST) — Daejeon, Korea
Graduate Student Researcher, Robotics and Computer Vision Lab — Mar.2018–Aug.2023

Education

Korea Advanced Institute of Science and Technology (KAIST) — Daejeon, Korea
Ph.D. in Electrical Engineering (Advisor: Prof. In So Kweon) — Sep.2019–Aug.2023
- Thesis: "Towards Universal Visual Scene Understanding in the Wild"

Korea Advanced Institute of Science and Technology (KAIST) — Daejeon, Korea
M.S. in Electrical Engineering (Advisor: Prof. In So Kweon) — Mar.2018–Aug.2019
- Thesis: "Learning Unpaired Video-to-video Translation for Domain Adaptation"

Korea Advanced Institute of Science and Technology (KAIST) — Daejeon, Korea
B.S., Double Major in Mechanical Engineering and Electrical Engineering (Magna Cum Laude) — Mar.2013–Feb.2018

Publications

C: conference, J: journal, W: workshop, P: preprint / * equal contribution

[W3] A Multimodal Chain of Tools for Described Object Detection
Kwanyong Park, Youngwan Lee, Yong-Ju Lee
NeurIPS Workshop on Compositional Learning (**NeurIPSW**), 2024

[C14/W2] KOALA: Empirical Lessons Toward Memory-Efficient and Fast Diffusion Models for Text-to-Image Synthesis
Youngwan Lee, **Kwanyong Park**, Yoorhim Cho, Yong-Ju Lee, Sung Ju Hwang
Conference on Neural Information Processing Systems (**NeurIPS**), 2024
Media coverage: covered by YTN, Yonhap News, AI Times, and many local media.
- Short version at "Generative Models for Computer Vision" Workshop in conjunction with CVPR, 2024

[P2] Learning Compositionality from Multifaceted Synthetic Data for Language-based Object Detection
Kwanyong Park, Sojung An, Yong Jae Lee, Donghyun Kim
Under-review at International Journal of Computer Vision (**IJCV**)

[C13/W1] Weak-to-Strong Compositional Learning from Generative Models for Language-based Object Detection
Kwanyong Park, Kuniaki Saito, Donghyun Kim
European Conference on Computer Vision (**ECCV**), 2024
3rd place in the OmniLabel Challenge @ ECCV 2024
- Short version at "Generative Models for Computer Vision" Workshop in conjunction with CVPR, 2024

[C12] MTMMC: A Large-Scale Real-World Multi-Modal Camera Tracking Benchmark
Sanghyun Woo*, **Kwanyong Park***, Inkyu Shin*, Myungchul Kim*, In So Kweon
IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**), 2024

[J2] Test-time Adaptation in the Dynamic World with Compound Domain Knowledge Management
Junha Song, **Kwanyong Park**, Inkyu Shin, Sanghyun Woo, Chaoning Zhang, and In So Kweon
IEEE Robotics and Automation Letters (**RA-L** and **ICRA**), 2024

[J1] Joint Self-supervised Learning and Adversarial Adaptation for Monocular Depth Depth Estimation from Thermal Image
Ukcheol Shin, **Kwanyong Park**, Byeong-Uk Lee, Kyunghyun Lee, In So Kweon
Machine Vision and Applications (**MVA**), 2023

[C11] Mask-guided Matting in the Wild
Kwanyong Park, Sanghyun Woo, Seoung Wug Oh, In So Kweon, Joon-Young Lee
IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**), 2023

[C10] Bidirectional Domain Mixup for Domain Adaptive Semantic Segmentation
Daehan Kim*, Minseok Seo*, **Kwanyong Park**, Inkyu Shin, Sanghyun Woo, In So Kweon, Dong-Geol Choi
AAAI Conference on Artificial Intelligence (**AAAI**), 2023

[C9] Self-supervised Monocular Depth Estimation from Thermal Images via Adversarial Multi-spectral Adaptation
Ukcheol Shin, **Kwanyong Park**, Byeong-Uk Lee, Kyunghyun Lee, In So Kweon
IEEE/CVF Winter Conference on Applications of Computer Vision (**WACV**) (**Oral**), 2023
Received Best Student Paper Award in WACV 2023

[C8] Learning Classifiers of Prototypes and Reciprocal Points for Universal Domain Adaptation
Sungsu Hur, Inkyu Shin, **Kwanyong Park**, Sanghyun Woo, In So Kweon
IEEE/CVF Winter Conference on Applications of Computer Vision (**WACV**), 2023

[C7] Bridging Images and Videos: A Simple Learning Framework for Large Vocabulary Video Object Detection
Sanghyun Woo, **Kwanyong Park**, Seoung Wug Oh, In So Kweon, Joon-Young Lee
European Conference on Computer Vision (**ECCV**), 2022

[C6] Tracking by Associating Clips
Sanghyun Woo, **Kwanyong Park**, Seoung Wug Oh, In So Kweon, Joon-Young Lee
European Conference on Computer Vision (**ECCV**), 2022

[C5] Per-Clip Video Object Segmentation
Kwanyong Park, Sanghyun Woo, Seoung Wug Oh, In So Kweon, Joon-Young Lee
IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**), 2022

[P1] Unsupervised Domain Adaptation for Video Semantic Segmentation
Kwanyong Park*, Inkyu Shin*, Sanghyun Woo, In So Kweon
arXiv, 2021

[C4] LabOR: Labeling Only if Required for Domain Adaptive Semantic Segmentation
Inkyu Shin, Dong-Jin Kim, Jae Won Cho, Sanghyun Woo, **Kwanyong Park**, In So Kweon
IEEE/CVF International Conference on Computer Vision (**ICCV**) (**Oral**), 2021
Received Qualcomm Innovation Fellowship 2021

[C3] Discover, Hallucinate, and Adapt: Open Compound Domain Adaptation for Semantic Segmentation
Kwanyong Park, Sanghyun Woo, Inkyu Shin, In So Kweon
Conference on Neural Information Processing Systems (**NeurIPS**), 2020
Received Qualcomm Innovation Fellowship 2021

[C2] Align-and-Attend Network for Globally and Locally Coherent Video Inpainting
Sanghyun Woo, Dahun Kim, **Kwanyong Park**, Joon-Young Lee, In So Kweon
British Machine Vision Conference (**BMVC**), 2020

[C1] Preserving Semantic and Temporal Consistency for Unpaired Video-to-Video Translation
Kwanyong Park, Sanghyun Woo, Dahun Kim, Donghyeon Cho and In So Kweon
ACM Multimedia (**MM**), 2019

Patents

- Systems and methods for object tracking (US Patent App. 17/657,430)
- Per-clip video object segmentation using machine learning (US Patent App. 17/853,671)

Awards & Honors

- **3rd place in the OmniLabel Challenge @ ECCV2024**, Out of 68 participants — Oct.2024
- **WACV Best Student Paper Awards**, Out of 641 papers (1577 submissions) — Jan.2023
- **Student Representative of RCV Lab** (over 30 members) — Jun.2022–Aug.2023
- **Qualcomm Innovation Fellowship** — Nov.2021
- **KAIST Scholarship**, Scholarship for the Ph.D. program — Sep.2019–Aug.2023
- **SIGMM Student Travel Grants** — Nov.2019
- **Korea Government Scholarship**, Scholarship for the M.S program — Mar.2018–Aug.2019
- **Eun Chong-Kwan Scholarship**, Best M.S students at EE, KAIST — Mar.2018
- **Magna Cum Laude**, Graduation with honors — Feb.2018
- **KAIST Challenge Awards**, Homebuilt Aircraft (Team ICARUS) — May.2016

Research Projects

- **Development of AI Autonomy and Knowledge Enhancement for AI Agent Collaboration** (2023-)
  - Consortium: ETRI, University of Wisconsin-Madison, KAIST, Yonsei University, Korea University
  - Project Goal: Develop multi-agent-based compound intelligence enhancement for self-evolving AI.
  - Related Publication: [C13/W1], [W3]
- **Development of Large Korean Language Model Technology for Efficient Pre-training** (2023-)
  - Consortium: ETRI, University of Wisconsin-Madison, KAIST, GIST, Woongjin

  - Project Goal: Develop efficient multi-modal AI models for Korean.
  - Related Publication: [C13/W1], [C14/W2]
- **Development of Intelligent COVID-19 Probe Circulation and Data Listing Technology** (2020-2023)
  - Consortium: KAIST, KIST, Seoul National University Bundang Hospital, Miru Systems
  - Project Goal: Develop AI-driven surveillance systems designed to monitor, detect, and manage COVID-19.
  - Related Publication: [C5], [C6], [C12]
- **Data Dam Project: Large-Scale AI Dataset Construction for Multi-Sensor Tracking** (2021)
  - Consortium: KAIST, Testworks, Miru Systems
  - Project Goal: Construct a large-scale dataset for AI-driven multi-sensor tracking.
  - Related Publication: [C12]
- **Development of AI Algorithms for Cross-Domain Data Utilization** (2020-2023)
  - Consortium: KAIST, Samsung Electronics
  - Project Goal: Develop data-efficient learning algorithms using data from different domains.
  - Related Publication: [C3], [C4], [P1], [C7], [C11]
- **Development of Efficient Deep Learning Meta-architecture for Video Application** (2018-2020)
  - Consortium: KAIST, Samsung Electronics
  - Project Goal: Develop efficient and scalable architecture for video recognition, synthesis, and editing.
  - Related Publication: [C1], [C2]

Academic Activities

- Conference Reviewer
  - CVPR (2022-), ICCV (2023-), ECCV (2022-), NeurIPS (2024-), ICLR (2025-), ICML (2025-), AAAI (2023-), BMVC (2020-)
- Journal Reviewer
  - TPAMI (2022-), TNNLS (2024-), TMM (2023-)
- Invited Talks
  - Institute of Embedded Engineering of Korea (Nov 2024)
  - Korea Artificial Intelligence Conference (Sep 2024)

Teaching

Assistant Professor at UOS CS

- Probability and Statistics (Spring, 2025)
- Introduction to Programming (Spring, 2025)

Teaching Assistant at KAIST EE

- Electronics Design Lab.<Network of Smart Things> (Spring, 2019)
- Programming Structure for Electrical Engineering (Fall, 2018)
- Introduction to Electronics Design Lab. (Fall, 2018)

Mentoring

- Junha Song (MS @ KAIST). Co-advised a project, paper accepted at RAL-ICRA'24
- Daehan Kim & Minseok Seo (MS @ Hanbat National University). Co-advised a project, paper accepted at AAAI'23
- Sungsu Hur (MS @ KAIST). Co-advised a project, paper accepted at WACV'23