Kwanyong Park

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Research Interests

My research goal is to advance the field of computer vision and machine learning, with a focus on creating robust visual recognition/generation systems in a data-efficient manner. Specifically, I am interested in the following research topics, but also open to other explorable/challenging domains.

- **Scalable and Efficient Learning**; Multi-modal Learning, Data-efficient Learning
- **Generative AI**; Image/Video Generation, Multimodal Large Language Models
- **Visual Recognition**; Video Understanding and Processing

Research Experiences

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

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
Research Assistant, 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

[W2] Learning Compositional Language-based Object Detection with Diffusion-Based Structured Synthetic Data
Kwanyong Park, Kuniaki Saito, Donghyun Kim
Under-review, 2024
- Also presented at "Generative Models for Computer Vision" Workshops in conjuction 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

[W1] KOALA: Fast and Memory-Efficient Latent Diffusion Models via Self-Attention Distillation
Youngwan Lee, **Kwanyong Park**, Yoorhim Cho, Yong-Ju Lee, Sung Ju Hwang
Media coverage: covered by YTN, Yonhap News, AI Times, and many local media.
Under-review, 2024
- Also presented at "Generative Models for Computer Vision" Workshops in conjuction with 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
Received Best Student Paper Award in WACV 2023
IEEE/CVF Winter Conference on Applications of Computer Vision (**WACV**) (**Oral**), 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
Received Qualcomm Innovation Award 2021
IEEE/CVF International Conference on Computer Vision (**ICCV**) (**Oral**), 2021

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

[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

- WACV Best Student Paper Awards — Jan.2023
- Student Representative of RCV Lab (over 30 members) — Jun.2022–Aug.2023
- Qualcomm Innovation Fellowship — Nov.2021
- KAIST Scholarship — Sep.2019–Aug.2023
- SIGMM Student Travel Grants — Nov.2019
- Korea Government Scholarship — Mar.2018–Aug.2019
- Best M.S students, Eun Chong-Kwan Scholarship — Mar.2018

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: [P3]
- **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: [P2], [P3]
- **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 Service

- Journal Reviewer
  - TPAMI (2022-), TMM (2023-)
- Conference Reviewer
  - CVPR (2022-), ICCV (2023-), ECCV (2022-), AAAI (2023-), BMVC (2020-)

Teaching

Teaching Assistant at KAIST EE

- EE405 Electronics Design Lab.<Network of Smart Things> (Spring, 2019)
- EE209 Programming Structure for Electrical Engineering (Fall, 2018)
- EE305 Introduction to Electronics Design Lab. (Fall, 2018)

References

Prof. In So Kweon (M.S. - Ph.D. advisor at KAIST)
KEPCO Chair Professor, School of Electrical Engineering, KAIST
Email: iskweon77@kaist.ac.kr

Dr. Joon-Young Lee (Internship mentor)
Senior Research Scientist, Adobe Research
Email: jolee@adobe.com

Dr. Seoung Wug Oh (Internship mentor)
Research Scientist, Adobe Research
Email: seoh@adobe.com