Kwanyong Park

Website: pkyong95.github.io
Email: pkyong7@etri.re.kr

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

[C13/W2] 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
- 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

[W1] 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
Media coverage: covered by YTN, Yonhap News, AI Times, and many local media.
Under-review, 2024
- Short version at "Generative Models for Computer Vision" Workshop in conjunction 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: [C13/W2]
- **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: [W1], [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 Service

- Journal Reviewer
  - TPAMI (2022-), TMM (2023-)
- Conference Reviewer
  - CVPR (2022-), ICCV (2023-), ECCV (2022-), NeurIPS (2024-), 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)

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

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