

Youngtaek Oh

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Research Interest

My research centers on developing data-efficient and robust recognition systems that address limitations and biases in image and video data. I am currently focusing on enhancing vision-language models to improve compositional reasoning and multi-modal understanding for more robust and comprehensive recognition systems.

Keywords: Data-Efficient Learning, Multi-Modal Learning, Vision-Language Models

Education

Korea Advanced Institute of Science and Technology (KAIST)	Daejeon, South Korea
Ph.D. in Electrical Engineering	Sep. 2021 – Present
◦ Co-Advisors: Prof. In So Kweon and Prof. Junmo Kim	
M.S. in Electrical Engineering	Mar. 2019 – Feb. 2021
◦ Advisor: Prof. In So Kweon	
Korea University	Seoul, South Korea
B.S. in Electrical Engineering	Mar. 2015 – Feb. 2019
◦ GPA: 4.40/4.50	

Publications (*equally contributed authors; †corresponding authors)

Workshop and Preprints

- [W2] [Exploring the Spectrum of Visio-Linguistic Compositionality and Recognition](#)
Youngtaek Oh, Pyunghwan Ahn, Jinhyung Kim, Gwangmo Song, Soonyoung Lee[†], In So Kweon[†], Junmo Kim[†]
 in **CVPRW 2024**: ‘What is Next in Multimodal Foundation Models?’ (**MMFM**) Workshop
- [W1] [Technical Report: Retrieval-based Data Discovery and Fusion for Zero-shot Image Captioning](#)
Youngtaek Oh, Jae Won Cho, Dong-Jin Kim, In So Kweon[†], Junmo Kim[†]
 in **CVPRW 2023**: ‘New Frontiers for Zero-shot Image Captioning Evaluation’ (**NICE**) Workshop
 2nd place in Zero-Shot Image Captioning Challenge in NICE Workshop

Peer-Reviewed Conferences and Journals

- [C6] [Preserving Multi-Modal Capabilities of Pre-trained VLMs for Improving Vision-Linguistic Compositionality](#)
Youngtaek Oh, Jae Won Cho, Dong-Jin Kim, In So Kweon[†], Junmo Kim[†]
 in **EMNLP 2024**: Conference on Empirical Methods in Natural Language Processing
 Oral presentation
- [J1] [Empirical study on using Adapters for debiased Visual Question Answering](#)
 Jae Won Cho, Dawit Mureja Argaw, **Youngtaek Oh**, Dong-Jin Kim, In So Kweon
 in **CVIU 2023**: Computer Vision and Image Understanding (IF=4.3)
- [C5] [Self-Sufficient Framework for Continuous Sign Language Recognition](#)
 Youngjoon Jang, **Youngtaek Oh**, Jae Won Cho, Myungchul Kim, Dong-Jin Kim, In So Kweon, Joon Son Chung
 in **ICASSP 2023**: IEEE International Conference on Acoustics, Speech and Signal Processing
 Oral presentation, Top 3% Paper Recognition
- [C4] [Signing Outside the Studio: Benchmarking Background Robustness for Continuous Sign Language Recognition](#)
 Youngjoon Jang, **Youngtaek Oh**, Jae Won Cho, Dong-Jin Kim, Joon Son Chung, In So Kweon
 in **BMVC 2022**: British Machine Vision Conference

- [C3] [DASO: Distribution-Aware Semantics-Oriented Pseudo-Label for Imbalanced Semi-Supervised Learning](#)
Youngtaek Oh, Dong-Jin Kim, In So Kweon
in **CVPR 2022**: IEEE/CVF Conference on Computer Vision and Pattern Recognition
Finalist, Qualcomm Innovation Fellowship Korea, 2022
- [C2] [KSL-Guide: A Large-scale Korean Sign Language Dataset Including Interrogative Sentences for Guiding the Deaf and Hard-of-Hearing](#)
Soomin Ham, Kibaek Park, Youngjoon Jang, **Youngtaek Oh**, Seokmin Yun, Sukwon Yoon, Chang Jo Kim, Han-Mu Park, In So Kweon
in **FG 2021**: IEEE International Conference on Automatic Face and Gesture Recognition
- [C1] [SideGuide: A Large-scale Sidewalk Dataset for Guiding Impaired People](#)
Kibaek Park*, **Youngtaek Oh***, Soomin Ham*, Kyungdon Joo*, Hyokyung Kim, Hyoyoung Kum, In So Kweon
in **IROS 2020**: International Conference on Intelligent Robots and Systems

Work Experience

Research Intern LG AI Research	Sep. 2023 – Feb. 2024 Seoul, South Korea
◦ Worked on vision-language compositionality; Outcome: Paper [W2] and Software [S3]	
Graduated Researcher Korea Advanced Institute of Science and Technology (KAIST)	Mar. 2021 – Aug. 2021 Daejeon, South Korea

Projects





Developing and Demonstrating Innovative Products Based on Public Demand funded by the Ministry of Science and ICT (MSIT), Korea	Nov. 2021 – Present
◦ Consortium: KAIST, Hanbat National University, Miru Systems, Hanulsoft, Datamaker, Daejeon Transportation	
◦ Objective: Develop a real-time system for masking and unmasking personal information in public CCTV services.	
◦ Role: Designed a deep steganography algorithm to conceal and reveal personal information (face and license plate).	
Korean Sign Language Dataset for AI Interpretation funded by the National Information Society Agency (NIA), Korea	May 2020 – Dec. 2020
◦ Consortium: KAIST, Korea Association of the Deaf, Testworks, Korea Nazarene University, EQ4ALL	
◦ Objective: Establish a large-scale Korean Sign Language dataset for real-world use in sign language recognition.	
◦ Role: Developed a continuous sign language recognition model compatible with Korean Sign Language datasets.	
◦ Outcome: Publications ([C2], [C4], [C5]), dataset (KSL-Guide ↗ , <i>available to Koreans only</i>)	
Korean Sidewalk Image Dataset for AI Assistance to the Visually Impaired funded by the National Information Society Agency (NIA), Korea	May 2019 – Dec. 2019
◦ Consortium: KAIST, Korea Spinal Cord Injury Association, Testworks, SelectStar, DTWORESOURCE	
◦ Objective: Construct a dataset for sidewalk environments to enhance mobility rights for individuals with disabilities.	
◦ Role: Designed the sidewalk obstacle dataset and validated it using object recognition models.	
◦ Outcome: Publications ([C1]), dataset (SideGuide ↗ , <i>available upon request: application ↗</i>)	

Honors and Awards

Top 3% Recognition Certificates, ICASSP 2023	June 2023
Second place in the 2023 NICE Challenge at the NICE Workshop, CVPR 2023 (\$5,000)	May 2023
Finalist, Qualcomm Innovation Fellowship Korea	Nov. 2022
Outstanding Reviewer Award, ECCV 2022	Oct. 2022
National Scholarship for Science and Engineering (<i>full tuition, merit-based</i>)	Mar. 2017 – Feb. 2019

Softwares

Open-Sourced PyTorch Implementations

- [S4]  **fsc-clip**: Implementations of training CLIP models with hard negative captions, related to [W2], [C6].
 - Supports training on 3 image-text datasets with unified evaluation using **vl_compo**.
- [S3]  **vl_compo**: A unified evaluation toolkit for compositional reasoning and multi-modal tasks, related to [W2], [C6].
 - Incorporates a wide range of models and benchmarks for evaluation, continuously evolving to stay up-to-date.
- [S2]  **retriever**: An implementation of the second-place solution in the 2023 NICE Challenge, related to [W1].
 - Enhances BLIP-2 with retrieval-augmented image captioning for world knowledge and specific details.
- [S1]  **daso**: A unified codebase for semi-supervised learning (SSL), related to [C3].
 - Supports training of SSL algorithms, including techniques for class-imbalance.
 - Integrates 6 base SSL algorithms and 4 class-imbalanced methods within a single codebase.

Academic Services

Conference Reviewer

- Conference on Computer Vision and Pattern Recognition (**CVPR**): 2022 – 2024
- European Conference on Computer Vision (**ECCV**): 2022 (**Outstanding**), 2024
- International Conference on Computer Vision (**ICCV**): 2023
- Conference on Neural Information Processing Systems (**NeurIPS**): 2023, 2024
- International Conference on Learning Representations (**ICLR**): 2024, 2025
- Winter Conference on Applications of Computer Vision (**WACV**): 2024, 2025
- International Conference on Acoustics, Speech, and Signal Processing (**ICASSP**): 2024, 2025
- AAAI Conference on Artificial Intelligence (**AAAI**): 2025

Journal Reviewer

- International Journal of Computer Vision (**IJCV**): 2024

Teaching Experience

Teaching Assistant (TA) at EE, KAIST

- EE735: Computer Vision (Fall, 2020)
- EE898: Advanced Topics in Deep Learning for Robotics and Computer Vision (Spring, 2020)
- EE405: Electronics Design Lab (Fall, 2019)

References

Prof. In So Kweon: M.S. Advisor and Ph.D. Co-Advisor

- Affiliation: School of Electrical Engineering, KAIST
- Email: iskweon77@kaist.ac.kr

Prof. Junmo Kim: Ph.D. Co-Advisor

- Affiliation: School of Electrical Engineering, KAIST
- Email: junmo.kim@kaist.ac.kr

Dr. Pyungwhan Ahn: Internship Mentor

- Affiliation: Multimodal Lab, LG AI Research
- Email: p.ahn@lgresearch.ai

Prof. Dong-Jin Kim: Collaborator

- Affiliation: Department of {Data Science, Computer Science, Artificial Intelligence}, Hanyang University
- Email: djdkim@hanyang.ac.kr

Prof. Jae Won Cho: Collaborator

- Affiliation: Department of Artificial Intelligence and Data Science, Sejong University
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