YOUNGRAE KIM

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EDUCATION

Korea Advanced Institute of Science and Technology (KAIST) Mar.2022 - Anticipated Feb.2024
M.S. in School of Computing
Cumulative GPA: 3.66/4.3 (3.62/4.0)
Advisor: Prof. Dongman Lee

Hongik University Mar.2016 - Feb.2022
B.S. in Computer Engineering
Cumulative GPA: 4.01/4.5 (3.73/4.0) (Ranked top 5%)
Major GPA: 4.2/4.5 (3.85/4.0)
Advisor: Prof. Young Yoon

RESEARCH INTERESTS

My research focuses on improving data efficiency through the utilization of techniques for acquiring learning signals from either few-shot labeled data or unlabeled data. Recently, I'm interested in developing adaptation techniques without any labeled data in an online manner. I'm also interested in enriching the representation of video models.
Keywords: Computer Vision, Data Efficiency, Scene/Video Understanding

PUBLICATIONS

Language Supportive Test-Time Adaptation on Semantic Segmentation
To be submitted to CVPR 2024

Disentangled Video Representation Learning
To be submitted to CVPR 2024

MetaWeather: Few-Shot Weather-Degraded Image Restoration via Degradation Pattern Matching
Youngrae Kim*, Younggeol Cho*, and Dongman Lee [Link]
arXiv, AAAI 2024 Under Review

Efficient Reference-based Video Super-Resolution (ERVSR): Single Reference Image Is All You Need
Youngrae Kim*, Hoonhee Cho*, Jinsu Lim*, Minji Lee*, Ho-Jin Choi, Kuk-Jin Yoon, and Dongman Lee [Link]
2023 IEEE/CVF Winter Conference on Applications of Computer Vision (WACV 2023)

RESEARCH EXPERIENCES

Test-Time Adaptation on Semantic Segmentation, KAIST Aug. 2023 - Present
- Proposed to utilize the language model as a learning signal where explicit learning signals do not exist in the test-time adaptation task.
- Polished the learning signal to fit into the semantic segmentation feature space.

Disentangled Video Representation Learning, Kyunghee University May. 2023 - Present
- Collaborated with Professor Jinwoo Choi's group at Kyunghee University.
- Clarified the problem by investigating the limitations of standard video models, which often prioritize the foreground while neglecting the background in videos.

Few-Shot Learning on Weather-Degraded Image Restoration, KAIST Feb. 2023 - Aug. 2023
- Suggested that in the absence of sufficient labeled data, image restoration models should prioritize learning degradation patterns over background distribution. This proposal is based on the assumption that degradation patterns are only the common factor shared among the limited few-shot images available for adaptation.
- Applied the matching network paradigm to our model to enable the model to build generalized knowledge with episodic meta-learning method.

- Achieved SOTA in weather-degraded few-shot image restoration task and wrote a paper for submission to AAAI 2024.

Efficient Video Super-Resolution, CS570 AI & ML, KAIST Apr. 2022 - Aug. 2022
- Worked with another graduate student in CS570 AI & ML course instructed by Prof. Tae-Kyun Kim and found a problem in existing reference-based video super-resolution task, which is low computational efficiency.
- Contributed to the ideation that only one frame would suffice as a reference feature instead of all frames.
- Focused on extracting the full features of the one reference frame and transferring the feature to all frames.
- Significantly improved computational efficiency with comparable accuracy with existing SOTA model. With this achievement, this work is accepted to WACV 2023.

Taxi Dispatch System for maximizing profits, Hongik University Jul. 2020 - Dec. 2021
- Researched the development of a taxi dispatching strategy to maximize profits.
- Processed raw sensor data and implemented and conducted experiments using realistic simulations to evaluate the effectiveness of various dispatching strategies.

HONORS AND AWARDS

National Scholarship for Science and Engineering Mar.2022 - Present
Tuition and stipend supported by Korea government - 41,605,460 KRW (30,000 $)
Best TA Award Feb.2023
Data Structure (CS206) course, School of Computing, KAIST
Academic Scholarships Mar.2016 - Feb.2022
Awarded scholarships for every semester, Hongik University - 14,400,000 KRW (10,000 $)

ACADEMIC SERVICES

Reviewer Sep. 2023
IEEE Transactions on Circuits and Systems for Video Technology (TCSVT)

TEACHING EXPERIENCE

Teaching Assistant Fall 2022
Data Structure (CS206) course, School of Computing, KAIST
Teaching Assistant Spring 2022
Operating System (CS330) course, School of Computing, KAIST

SKILLS

Programming Languages Python, C/C++, JAVA, Verilog
Frameworks PyTorch, Docker, Triton Inference Server, gRPC

REFERENCES

Prof. Dongman Lee
Professor of School of Computing at KAIST, Vice President of KAIST, **Email**: dlee@kaist.ac.kr
Prof. Tae-Kyun Kim
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