YOUNGRAE KIM

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EDUCATION

University of Southern California (USC) — **Los Angeles, CA, USA**
Ph.D. in Computer Engineering — Aug. 2024 – Present
- Advisor: Prof. C.-C. Jay Kuo

Korea Advanced Institute of Science and Technology (KAIST) — **Daejeon, Korea**
M.S. in Computer Science — Feb. 2022 – Feb.2024
- Advisor: Prof. Dongman Lee
- Thesis: "Few-Shot Weather-Degraded Image Restoration"
- Full-tuition Government Scholarship for Science and Engineering

Hongik University — **Seoul, Korea**
B.S. in Computer Engineering — Mar. 2016 – Feb. 2022
- Academic Excellence Scholarship for 7 semesters
- Leave of absence for military service: Mar. 2018 – Feb. 2020 (2 years)

RESEARCH INTERESTS

Image/Video Understanding, Domain Adaptation, Learning with Limited Supervision

PUBLICATIONS

1. Bae, K.H.*, Ahn G.O.*, **Kim, Y.R*.**, et al. "DEVIAS: Learning Disentangled Video Representations of Action and Scene." *European Conference on Computer Vision* **ECCV 2024** (**Oral** Presentation, **2.3% acceptance rate**). [Link]

2. **Kim, Y.R.*,** Cho, Y.G.*, Nguyen, T.T., Lee, D.M. "MetaWeather: Few-Shot Weather-Degraded Image Restoration." *European Conference on Computer Vision* **ECCV 2024.** [Link]

3. Cho, Y.G.*, **Kim, Y.R.*,** Lee, D.M. "Beyond Entropy: Style Transfer Guided Single Image Continual Test-Time Adaptation." *European Conference on Computer Vision* **ECCV 2024** Workshop on Vision-Centric Autonomous Driving**.** [Link]

4. **Kim, Y.R.*,** Cho, H.H.*, Lim, J.S.*, Lee, M.J.*, et al. "Efficient Reference-based Video Super-Resolution (ERVSR): Single Reference Image is All You Need." *IEEE/CVF Winter Conference on Applications of Computer Vision* **WACV 2023** (**Oral** presentation)**.** [Link]

(* denotes equal contributions)

PREPRINTS

Cho, Y.G.*, **Kim, Y.R.***, Yoon, J.H., Hong, S.H., Lee, D.M. "Feature Augmentation based Test-Time Adaptation." *Under review.*

(* denotes equal contributions)

RESEARCH EXPERIENCE

KAIST CDSN Lab (Advisor: Prof. Dongman Lee) — **Daejeon, Korea**
Few-Shot Learning on Weather-Degraded Image Restoration — Feb. 2023 – Mar. 2024
- Firstly proposed the need for few-shot learning in the area of weather-degraded image restoration.
- Suggested prioritization of learning degradation patterns over background distribution by image restoration models without sufficient labeled data, assuming that degradation patterns are only the common factor among the limited few-shot images available for adaptation.
- Demonstrated that our performance is comparable to that of many samples; published results on **ECCV 2024.**

Stable Test-Time Adaptation Aug. 2023 – Mar.2024

- Stabilized the adaptation process even with a single image, interpolating the statistics of the target domain.

Data-Efficient Test-Time Adaptation Mar. 2024 – Jul.2024

- Fully utilized the limited number of reliable samples efficiently by using the feature augmentation technique.

Kyung Hee University VLL Lab (Prof. Jinwoo Choi's group) **Suwon, Korea**

Disentangled Video Representation Learning May 2023 – Mar. 2024

- Examined typical video modes' limitations and clarified they are often biased to background or neglect the background in videos, which leads to inaccurate prediction or information loss.
- Proposed a novel encoder-decoder framework for disentangling both representations.
- Showed the disentangled and effective representations in our experiments; published results on **ECCV 2024.**

KAIST CS570 AI & ML Course (Advisor: Prof. Tae-kyun Kim) **Daejeon, Korea**

Efficient Video Super-Resolution Apr. 2022 – Aug. 2022

- Identified the issue of low computational efficiency in existing reference-based video super-resolution task.
- Determined the suitability/sufficiency of a single frame as a reference feature instead of all frames.
- Extracted the full features of one reference frame and transferred the feature to all frames.
- Greatly improved computational efficiency with minimal performance impact; published results on **WACV 2023**.

ACADEMIC SERVICE

Reviewer, Association for the Advancement of Artificial Intelligence Conference (AAAI)
Reviewer, IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)
Reviewer, IEEE Transactions on Circuits and Systems for Video Technology (TCSVT)

TEACHING ASSISTANTSHIPS

Korea Advanced Institute of Science and Technology (KAIST) **Daejeon, Korea**
"CS206 Data Structure", School of Computing – *Best TA Award* Fall 2022
"CS330 Operating System", School of Computing Spring 2022

PROFICIENCY IN SKILLS

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

MILITARY EXPERIENCE

Honorable Discharge as a Sergeant, Republic of Korea Air Force, Cheongju**,** Korea Apr. 2018 – Mar. 2020

REFERENCES

Dongman Lee, *Professor*, KAIST School of Computing, (dlee@kaist.ac.kr)
Seunghoon Hong, *Assistant Professor*, KAIST School of Computing, (seunghoon.hong@kaist.ac.kr)
Jinwoo Choi, *Assistant Professor*, Kyung Hee University Science & Engineering (jinwoochoi@khu.ac.kr)