

# YOUNGRAE KIM

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## EDUCATION

### University of Southern California (USC)

Los Angeles, CA, USA

*Ph.D. in Computer Engineering*

From Aug. 2024

- 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

- GPA: 3.66/4.3 (3.62/4.0), 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

- CGPA: 4.01/4.5 (3.74/4.0), Major GPA: 4.2/4.5 (3.86/4.0)
- Academic Excellence Scholarship for 7 semesters

## RESEARCH INTERESTS

Domain Adaptation, Few-shot Learning, Image/Video Understanding

## PREPRINTS

**Kim, Y.R.\***, Cho, Y.G.\*, Nguyen, T.T., Lee, D.M. "MetaWeather: Few-Shot Weather-Degraded Image Restoration." *Under review*. [\[Link\]](#)

**Kim, Y.R.\***, Ahn G.O.\*, Bae, K.H.\*, et al. "DEVIAS: Learning Disentangled Video Representations of Action and Scene." *Under review*. [\[Link\]](#)

**Kim, Y.R.\***, Cho, Y.G.\*, Lee, D.M. "Beyond Entropy: Style Transfer Guided Single Image Continual Test-Time Adaptation." *Under review*. [\[Link\]](#)

(\* denotes equal contributions)

## PUBLICATIONS

**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*. [\[Link\]](#)

(\* denotes equal contributions)

## RESEARCH EXPERIENCE

**KAIST CDSN Lab** (Advisor: Prof. Dongman Lee)

Daejeon, Korea

*Test-Time Adaptation with Style Transfer*

Aug. 2023 – Present

- Formulated the test-time adaptation problem as a style transfer problem with novel losses.
- Stabilized the adaptation process even with a single image, interpolating the statistics of the target domain.

*Few-Shot Learning on Weather-Degraded Image Restoration*

Feb. 2023 – Mar. 2024

- 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.
- Applied a matching network paradigm to the model to build generalized knowledge using episodic meta-learning.

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

**Suwon, Korea**

***Disentangled Video Representation Learning.***

May 2023 – Nov. 2023

- Examined standard video modes' limitations and clarified they often prioritize the foreground while neglecting the background in videos, which leads to information loss.
- Proposed a novel auxiliary task that significantly improves performance.
- Showed the disentangled and effective representations in our experiments.

**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**.

**Hongik University APL Lab** (Advisor: Prof. Young Yoon)

**Seoul, Korea**

***Taxi Dispatch System for Maximizing Profits***

Jul. 2020 – Dec. 2021

- Processed raw sensor data; implemented and conducted experiments using realistic simulations to evaluate the effectiveness of various dispatching strategies.

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**ACADEMIC SERVICE**

*Reviewer, IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*

*Reviewer, IEEE Transactions on Circuits and Systems for Video Technology (TCSVT)*

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**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

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**PROFICIENCY IN SKILLS**

**Programming:** Python, C/C++, JAVA, Verilog

**Frameworks:** PyTorch, Docker, Triton Inference Server, gRPC

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**MILITARY EXPERIENCE**

*Honorable Discharge as a Sergeant, Republic of Korea Air Force, Cheongju, Korea*

Apr. 2018 – Mar. 2020

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**REFERENCES**

Dongman Lee, *Professor*, KAIST School of Computing, Vice President of KAIST (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)