

# YOUNGRAE KIM

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## EDUCATION

### University of Southern California (USC)

Ph.D. in Computer Engineering (Advisor: Prof. Jay Kuo)

Los Angeles, CA, USA

Aug. 2024 – Present

### Korea Advanced Institute of Science and Technology (KAIST)

M.S. in Computer Science (Advisor: Prof. Dongman Lee)

Daejeon, Korea

Feb.2022 – Feb.2024

– Thesis: "Few-Shot Weather-Degraded Image Restoration"

### Hongik University

B.S. in Computer Engineering (Advisor: Prof. Young Yoon)

Seoul, Korea

Mar.2016 – Feb.2022

– Major GPA: 98.41%; Cumulative GPA: 95.10%

## RESEARCH INTERESTS

My research interests primarily lie in **computer vision**, **multi-modality** and **machine learning**. Specifically:

- **Controllable representation**: Modern AI models contain biased and non-transparent representations, leading to potentially catastrophic results. I am interested in developing a learning framework for unbiased, interpretable, and versatile representations.
- **Optimization through interaction with the surroundings**: Although a large dataset is used to train the model, the extremely dynamic real world contains a distribution of blind spots that typical models cannot address. I am interested in detecting this gap and optimizing a model by interacting with its surroundings.

## PUBLICATIONS

### 1. DEVIAS: Learning Disentangled Video Representations of Action and Scene

**Youngrae Kim\***, Kyungho Bae\*, Geo Ahn\*, Jinwoo Choi

*European Conference on Computer Vision (ECCV) 2024* – (Oral Presentation, 2.3% acceptance rate)

### 2. MetaWeather: Few-Shot Weather-Degraded Image Restoration

**Youngrae Kim\***, Yeonggeol Cho\*, Thanh-Tung Nguyen, Seunghoon Hong, Dongman Lee

*European Conference on Computer Vision (ECCV) 2024*

### 3. Beyond Entropy: Style Transfer Guided Single Image Continual Test-Time Adaptation

Yeonggeol Cho\*, **Youngrae Kim\***, Dongman Lee

*Workshop on Vision-Centric Autonomous Driving at European Conference on Computer Vision (ECCV) 2024*

### 4. Feature Augmentation based Test-Time Adaptation

Yeonggeol Cho\*, **Youngrae Kim\***, Junho Yoon, Seunghoon Hong, Dongman Lee

*IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) 2025*

### 5. Efficient Reference-based Video Super-Resolution (ERVSR): Single Reference Image is All You Need

**Youngrae Kim\***, Jinsu Lim\*, Hoonhee Cho\*, Minji Lee\*, Dongman Lee, Kuk-Jin Yoon, Ho-Jin Choi

*IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) 2023* – (Oral Presentation)

### 6. Zone-Agnostic Greedy Taxi Dispatch Algorithm Based on Contextual Matching Matrix for Efficient Maximization of Revenue and Profit

**Youngrae Kim**, Young Yoon

*Electronics 2021*

(\* denotes equal contribution)

## RESEARCH EXPERIENCE

### USC Media Communications Lab

Aug. 2024 – Present

Graduate Research Assistant, Advisor: Prof. Jay Kuo

- Developed a Federated Learning framework to support a modularized, successive machine learning pipeline.
- Investigated methods to enhance neural network robustness against noise and variation introduced by analog neural network hardware.

## KAIST CDSN Lab

Mar. 2022 – Jul. 2024

*Graduate Research Assistant*, Advisor: [Prof. Dongman Lee](#), [Prof. Seunghoon Hong](#)

- Designed a universal few-shot learner for arbitrary adverse weather, using the matching paradigm for meta-learning.
- Formulated a loss function to solve an ill-posed problem in typical entropy loss functions in test-time adaptation.
- Developed a test-time adaptation method that maximizes the use of limited samples after filtering out.

## Kyung Hee University VLL Lab

May 2023 – Mar. 2024

*Research Collaborator*, Advisor: [Prof. Jinwoo Choi](#)

- Investigated typical video models' limitations and clarified they are often biased to background or neglect the background in videos, which leads to inaccurate prediction or information loss.
- Developed a framework for disentangling both action and scene representations in a disentangled manner, leading to more holistic video understanding.

## KAIST CS570 AI & ML Course

Apr. 2022 – Aug. 2022

Advisor: [Prof. Tae-Kyun Kim](#)

- Developed a computational-efficient reference-based video super-resolution model, determining the sufficiency of a single frame as a reference feature instead of all frames.

## Hongik University APL Lab

Jul. 2020 – Dec. 2021

*Research Intern*, Advisor: [Prof. Young Yoon](#)

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

## FELLOWSHIPS AND HONORS

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Best Paper Award, Korea Computer Congress	Jun. 2024
Full-tuition Government Scholarship for Science and Engineering, KAIST	2022 – 2024
Best TA Award, KAIST	Fall 2022
Academic Excellence Scholarship for 7 semesters, Hongik University	2016 – 2022

## ACADEMIC SERVICES

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*Reviewer*, IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) 2024, 2025  
*Reviewer*, Association for the Advancement of Artificial Intelligence Conference (AAAI) 2025  
*Reviewer*, IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) 2025  
*Reviewer*, IEEE Transactions on Circuits and Systems for Video Technology (TCSVT)

## TEACHING

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<i>Teaching Assistant</i> , CS206 Data Structure, KAIST	Fall 2022
<i>Teaching Assistant</i> , CS330 Operating System, KAIST	Spring 2022

## MILITARY EXPERIENCE

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