# Gwanghan Lee

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## Interests

**Model Compression, Model Pruning, Computer Vision, Deep Learning**

## EDUCATION

**Sungkyunkwan University (SKKU)** — **Suwon, Korea**
*MS* in *Department of Artificial Intelligence* — *03/2020 – 08/2023 (anticipated graduation)*

**Konkuk University** — **Seoul, Korea**
*BS/MS* in *Organic and Nano System Engineering* — *03/2011 – 02/2019*

## PUBLICATIONS

### International Conference

1. **"Real-Time User-guided Adaptive Colorization with Vision Transformer."**
   Gwanghan Lee*, Saebyeol Shin*, Taeyoung Na, and Simon S. Woo.
   Winter Conference on Applications of Computer Vision (WACV), 2024

2. **"A-ColViT: Real-time Interactive Colorization by Adaptive Vision Transformer."**
   Gwanghan Lee*, Saebyeol Shin*, Donggeun Ko, and Simon S. Woo.
   International Workshop on Practical Deep Learning in the Wild at (AAAI), 2023.

3. **"Accelerating CNN via Dynamic Pattern-based Pruning Network."**
   Gwanghan Lee, Saebyeol Shin, and Simon S. Woo.
   ACM International Conference on Information & Knowledge Management (CIKM), 2022.

4. **"EMGNet: Efficient Multi-Scale Feature Generation Adaptive Network."**
   Gwanghan Lee, Minha Kim, Minha Kim, and Simon S. Woo.
   International Conference on Information and Knowledge Management (CIKM), 2021.

5. **"Exploring Group Sparsity using Dynamic Sparse Training"**
   Geunhye Jo, Gwanghan Lee, and Dongkun Shin.
   IEEE International Conference on Consumer Electronics Asia (ICCE-Asia), 2020.

### International Journal

1. **"Development of fashion recommendation system using collaborative deep learning"**
   Gwanghan Lee*, Sungmin Kim*, and Chang Kyu Park*.
   International Journal of Clothing Science and Technology (IF = 1.15), 2022.

### Domestic Conference

1. **"Efficient Multi-Scale Feature Generation Network."**
   Gwanghan Lee, Saebyeol Shin, and Simon S. Woo.
   Korea Computer Congress (KCC), 2022.

2. **"Gradual Group-level Pruning with Dynamic Sparse Training"**
   Gwanghan Lee, and Dongkun Shin.
   Korea Computer Congress (KCC), 2020.

* Equal contributions

## WORK EXPERIENCE

**Upstage** **Online, Korea**

*AI Research Intern* *05/2023 – Current*

- Developing an End-to-End Object Detection with Transformers (DETR) for OCR.

**SK Telecom** **Pangyo, Korea**

*AI Fellowship Intern* *06/2022 – 10/2022*

- Won an order for the 3rd year project to restore the old image from the Jeollanam-do Provincial Office supervised by the Ministry of Culture, Sports and Tourism.
- Published 1 conference paper and 1 patent during the project.

## PROJECT EXPERIENCE

**Restoring grayscale images of Korean War Veterans using AI Technology** **MPVA**

*Development on Image Colorization (MOU project)* *02/2023 – 03/2023*

- Developing AI technology for restoring historical images.

**Development of grayscale image colorization technology using deep learning** **SK Telecom**

*Research on Image Colorization* *06/2022 – 10/2022*

- Developed user-interactive, context/instance adaptive colorization model to colorize and restore grayscale images of historically significant events in Korea such as independence movements, Korean War, and democratization protests.

**Object Detection in Satellite Images** **Hanwha System / ICT**

*Industry-Academic Cooperation Researcher* *05/2022 – 11/2022*

- Contributed to the development of a rotated object detection network on satellite datasets.

**Solving Mathematical Problems using NLP Technology** **IITP**

*Research on model compression* *07/2021 – 05/2022*

- Constructed efficient deep learning models to solve mathematical problems that understands the context of natural language with improved inference speed compared to existing deep learning models.

**Development of Deepfake detection technology** **SKKU**

*Development on Deepfake Detection* *03/2021 – 12/2021*

- Contributed to the development of deepfake detection models.

**Software Framework for Intelligent IoT Devices** **IITP**

*Research on model compression* *03/2020 – 01/2021*

- Contributed to the development of efficient network. (pruning, knowledge distillation, optimization)

## AWARDS AND HONORS

**International Awards** (Kaggle Competition Master)

- **Gold medal (9th/828), Sound Classification,** BirdCLEF 2022 Kaggle, *2022*
- **Silver medal (21st/1565), Image Segmentation,** UW-Madison GI Tract Image Segmentation Kaggle, *2022*
- **Silver medal (41st/874), Image Captioning,** Bristol-Myers Squibb – Molecular Translation Kaggle, *2021*
- **Bronze medal (137th/1636), Regression,** COVID-19 mRNA Vaccine Degradation Prediction Kaggle, *2020*
- **Bronze medal (243th/2618), Classification,** University of Liverpool - Ion Switching Kaggle, *2020*
- **Bronze medal (113th/1538), Object Detection,** Understanding Clouds from Satellite Images Kaggle, *2019*

**Domestic Awards**

- **2nd Place, Image Colorization**, SKT AI Fellowship SKT, *2022*

- **1st Place, Super Resolution,** Camera Image Quality Improvement AI Competition — LG AI Research, *2021*
- **1st Place, Object Detection,** SKT CCTV Security Video Image Object Detection — SKT, *2021*
- **1st Place, Video Classification,** 2021 Pangyo AI Challenge — AICONNECT, *2021*
- **1st Place, Topic Classification,** News topic classification using KLUE data — DACON, *2021*
- **2nd Place, Anomaly Detection,** Electrical energy quality classification AI Contest — NIPA, *2021*
- **2nd Place, Image Classification,** Ego-Vision Hand Gesture Recognition AI Competition — NIA/DACON, *2021*
- **Awards (KRW 273M in support),** 2021 AI Grand Challenge 5th — IITP, *2021*
- **3rd Place, Regression,** Collider detection AI contest using vibration data — KAERI/DACON, *2020*
- **2nd Place, Regression,** Bio-Optical Data Analysis AI Contest — AI i-CON/DACON, *2020*
- **3rd Place, Regression**, AI Challenge for temperature estimation using public data — KIMM/DACON, *2020*
- **2nd Place, Regression,** Jeju BigData Competition — JTP/DACON, *2019*
- **3rd Place (leaderboard 5th), Recommender System,** Kakao brunch article recommendation — KAKAO, *2019*

### Scholarships

- SKKU Best Paper Scholarship — *2022*
- SKKU Academic Excellence Scholarship — 2022
- SKKU Best Paper Scholarship — *2021*
- SKKU Academic Excellence Scholarship — 2021

## TEACHING EXPERIENCE

**Undergraduate Research Program** — **Seoul, Korea**

*Deeplearning Project Mentort* — *03/2021 – 12/2021*

- Lecture on the entire pipeline from image pre-processing, modeling, and post-processing.
- A Guide to Deepfake Detection Research.
- A Guide to Efficient Deepfake Detection Research.

## PROFICIENCY IN SKILLS

**Programming/Framework:** Python, Pytorch, LaTeX (all advanced)
**Languages:** Korean (native fluency), English (TOEIC Speaking 150)