Min Jung Lee

Position

Master's Student
Graduate School of Artificial Intelligence
Pohang University of Science and Technology (POSTECH)

Contact Information

Computer Vision Laboratory
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Research Interests

My research interests mainly focus on developing novel models and algorithms to address practical challenges in deploying artificial intelligence systems to various real-world applications. I am currently focused on the following topics:

- **LLM-based video understanding:** video summarization, multi-modal LLMs, video captioning, action segmentation, contextual understanding.
- **Computational photography:** burst enhancement, image restoration/enhancement, super-resolution, camera ISP, inverse camera ISP, HDR merging.

The application domains of interest encompass a broad range, including multi-modal learning (e.g., Vision-language, Visual QA, and image captioning) and LLM (e.g., fine-tuning LLM and prompt engineering).

Education

Pohang University of Science and Technology (POSTECH), Pohang, Korea

M.S., Graduate School of Artificial Intelligence (GSAI) **Sep 2022 – Aug 2024**

- Advisor: Prof. Minsu Cho
- Cumulative GPA: 4.05/4.3 (97.5 / 100)
- Thesis: "Video Summarization with Large Language Models"

San Francisco State University (SFSU), California, U.S.

Exchange Student **Jan 2020 – May 2020**

- Cumulative GPA: 4.0/4.0

Chung-Ang University (CAU), Seoul, Korea

B.S., School of Electrical and Electronics Engineering (EEE) **Mar 2017 – Feb 2022**

- Advisor: Prof. Chang Ha Lee
- Honors: *Summa Cum Laude*
- Cumulative GPA: 4.31/4.5 (98.10 / 100, Rank: 11 / 201)

Publications

Min Jung Lee, Dayoung Gong, Minsu Cho, "Video Summarization with Large Language Models," *On-going*

Jungwoo Kim, **Min Jung Lee**, Suha Kwak, "Fine-Tuning Strategies for Weather Condition Shifts: A Comparative Analysis of Models Trained on Synthetic and Real Datasets," in *Annual Symposium of Korea Information Processing Society* **(ASK)**, 2024.

Sanghyun Kim*, **Min Jung Lee***, Woohyeok Kim, Deunsol Jung, Jaesung Rim, Sunghyun Cho, Minsu Cho, "Burst Image Super-Resolution with Base Frame Selection," in *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition* **(CVPR)** *workshop, NTIRE*, 2024.

Min Jung Lee, Jongmin Lee, Sanghyun Kim, Sunghyun Cho, Minsu Cho, "Base Frame Selection on Dynamically Exposed Burst," in *Image Processing and Image Understanding* **(IPIU)** 2024.

Min Jung Lee, Chi-hyoung Rhee, Chang Ha Lee, "HSVNet: Reconstructing HDR Image from a Single Exposure LDR Image with CNN," in ***Applied Sciences****, vol. 12, no. 5, p.*

2370, Feb. 2022, doi: 10.3390/app12052370..

Research Projects

Samsung Advanced Institute of Technology (SAIT) Nov 2022 - Oct 2023
Non-uniformly exposed burst processing using robust base frame selector. (ISP Project)

Samsung Advanced Institute of Technology (SAIT) Sep 2022 - Oct 2022
Burst image enhancement in an extremely degraded environment by noise, blur and shift. (ISP Project)

Research Experience

Computer Vision lab. @ POSTECH Sep 2022 - present

- **Develop a video summarization framework with multi-modal LLMs** by leveraging output embedding from the LLMs, and applying self-attention mechanisms to produce contextually rich output summaries. (NeurIPS'24 submission)
- **Develop a frame selection model** to improve the quality of burst image restoration/enhancement by merging image features and motion information (CVPRW'24, IPIU'24)
- **Create synthetic RAW burst dataset** under capturing non-uniform exposure from public video benchmark using inverse camera ISP
- **Collect Real-world RAW burst dataset** under capturing non-uniform exposure using dual-camera system for evaluation

Visualization lab. @ CAU Jan 2021 - Feb 2022

- **Develop an HDR reconstruction network** from a single random exposure LDR image with U-net for image enhancement

Professional Activities

Teaching assistant
AI Trends (AIGS703C-01) @ POSTECH Fall semester 2023

Instructor
POSCO AI expert training course @ POSTECH June 2023 – July 2023

Engineering Experience

Term projects

- Deep Learning (AIGS538): Spring semester 2023
  Convolutional block attention module with regularization [pdf]
- Computer Vision (AIGS539): Fall semester 2022
  Fine-tuning strategies for semantic segmentation models [pdf]

Side projects

- An algorithm replacing the authentic fingerprints in images with the fake fingerprints using edge connect for biometrics security [pdf] June 2021 – Aug 2021
- A mobile application on Google Play Store "Food Timer" suggesting the ideal time for cooking depending on the kind of food to users Sep 2019 – Nov 2019
- A mobile application and built an Arduino circuit system for booking seat system for the pregnant in public transportation [pdf] Aug 2019 – Sep 2019

Honors and Awards

Dean's List with Department Honor Scholarship

- Top 1 in a department Spring 2021
- Top 10% in a department Spring 2019, Fall 2018, Spring 2018

Community Services

Student Worker @ SFSU Jan 2020 – May 2020

- Affiliated to IEEC (International Education Exchange Council)
- Promoted information sessions and social events among international students.

Language

Korean(native), English(fluent)

Skills

Programming Languages: Python
S/W Packages: PyTorch