

# Hyeongmin Lucas Lee

ML Research Scientist (Ph.D.) at Twelve Labs, Seoul, Korea

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🎓 <https://scholar.google.co.kr/citations?user=eEB3K6gAAAAJ>

📺 <https://www.youtube.com/@lucas-lee>

🔄 <https://github.com/HyeongminLEE>

🌐 <https://hyeongminlee.github.io>

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## Research Interest

- Machine Learning & Computer Vision
- Video Processing & Enhancement
- Video Understanding & Representation Learning
- Image & Video Compression
- Image & Video Generation
- Video Frame Interpolation

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## Education

Mar.2018 – Aug.2023 **INTEGRATED M.S./PH.D. Course in Electrical and Electronic Engineering**

*Yonsei University, Seoul, Korea*

- Image and Video Pattern Recognition LAB
- Supervised by Prof. Sangyoun Lee
- GPA: 4.24/4.3

Mar.2014 – Feb.2018 **B.S. in Electrical and Electronic Engineering**

*Yonsei University, Seoul, Korea*

- Graduated **Cum Laude**
- GPA: 3.96/4.3

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## Work Experience

July.2023 - Present **Twelve Labs**, Seoul, Korea

*ML Research Scientist*

- Working on the Foundation Models for Video Understanding

May.2021 - Nov.2021 **Adobe Research**, San Jose, CA (Remote)

*Research Intern*

- Working with Dr. Simon Niklaus and Dr. Oliver Wang
- Research on Video Stabilization

## Publications

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- 2023 [1] **Hyeongmin Lee**, Taeoh Kim, Hanbin Son, Sangwook Baek, Minsu Cheon, and Sangyoun Lee, “A Nonlinear, Regularized, and Data-Independent Modulation for Continuously Interactive Image Processing Network,” *International Journal of Computer Vision (IJCV)*, 2023.
- [2] Sangjin Lee\*, **Hyeongmin Lee\***, Chajin Shin, and Sangyoun Lee, “Exploring Discontinuity for Video Frame Interpolation,” *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) (Highlight; Top 10% of Accepted Papers)*, 2023.
- 2022 [3] Chajin Shin, **Hyeongmin Lee**, Hanbin Son, Sangjin Lee, Dogyoon Lee, and Sangyoun Lee, “Expanded Adaptive Scaling Normalization for End to End Image Compression,” *European Conference on Computer Vision (ECCV)*, 2022.
- [4] Hanbin Son, Taeoh Kim, **Hyeongmin Lee**, and Sangyoun Lee, “Enhanced Standard Compatible Image Compression Framework based on Auxiliary Codec Networks,” *IEEE Transactions on Image Processing (TIP)*, 2022.
- 2021 [5] Dogyoon Lee, Jaeha Lee, Junhyeop Lee, **Hyeongmin Lee**, Minhyeok Lee, Sungmin Woo, and Sangyoun Lee, “Regularization Strategy for Point Cloud via Rigidly Mixed Sample,” *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2021.
- 2020 [6] Taeoh Kim\*, **Hyeongmin Lee\***, MyeongAh Cho\*, Hoseong Lee, Dong heon Cho, and Sangyoun Lee, “Learning Temporally Invariant and Localizable Features via Data Augmentation for Video Recognition,” *European Conference on Computer Vision Workshops (ECCVW) (Oral)*, 2020.
- [7] **Hyeongmin Lee**, Taeoh Kim, Tae-young Chung, Daehyun Pak, Yuseok Ban, and Sangyoun Lee, “AdaCoF: Adaptive Collaboration of Flows for Video Frame Interpolation,” *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2020.
- [8] Sangjin Lee, **Hyeongmin Lee**, Taeoh Kim, and Sangyoun Lee, “Extrapolative-Interpolative Cycle-Consistency Learning for Video Frame Extrapolation,” *IEEE International Conference on Image Processing (ICIP)*, 2020.
- 2019 [9] MyeongAh Cho, Tae-young Chung, **Hyeongmin Lee**, and Sangyoun Lee, “N-RPN : Hard Example Learning for Region Proposal Networks,” *IEEE International Conference on Image Processing (ICIP)*, 2019.
- [10] Taeoh Kim, **Hyeongmin Lee**, Hanbin Son, and Sangyoun Lee, “SF-CNN : A Fast Compression Artifacts Removal via Spatial-to-Frequency Convolutional Neural Networks,” *IEEE International Conference on Image Processing (ICIP)*, 2019.
- 2018 [11] **Hyeongmin Lee**, Taeoh Kim, Eungyeol Song, and Sangyoun Lee, “CollaboNet: Collaboration of Generative Models by Unsupervised Classification,” *IEEE International Conference on Image Processing (ICIP)*, 2018.
- [12] Eungyeol Song, **Hyeongmin Lee**, Jaesung Choi, and Sangyoun Lee, “AHD: Thermal Image-based Adaptive Hand Detection for Enhanced Tracking System,” *IEEE Access*, 2018.

\* indicates equal contribution. Click the titles to move to the paper links

## Patents

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- 2021 **Apparatus for compressing image, learning apparatus and method thereof**  
*Korea Patent no.10-2245682, Apr. 2021*
- 2021 **Apparatus and method for interpolating frames based on multiple flows**  
*Korea Patent no.10-2201297, Jan. 2021*

## Projects

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- Jul.2022 – Jun.2023    **Development of Enhanced Deep Video Compression Framework**  
*Samsung Research*
- Jun.2021 – May.2022    **Development of Deep Learning-based Video Frame Interpolation Algorithm for Game and AR Videos**  
*Samsung Electronics Mobile Division*
- Jun.2021 – May.2022    **Deep Learning-based E2E Video Codec Research**  
*Samsung Research*
- May.2021 – Nov.2021    **Fast Video Stabilization**  
*Adobe Research*
- Apr.2020 – Dec.2020    **Development of Data Augmentation-based AI Algorithm for Image Enhancement**  
*Samsung Research*
- May.2019 – Dec.2019    **Locally Controllable Deep Neural Network Algorithm Development**  
*Samsung Research*
- Apr.2018 – Dec.2018    **Development of Compact Deep Networks for Image Processing**  
*Samsung Research*
- Apr.2017 – Dec.2017    **Broadcasting Device Controlling & Editing Technology using Personal Voice/Gesture Recognition**  
*Institute for Information & Communications Technology Promotion (IITP), Ministry of Science*

## Honors & Awards

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- 2021    **5th Next Generation Engineering Leader Award of NAEK**  
*National Academy of Engineering of Korea (NAEK)*
- 2020    **Visual Inductive Priors for Data-Efficient Action Recognition Challenge**  
*1st Visual Inductive Priors for Data-Efficient Deep Learning Workshop*
- European Conference on Computer Vision (ECCV) Workshop
  - **4th Place**
- 2018    **Honor Graduation Award**  
*Electrical & Electronic Engineering, Yonsei University*
- Cum Laude
- 2014 - 2017    **Honor Student Award**  
*Electrical & Electronic Engineering, Yonsei University*
- The Highest Honor Student Award (2014-1)
  - Honor Student Award (2014-2, 2015-1, 2015-2, 2017-1, 2017-2)

## Invited Talks

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- **AdaCoF: Adaptive Collaboration of Flows for Video Frame Interpolation**
  - GPU Technology Conference (GTC), NVIDIA, Oct.2020
- **Introduction to Image Translation**
  - Junior Seminar, Electrical & Electronic Engineering, Yonsei University, Nov.2020

## Peer Reviews

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- IEEE Open Journal of Signal Processing (2021)
- IEEE/CVF Conference on Computer Vision and Pattern Recognition (2022)
- European Conference on Computer Vision (2022)
- IEEE/CVF Conference on Computer Vision and Pattern Recognition (2023)

## Activities

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Oct.2019 - Present    **Member of PR12**

*Deep Learning paper reading group in Tensorflow KR (In Korean)*

- Season 3 (Oct.2019-Jan.2021)
- Season 4 (Mar.2021-Aug.2022)
- Season 5 (Sep.2022-Present)

Mar.2019 - Nov.2021    **SNU AI Study**

*Offline AI Study Group at Seoul National University*

- Season 6 (Mar.2019-Jul.2019)
- Season 7 (Feb.2020-May.2020)
- Season 8 (Organizer) (Sep.2020-Dec.2020)
- Season 9 (Organizer) (Jan.2021-Apr.2021)
- Season 10 (Organizer) (Aug.2021-Nov.2021)

Mar.2018 – Dec.2018    **Teaching Assistant**

*Electrical and Electronic Engineering, Yonsei University*

- (2018-1) Digital Signal Processing
- (2018-2) Signal and System

Dec.2019 – Dec.2020    **Young Engineers' Honor Society (YEHS)**

*Organization under The National Academy of Engineering of Korea (NAEK)*

- Deputy Department Head of Academic Exchange Dpt. (Dec.2017 – Dec.2018)
- Department Head of Academic Exchange Dpt. (Dec.2018 – Dec.2019)
- President (Dec.2019 – Dec.2020)

Last Updated: March, 2023