Jongmin Lee

Position

Ph.D Candidate
Department of Computer Science and Engineering
Pohang University of Science and Technology (POSTECH)

Contact Information

Computer Vision Laboratory, E2 302, Dept. of CSE, POSTECH
77 Cheongam Rd, Nam-gu,
Pohang, Gyeongbuk, 37673,
Republic of Korea
Phone: (+82) 54 279 2931
Mobile: (+82) 10 8242 3070
e-mail: ljm1121@postech.ac.kr Homepage: blog, google scholar, github

Citizenship

The Republic of Korea

Birthday

November 21th, 1994.

Research Interests

Computer vision and deep learning.
Specific research interests include: **image matching**, **deep local feature extraction**, semantic correspondence, self-supervised learning, equivariant representation learning, geometric deep learning, extremely low-light image enhancement, and burst image enhancement/restoration.

Education

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

Ph.D Student, Dep. of Computer Science and Engineering (CSE) **Sep 2018 – now**

- Advisor: Prof. Minsu Cho

Graz University of Technology (TU Graz), Graz, Austria

Visiting Student **Sep 2016 – Feb 2017**

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

B.S., Dep. of Industrial and Management Engineering (IME)
B.S., Dep. of Computer Science and Engineering (CSE) **Mar 2013 – Aug 2018**

- Double Major

Industry Experience

Meta Reality Labs., Burlingame, California, U.S.A.
Ph.D Research Scientist Intern **Jul 2023 – Oct 2023**

- Learning-based analytics research on human behavior for AR/VR device. (XR Eyes)
- Improved gaze estimation accuracy in Meta Quest production model using a single POR camera through invariant feature learning for a personalized, explainable ML Eyes model
- Increased KPIs (P95, PCD<4.5) of ET production model by 9% of Arcata project

Fast campus., Seoul, South Korea
Computer Vision Lecturer **Mar 2022 – Aug 2022**

- Lecturing on computer vision from classical to state-of-the-art deep learning approaches.
- Curriculum Sheet: Google Spreadsheet

Vuno Inc., Seoul, South Korea
Front-end Developer **Jun 2017 – Aug 2017**

- Developed the client/front-end interface for an AI-based software for diagnosis of major abnormalities from a chest X-ray.

International Publications

Jongmin Lee, Min Jung Lee, Sanghyun Kim, Woohyeok Kim, Jaesung Rim, Sunghyun Cho, Minsu Cho, "Burst Image Enhancement with Non-Uniform Exposures," *Under review.*

Jongmin Lee, Sanghyun Kim, Min Jung Lee, Minsu Cho, "Multiply Degraded Burst Image Enhancement via Robust Base Frame Selection," *Under review.*

Jongmin Lee, Byungjin Kim, Seungwook Kim, Minsu Cho, "Learning Rotation-Equivariant Features for Visual Correspondence," in *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition* **(CVPR)**, 2023.

Jongmin Lee, Byungjin Kim, Minsu Cho, "Self-Supervised Equivariant Learning for Oriented Keypoint Detection," in *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition* **(CVPR)**, 2022.

Jongmin Lee, Yoonwoo Jeong, Minsu Cho, "Self-supervised Learning of Image Scale and Orientation Estimation," in *Proceedings of the 32nd British Machine Vision Conference* **(BMVC)**, 2021.

Jongmin Lee, Yoonwoo Jeong, Seungwook Kim, Juhong Min, Minsu Cho, "Learning to Distill Convolutional Features Into Compact Local Descriptors," in *Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision* **(WACV)**, 2021.

Juhong Min, **Jongmin Lee**, Jean Ponce, Minsu Cho, "Learning to Compose Hypercolumns for Semantic Visual Correspondence," in *Proceedings of the European Conference on Computer Vision* **(ECCV)**, 2020.

Juhong Min, **Jongmin Lee**, Jean Ponce, Minsu Cho, "SPair-71k: A Large-scale Benchmark for Semantic Correspondence," arXiv preprint, 2019.

Juhong Min, **Jongmin Lee**, Jean Ponce, Minsu Cho, "Hyperpixel Flow: Semantic Correspondence with Multi-layer Neural Features," in *Proceedings of the IEEE/CVF International Conference on Computer Vision* **(ICCV)**, 2019.

Paul Hongsuck Seo, **Jongmin Lee**, Deunsol Jung, Bohyung Han, Minsu Cho, "Attentive Semantic Alignment with Offset-Aware Correlation Kernels," in *Proceedings of the European Conference on Computer Vision* **(ECCV)**, 2018.

Research Projects

Kakao Brain Nov. 2021 - Jul. 2023
Efficient equivariant representation learning in deep neural networks.

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

Samsung Advanced Institute of Technology (SAIT) Nov. 2021 - Oct. 2022
Burst image enhancement in an extremely degraded environment by noise, blur and shift. (ISP Project)

Samsung Advanced Institute of Technology (SAIT) Nov. 2020 - Oct. 2021
Motion-aware burst image enhancement under extremely low-light conditions. (ISP Project)

Professional Activities

Reviewer of international conferences

International Conference on Learning Representations (ICLR) 2024
Neural Information Processing Systems (NeurIPS) 2023
International Conference on Computer Vision (ICCV) 2023
International Conference on 3D Vision (3DV) 2022
European Conference on Computer Vision (ECCV) 2022
IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) 2022, 2023
British Machine Vision Conference (BMVC) 2021
Winter Conference on Applications of Computer Vision (WACV) 2021, 2022, 2023, 2024
International Conference on Machine Vision Applications (MVA) 2021, 2023
International Conference on Pattern Recognition (ICPR) 2020

Reviewer of international journals

IEEE Transactions on Pattern Analysis and Machine Intelligence (2023)
International Journal of Computer Vision (2023)
IEEE Transactions on Image Processing (2022, 2023)
Pattern Recognition (2022, 2023)
The Visual Computer (2022)

Teaching Assistant

Artificial Intelligence & Data Science (CSED537) @ POSTECH	Spring semester 2023
Introduction to Deep Learning (CSED490W) @ POSTECH	Fall semester 2019
POSCO AI expert training course	July 2019 – Aug 2019
Automata & Formal Languages (CSED341) @ POSTECH	Fall semester 2018

Honours and Awards

BK21 outstanding paper award, POSTECH CSE, 2022.

Global Ph.D fellowship, *National Research Foundation of Korea (NRF)*, 2019 – Now.

Excellent research award, Undergraduate Research Program, *POSTECH Computer Science Engineering Dep.*, 2018.

SK Hynix scholarship, SK Hynix Fellowship Program, *POSTECH*, 2015.

Invited Talks

"Hyperpixel Flow: Semantic Correspondence with Multi-layer Neural Features", *ICCV 2019 Paper Day with Naver*, Hotel Andaz Gangnam, Seoul, Korea, October 2019.

"Where is semantic correspondence? - The general image matching problem in deep learning era", *Hyundai Motors AIR Lab(Artificial Intelligence Research Lab) seminar*, Pohang, Korea, September 2019.

"Semantic Alignment - Find Semantic Dense Correspondence," *Naver corp.*, Pangyo, Korea, October 2018. Youtube link (Korean)

Language Skills

Korean(native), English(fluent)

Referees

Available on request.