

Junghyup Lee

Ph.D Student

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EDUCATION

- **Yonsei University, Seoul, Korea** Mar. 2018 - Aug. 2024 (Expected)
School of Electrical and Electronic Engineering, Joint course of M.S./Ph.D GPA: 4.25/4.3
Supervisor: Bumsub Ham
- **Yonsei University, Seoul, Korea** Mar. 2012 - Feb. 2018
School of Electrical and Electronic Engineering, B.S. GPA: 4.13/4.3 (Major), 3.92/4.3 (Overall)

RESEARCH INTERESTS

Efficient Machine Learning: Network Architecture Search, Network Quantization, Knowledge Distillation

Computer Vision: Image Matching, Super Resolution

TECHNICAL SKILLS

Languages: Korean, English

Programming: Python, PyTorch, MATLAB, C/C++, CUDA

PUBLICATIONS (FIRST AUTHOR)

- **AZ-NAS: Assembling Zero-Cost Proxies for Network Architecture Search** Jun. 2024
Junghyup Lee and Bumsub Ham.
in *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*
- **Learning Semantic Correspondence Exploiting an Object-level Prior** Mar. 2022
Junghyup Lee*, Dohyung Kim*, Wonkyung Lee, and Bumsub Ham (*equal contribution).
IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), vol. 44, no. 3, pp. 1399-1414
- **Network Quantization with Element-wise Gradient Scaling** Jun. 2021
Junghyup Lee, Dohyung Kim, and Bumsub Ham.
in *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*
- **Learning with Privileged Information for Efficient Image Super-Resolution** Aug. 2020
Junghyup Lee*, Wonkyung Lee*, Dohyung Kim*, and Bumsub Ham (*equal contribution).
in *European Conference on Computer Vision (ECCV)*
- **SFNet: Learning Object-aware Semantic Correspondence** Jun. 2019
Junghyup Lee*, Dohyung Kim*, and Bumsub Ham (*equal contribution).
in *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)* (**Oral Presentation**)

PUBLICATIONS (CO-AUTHOR)

- **PLoPS: Localization-Aware Person Search with Prototypical Normalization** Apr. 2024
Sanghoon Lee, Youngmin Oh, Donghyeon Baek, Junghyup Lee, and Bumsub Ham.
Pattern Recognition (Accepted)
- **RankMixup: Ranking-Based Mixup Training for Network Calibration** Oct. 2023
Jongyoun Noh, Hyekang Park, Junghyup Lee, and Bumsub Ham.
in *International Conference on Computer Vision (ICCV)*
- **Decomposed Knowledge Distillation for Class-Incremental Semantic Segmentation** Nov. 2022
Donghyeon Baek, Youngmin Oh, Sanghoon Lee, Junghyup Lee, and Bumsub Ham.
in *Neural Information Processing Systems (NeurIPS)*

- **SIF-NPU: A 28nm 3.48 TOPS/W 0.25 TOPS/mm² CNN Accelerator with Spatially Independent Fusion for Real-Time UHD Super-Resolution** *Sep. 2022*
Sumin Lee, Ki-Beom Lee, Sunghwan Joo, Hong Keun Ahn, **Junghyup Lee**, Dohyung Kim, Bumsub Ham, and Seong-Ook Jung
in IEEE European Solid State Circuits Conference (ESSCIRC)
- **OIMNet++: Prototypical Normalization and Localization-aware Learning for Person Search** *Oct. 2022*
Sanghoon Lee, Youngmin Oh, Donghyeon Baek, **Junghyup Lee**, and Bumsub Ham.
in European Conference on Computer Vision (ECCV)
- **Learning by Aligning: Visible-Infrared Person Re-identification using Cross-Modal Correspondences** *Oct. 2021*
Hyunjong Park*, Sanghoon Lee*, **Junghyup Lee**, and Bumsub Ham (*equal contribution).
in International Conference on Computer Vision (ICCV)
- **Video-based Person Re-identification with Spatial and Temporal Memory Networks** *Oct. 2021*
Chanho Eom, Geon Lee, **Junghyup Lee**, and Bumsub Ham.
in International Conference on Computer Vision (ICCV)
- **Distance-aware Quantization** *Oct. 2021*
Dohyung Kim, **Junghyup Lee**, and Bumsub Ham.
in International Conference on Computer Vision (ICCV)

AWARDS

- **Silver Prize (First Author)** *Feb. 2022*
28th Samsung Humantech Paper Award
- **Gold Prize (First Author)** *Feb. 2021*
27th Samsung Humantech Paper Award
- **Excellence Award (First Author)** *Dec. 2020*
Graduate Student Paper Contest in Yonsei University
- **Silver Prize (First Author)** *Feb. 2019*
25th Samsung Humantech Paper Award

SCHOLARSHIP

- **Global Ph.D Fellowship** *Mar. 2019 - Feb. 2024*
National Research Foundation of Korea (NRF)

SELECTED PROJECTS

- **Development of Fundamental Technology and Integrated Solution for Next-Generation Automatic Artificial Intelligence System** *Apr. 2022 - Present*
Supported by the SW StarLab project of IITP
 - Develop a network architecture search algorithm
 - Develop a network quantization algorithm
 - Implement the algorithms using PyTorch
 - Outcomes: 1 conference paper, 1 journal paper (under review), 1 patent (application)
- **N²OC: Neural-Networks-on-Chip for Real Time Super-Resolution** *Dec. 2018 - Nov. 2021*
Supported by Samsung Science & Technology Foundation
 - Develop an efficient super-resolution algorithm
 - Develop network quantization methods for hardware implementation
 - Implement the algorithms using PyTorch and release them as open-source projects
 - HW/SW co-optimization for designing a super-resolution chip
 - Outcomes: 4 conference papers, 2 patents (registration), 1 patent (application)

- **Dense Semantic Correspondence Based on Deep Learning:
From Supervised Learning to Unsupervised Learning**

Mar. 2018 - Feb. 2020

Supported by National Research Foundation (NRF) of Korea

- Develop a semantic correspondence (pixel-level image matching) algorithm
- Implement the algorithm using PyTorch and release it as an open-source project
- Outcomes: 1 conference paper, 1 journal paper, 1 patent (registration)

PATENTS

- **Quantization Apparatus and Method for Artificial Neural Network** *Sep. 2023*
10-2023-0116857, KR (Application)
- **Image Upscaling Apparatus and Method Based on Learning with Privileged Information** *Jun. 2023*
10-2543690, KR (Registration)
- **Quantization-Aware Training Apparatus and Method** *Apr. 2023*
10-2023-0049837, KR (Application)
- **Apparatus and Method for Class Incremental Semantic Segmentation Learning based on Decomposed Knowledge Distillation** *Dec. 2022*
10-2022-0185609, KR (Application)
- **Quantizer for Artificial Neural Networks and Loss Backpropagation Method Thereof** *Jun. 2022*
10-2409476, KR (Registration)
- **Apparatus and Method for Person Re-Identification based on Video with Spatial and Temporal Memory Networks** *Dec. 2021*
10-2021-0179580, KR (Application)
- **Quantizer and Quantization Method for Artificial Neural Network** *Oct. 2020*
10-2020-0135673, KR (Application)
- **Semantic Matching Apparatus and Method** *Oct. 2020*
10-2166117, KR (Registration)

EXPERIENCE

- **Reviewer**
 - IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI).
 - IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2020, 2021, 2022, 2023, 2024.
 - Neural Information Processing Systems (NeurIPS), 2020, 2021, 2022.
 - International Conference on Computer Vision (ICCV), 2019, 2021.
 - European Conference on Computer Vision (ECCV), 2020.
 - AAAI Conference on Artificial Intelligence (AAAI), 2023.
- **Presentations & Invited Talks**
 - Invited Talk (Network Quantization)
 - *Naver Labs Seminar* *Jun. 2022*
 - Poster Presentation (Network Quantization with Element-wise Gradient Scaling)
 - *Naver AI Author Meetup - Computer Vision* *Sep. 2021*
 - *Korean Conference on Computer Vision (KCCV)* *Aug. 2021*
 - Poster Presentation (Video Pose Propagation using Semantic Correspondence)
 - *32nd Workshop on Image Processing and Image Understanding (IPIU)* *Jan. 2020*
 - Poster Presentation (SFNet: Learning Object-aware Semantic Correspondence)
 - *Samsung AI Forum (SAIF)* *Nov. 2019*
 - *Workshop on Frontiers of Electrical Engineering (FREE) in Yonsei University* *Oct. 2019*
 - *Korean Conference on Computer Vision (KCCV)* *Jul. 2019*