

Sanghyun Son

Contact Information

Affiliation: Samsung Electronics
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Github: <https://github.com/sanghyun-son>
Homepage: <https://sanghyun-son.github.io>
Google scholar: [link](#)

Work Experience

Staff Engineer Sep. 2023 – Present
Computer Vision TU, AI Research Center, SAIT, Samsung Electronics
Developing AI-based ISP solution

Education

Ph.D. in Department of ECE Mar. 2017 – Aug. 2023
Integrated Ph.D. program in Seoul National University (SNU), Seoul, Korea
Thesis: Generalized Resampling Model for Practical Image Super-Resolution
Advisor: Kyoung Mu Lee

B.S. in Department of ECE - *summa cum laude* Mar. 2013 – Feb. 2017
Seoul National University (SNU), Seoul, Korea

International Publications

- Reyhaneh Neshatavar*, Mohsen Yavartanoo*, **Sanghyun Son**, and Kyoung Mu Lee, “ICF-SRSR: Invertible scale-Conditional Function for Self-Supervised Real-world Single Image Super-Resolution,” In **WACV**, 2024.
- Joonkyu Park, **Sanghyun Son**, and Kyoung Mu Lee, “Content-Aware Local GAN for Photo-Realistic Super-Resolution,” In **ICCV**, 2023.
- Wooseok Lee, **Sanghyun Son**, and Kyoung Mu Lee, “AP-BSN: Self-Supervised Denoising for Real-World Images via Asymmetric PD and Blind-Spot Network,” In **CVPR**, 2022.
- Reyhaneh Neshatavar, Mohsen Yavartanoo, **Sanghyun Son**, and Kyoung Mu Lee, “CVF-SID: Cyclic Multi-Variate Function for Self-Supervised Image Denoising by Disentangling Noise from Image,” In **CVPR**, 2022.
- Seungjun Nah, **Sanghyun Son**, Jaerin Lee, and Kyoung Mu Lee, “Clean Images are Hard to Reblur: Exploiting the Ill-Posed Inverse Task for Dynamic Scene Deblurring,” In **ICLR**, 2022.
- Geonwoon Jang, Wooseok Lee, **Sanghyun Son**, and Kyoung Mu Lee, “C2N: Practical Generative Noise Modeling for Real-World Denoising,” In **ICCV**, 2021.
- **Sanghyun Son** and Kyoung Mu Lee, “SRWarp: Generalized Image Super-Resolution under Arbitrary Transformation,” In **CVPR**, 2021.

- **Sanghyun Son***, Jaeha Kim*, Wei-Sheng Lai, Ming-Hsuan Yang, and Kyoung Mu Lee, “Toward Real-World Super-Resolution via Adaptive Downsampling Models,” *IEEE Trans. on Pattern Analysis and Machine Intelligence (TPAMI)*, vol. 44, no. 11, pp. 8567-8670, 2022.
<https://doi.org/10.1109/TPAMI.2021.3106790>
- **Sanghyun Son** and Kyoung Mu Lee, “Image Super-Resolution,” in Ikeuchi K. (eds) *Computer Vision*. Springer, Cham, 2021. https://doi.org/10.1007/978-3-030-03243-2_838-1
- Seungjun Nah, **Sanghyun Son**, and Kyoung Mu Lee, “Recurrent Neural Networks with Intra-Frame Iterations for Video Deblurring,” In **CVPR**, 2019.
- **Sanghyun Son**, Seungjun Nah, and Kyoung Mu Lee, “Clustering Convolutional Kernels to Compress Deep Neural Networks,” In **ECCV**, 2018.
- Bee Lim, **Sanghyun Son**, Heewon Kim, Seungjun Nah, and Kyoung Mu Lee, “Enhanced Deep Residual Networks for Single Image Super-Resolution,” **NTIRE 2017** workshop in conjunction with **CVPR**, 2017. (**Challenge winners, Workshop best paper, Over 5,000 citations on Google Scholar, over 2,300 Github stars**)

International Challenges and Reports

- **Sanghyun Son**, Suyoung Lee, Seungjun Nah, Radu Timofte, and Kyoung Mu Lee, “NTIRE 2021 Challenge on Video Super-Resolution,” **NTIRE 2021** workshop in conjunction with **CVPR**, 2021.
- Seungjun Nah, **Sanghyun Son**, Suyoung Lee, Radu Timofte, and Kyoung Mu Lee, “NTIRE 2021 Challenge on Image Deblurring,” **NTIRE 2021** workshop in conjunction with **CVPR**, 2021.
- **Sanghyun Son**, Jaerin Lee, Seungjun Nah, Radu Timofte, and Kyoung Mu Lee, “AIM 2020 Challenge on Video Temporal Super-Resolution,” **AIM 2020** workshop in conjunction with **ICCV**, 2020.
- Seungjun Nah, **Sanghyun Son**, Radu Timofte, and Kyoung Mu Lee, “NTIRE 2020 Challenge on Image and Video Deblurring,” **NTIRE 2020** workshop in conjunction with **CVPR**, 2020.
- Seungjun Nah, **Sanghyun Son**, Radu Timofte, and Kyoung Mu Lee, “AIM 2019 Challenge on Video Temporal Super-Resolution: Methods and Results,” **AIM 2019** workshop in conjunction with **ICCV**, 2019.
- Seungjun Nah, Sungyong Baik, Seokil Hong, Gyeongsik Moon, **Sanghyun Son**, Radu Timofte, and Kyoung Mu Lee, “NTIRE 2019 Challenge on Video Deblurring and Super-Resolution: Dataset and Study,” **NTIRE 2019** workshop in conjunction with **CVPR**, 2019.

Academic Experience & Service

Workshop Challenge Co-organizer

NTIRE 2021 Challenge on Video Super-Resolution, Video Deblurring
[NTIRE 2021 workshop](#) in conjunction with CVPR, 2021 Jun. 2021

AIM 2020 Challenge on Video Temporal Super-Resolution
[AIM 2020 workshop](#) in conjunction with ECCV, 2020 Aug. 2020

AIM 2019 Challenge on Video Temporal Super-Resolution
[AIM 2019 workshop](#) in conjunction with ICCV, 2019 Sep. 2019

Conference Reviewer

CVPR, ECCV, ICCV, and the corresponding Workshops on image restoration

Journal Reviewer

IEEE TPAMI, TIP, TCI
Springer IJCV
Elsevier CVIU

Teaching Assistant

EE729.003: Advanced Trends in Computer Vision (ATCV) Sep. 2020 – Dec. 2020
Seoul National University, Seoul, Korea

Neural Processing Expert (NPEX): Image Restoration Lab. Sep. 2020
Samsung Electronics SNU R&D Center, Seoul, Korea

EE729.001: Topics in Control and Automation Sep. 2019 – Dec. 2019
Seoul National University, Seoul, Korea

Neural Processing Expert (NPEX): Image Restoration Lab. Jul. 2019
Samsung Electronics SNU R&D Center, Seoul, Korea

EE306: Signal and Systems Mar. 2017 – Jun. 2017
Seoul National University, Seoul, Korea

Internship

Student Research Intern Jan. 2019 - Jun. 2019
Research Topic: Real-World Single Image Super-Resolution
Google Cloud, Sunnyvale, CA, USA
Mentor: Ming-Hsuan Yang

Research Projects

MLPerf Mobile AI Benchmark: Super-Resolution Track in conjunction with MLCommons <i>Invited talk:</i> Mobile Super-Resolution: MLPerf App - Benchmarking and Challenges Efficient Deep Learning Workshop for Computer Vision, in conjunction with CVPR , 2023.	Apr. 2022 – Mar. 2023
Pixel-wise Adaptive Weighting for Perceptual Image Super-Resolution Naver	May 2022 – May 2023
Efficient Vision Transformer for Image Super-Resolution Naver	May 2021 – May 2022
Raw Food Image Generation by Domain Adaptation Samsung Research	Dec. 2020 – Dec. 2021

Awards and Honors

- **The KCCV Sang-Uk Lee Prize** (Test of Time award) from KCCV 2022.
- Winner of **Qualcomm Innovation Fellowship Korea** 2021.
- **Highly Cited Paper Award** from Department of ECE, SNU, 2018.
- **1st Place Award** in NTIRE 2017 Challenge on Single Image Super-Resolution.
- **Best Paper Award** of NTIRE 2017 Workshop: Challenge Track.

Scholarships

• Youlchon AI Stars Scholarship , Youlchon Foundation	2022
• Kwanjeong Scholarship , Kwanjeong Educational Foundation	2017 – 2018
• National Scholarship for Science & Engineering , Korea Student Aid Foundation	2015 – 2016
• Scholarship of Academic Excellence , Seoul National University	2013 – 2014

Skills

PyTorch, Python, C++, MATLAB, CUDA, L^AT_EX

Research Interests

I am interested in deep learning and low-level image restoration problems, especially image super-resolution, denoising, and deblurring. Recently I mainly working on reconstructing high-resolution images from real-world inputs. My research topics also include network optimization and acceleration to handle practical issues in deep learning.

References

Advisor Kyoung Mu Lee
 Professor
 Seoul National University
 kyoungmu(at)snu.ac.kr
 <https://cv.snu.ac.kr/index.php/kmlee>

Mentor Ming-Hsuan Yang
 Professor
 UC Merced, Google
 mhyang(at)ucmerced.edu
 <http://faculty.ucmerced.edu/mhyang>