Seungjae Han

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I am a PhD candidate interested in developing computational technologies to acquire & analyze big data from brain.
My particular interests are fast & scalable processing algorithm and AI-driven microscopy.
I received **2023 Trainee Profesional Development Award** from Society for Neuroscience (SfN)
and **Outstanding Research Award** from Association of Korean Neuroscientists.

EDUCATION

2020-Now	**KAIST**	Daejeon, South Korea
	Ph.D. Candidate in School of Electrical Engineering	Advisor : Young-Gyu Yoon
2017-20	**Yonsei University**	Seoul, South Korea
	Bachelor of Science in School of Integrated Technology	Advisor : Jiwon Seo

PUBLICATIONS

* co-first authors, ** co-corresponding authors

2025   **Nanoscale resolution imaging of the whole mouse embryos and larval zebrafish using expansion microscopy**
J. Sim*, C. E Park*, I. Cho*, K. Min, M. Eom, <u>S. Han</u>, H. Jeon, E.-S. Cho, Y. Lee, Y. H. Yun, S. Lee, D.-H. Cheon, J. Kim, M. Kim, H.-J. Cho, J.-W. Park, A. Kumar, Y. Chong, J. S. Kang, K. D. Piatkevich, E. E. Jung, D.-S. Kang, S.-K. Kwon, J. Kim, K.-J. Yoon, J.-S. Lee, C.-H. Kim, M. Choi, J. W. Kim, M.-R. Song, H. J. Choi, E. S. Boyden, Y.-G. Yoon**, J.-B. Chang**
ACS Nano (accepted)

Design Principles of Multi-Scale J-invariant Networks for Self-Supervised Image Denoising
H. Yu*, <u>S. Han</u>*, Y.-G. Yoon
*IEEE/CVF Winter Conference on Applications of Computer Vision (**WACV**)* (accepted)

Self-supervised video processing with self-calibration on an analogue selector-less memristor array-based platform
H. Jeong* , <u>S. Han</u>*, S.-O. Park, T. R. Kim, J. Bae, T.-H. Jang, Y. Cho, S. Seo, H.-J. Jeong, S. Park, T. Park, J. Oh, J. Park, D. Jeon, I. Kwon , Y.-G. Yoon**, S. Choi**
Nature Electronics

2024   **In Vivo Optical Clearing of Mammalian Brain**
G. T. Franzesi*, I. Gupta*, M. Hu, K. Piatkevich, M. Yildirim, J.-P. Zhao, M. Eom, <u>S. Han</u>, D. Park, H. Andaraarachchi, Z. Li, J. Greenhagen, A. M. Islam, P. Vashishtha, Z. Yaqoob, N. Pak, A. D Wissner-Gross, D. A. Martin-Alarcon, J. J. Veinot, P. T. C. So, U. Kortshagen, Y.-G. Yoon, M. Sur**, E. S. Boyden**
bioRxiv

From Pixels to Information: Artificial Intelligence in Fluorescence Microscopy
<u>S. Han</u>, J. Y. You, M. Eom, S. Ahn, E.-S. Cho, Y.-G. Yoon
Advanced Photonics Research

2023   **Statistically unbiased prediction enables accurate denoising of voltage imaging data**
M. Eom*, <u>S. Han</u>*, P. Park*, G. Kim, E.-S. Cho, J. Sim, K.-H. Lee, S. Kim, H. Tian, U. L. Böhm, E. Lowet, H. Tseng, J. Choi, S. E. Lucia, S. H. Ryu, M. Rózsa, S. Chang, P. Kim, X. Han, K. D. Piatkevich, M. Choi, C.-H. Kim, A. E. Cohen, J.-B. Chang, Y.-G. Yoon
Nature Methods [🏆 Selected as the cover, KAIST News, and KAIST Breakthrough]

***In vivo* whole-brain imaging of zebrafish larvae using three-dimensional fluorescence microscopy**
E.-S. Cho, <u>S. Han</u>, G. Kim, M. Eom, K.-H. Lee, C.-H. Kim, Y.-G. Yoon
Journal of Visualized Experiments

Robust and Efficient Alignment of Calcium Imaging Data through Simultaneous Low Rank and Sparse Decomposition
J. Cho*, <u>S. Han</u>*, E.-S. Cho, K. Shin, Y.-G. Yoon
*IEEE/CVF Winter Conference on Applications of Computer Vision (**WACV**)*

2022   **IMPASTO: Multiplexed cyclic imaging without signal removal via self-supervised neural unmixing**
H. Kim*, S. Bae*, J. Cho, H. Nam, J. Seo, <u>S. Han</u>, E. Yi, E. Kim, Y.-G. Yoon**, J.-B. Chang**
bioRxiv

Three-dimensional fluorescence microscopy through virtual refocusing using a recursive light propagation network
C. Shin*, H. Ryu*, E.-S. Cho, <u>S. Han</u>, K.-H. Lee, C.-H. Kim, Y.-G. Yoon
Medical Image Analysis

2021   **3DM: Deep decomposition and deconvolution microscopy for rapid neural activity imaging**
E.-S. Cho*, <u>S. Han</u>*, K.-H. Lee, C.-H. Kim, Y.-G. Yoon
Optics Express   [🏆 Selected as Editor's pick and Image of the Week]

Efficient Neural Network Approximation of Robust PCA for Automated Analysis of Calcium Imaging Data
<u>S. Han</u>, E.-S. Cho, I. Park, K. Shin, Y.-G. Yoon
*International Conference on Medical Image Computing and Computer Assisted Intervention (**MICCAI**)*

2019   **Smartphone Application to Estimate Distances from LTE Base Stations Based on Received Signal Strength Measurements**
<u>S. Han</u>, T. Kang, J. Seo
*International Technical Conference on Circuits/Systems, Computers and Communications (**ITC-CSCC**)*

2018   **Observation of Human Trajectory in Response to Haptic Feedback from Mobile Robot**
H.-S. Moon, W. Kim, <u>S. Han</u>, J. Seo
*International Conference on Control, Automation and Systems (**ICCAS**)*

AWARDS AND HONORS

2024	**2024 KAIST Graduate Student Outstanding Paper Award**	KAIST
	Top reviewer of NeurIPS 2024 & Complimentary registration	NeurIPS
2023	**Trainee Professional Development Award**	Society for Neuroscience
	AKN Outstanding Research Award (IBS/AKN Pre-doctoral award)	Association of Korean Neuroscientists
	Best Teaching Assistant Award (Course: Signals and Systems)	KAIST EE
2020-2025	**Government-sponsored scholar**	KAIST
2019	**Undergraduate Research Program (Research fund) & Outstanding Project Award**	
		Korea Foundation for the Advancement of Science & Creativity
2019	**Short-term visiting researcher to Boğaziçi University, Turkey (Travel and lodging cost)**	Yonsei University
2019	**Excellence Award (START-UP102: Enterprise and Entrepreneurship)**	Yonsei University
2017-19	**IT Consilience Creative Program (Tuition waiver & stipend)**	Ministry of Science, ICT and Future Planning

TALKS

2023   **SUPPORT: Versatile denoising AI for microscopy data**

Korea Institute of Science and Technology (KIST) (2023. 10.)

PROFESSIONAL SERVICE

Reviewer   **NeurIPS** 2023 (5 papers), 2024 (6 papers, **Selected as Top reviewer**)
ICLR 2024 (3 papers), **AAAI** 2025 (4 papers)
MICCAI 2022 (5 papers), 2023 (3 papers), 2024 (4 papers)

MENTORING EXPERIENCE

2024   **Hayeong Yu** (Undergraduate Student - M.S. student at KAIST)
Self-supervised learning, Image processing, Denoising (paper published on WACV)

2021   **Eunsu Kim** (Undergraduate Student at KAIST)
Machine learning basics, Processing multiplexed images (preprint released on bioRxiv)

TEACHING EXPERIENCE

Teaching assistant (TA)

2023   **Machine learning and Big data (Expert course)**, Seongnam-KAIST Center For Next Generation ICT
Course for general public and office workers, about Reinforcement Learning, **Head TA**

Signals and Systems (EE205), KAIST
Introductory level course, **Head TA**, [🏆 **Best Teaching Assistant Award**]

2022   **Electronics Design Lab (EE305)**, KAIST
Undergraduate level course, about Circuits

Special Topics in Electrical Engineering <AI Capston Design> (EE488), KAIST
Senior level course, about Reinforcement Learning, **Head TA**

2021   **Electronics Design Lab (EE405A)**, KAIST
Senior level course, about Robotics

Basics of Artificial Intelligence (CoE202A), KAIST
Introductory level course, about Computer Vision

2020   **Basics of Artificial Intelligence (CoE202A)**, KAIST
Introductory level course, about Computer Vision

REFERENCES

available upon request

Design of this CV is based on Mina Lee's CV