

Seungjae Han

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🔗 Google Scholar

I am a PhD candidate interested in developing novel technologies to acquire & analyze big data from brain. My particular interests are fast & scalable processing algorithm and AI-driven microscopy.

I am developing **ultimate pipeline** to **understand the whole brain activity!**

[Rapid image acquisition](#) → [Image alignment](#) → [Denoising](#) → [Activity extraction](#) → In progress...

I am a recipient of **2023 Trainee Profesional Development Award** of Society for Neuroscience (SfN).

Keywords

Neuroengineering
Computational imaging
Computer vision
Optimization
Signal processing

EDUCATION

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

PUBLICATIONS

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

- 2023 **Statistically unbiased prediction enables accurate denoising of voltage imaging data**
M. Eom*, **S. Han***, 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**]
- In vivo whole-brain imaging of zebrafish larvae using three-dimensional fluorescence microscopy**
E.-S. Cho, **S. Han**, 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*, **S. Han***, 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, **S. Han**, 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, **S. Han**, K.-H. Lee, C.-H. Kim, Y.-G. Yoon
Medical Image Analysis
- 2021 **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, **S. Han**, H. Jeon, H.-J. Cho, E.-S. Cho, 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, E. S. Boyden, Y.-G. Yoon**, J.-B. Chang**
bioRxiv
- 3DM: Deep decomposition and deconvolution microscopy for rapid neural activity imaging**
E.-S. Cho*, **S. Han***, K.-H. Lee, C.-H. Kim, Y.-G. Yoon
Optics Express [🏆 **Editor's pick, Image of the Week**]

Efficient Neural Network Approximation of Robust PCA for Automated Analysis of Calcium Imaging Data

S. Han, 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**

S. Han, T. Kang, J. Seo

International Technical Conference on Circuits/Systems, Computers and Communications (ITC-CSCC) [**Oral**]

2018 **Observation of Human Trajectory in Response to Haptic Feedback from Mobile Robot**

H.-S. Moon, W. Kim, **S. Han**, J. Seo

International Conference on Control, Automation and Systems (ICCAS)

PUBLICATIONS (Domestic)

2019 **Machine Learning Based Sound Source Localization in the Indoor Environment**

S. Han, S. Kim, J. Seo

Korean Navigation Institute (KONI) Conference

Sound Source Localization in the Indoor Environment Based on Time Difference of Arrival Measurements

S. Kim, **S. Han**, J. Seo

Korean Navigation Institute (KONI) Conference

2018 **Development of Human Following Mobile Robot Utilizing Haptic Signals**

S. Han, H.-S. Moon, J. Seo

Korean Navigation Institute (KONI) Conference

AWARDS AND HONORS

2023 **AKN Outstanding Research Award (IBS/AKN Pre-doctoral award)** Association of Korean Neuroscientists

Trainee Professional Development Award

Society for Neuroscience

Best Teaching Assistant Award (Course: Signals and Systems)

KAIST EE

2020-Now **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 (Full tuition waiver & monthly stipend throughout undergraduate)**

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.)

2022 **Efficient methods to analyze big data from the brain**

Songlim high school (2022. 8.)

PROFESSIONAL SERVICE

Reviewer **ICLR 2024** (3 papers)

NeurIPS 2023 (5 papers)

MICCAI 2022 (5 papers), 2023 (3 papers)

MENTORING EXPERIENCE

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

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

Young-Gyu Yoon, Associate professor at KAIST

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🏠 [Lab homepage](#)

Kijung Shin, Associate Professor at KAIST

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