

Seungjae Han

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🏠 [stevejayh.github.io](https://github.com/stevejayh)

🐙 SteveJayH
🔗 [Google Scholar](https://scholar.google.com/citations?user=SteveJayH)

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...

Keywords

Neuroengineering
Computational imaging
Computer vision
Optimization
Signal processing

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

- 2023 **Statistically unbiased prediction enables accurate denoising of voltage imaging data**
Minho Eom*, **Seungjae Han***, Pojeong Park*, Gyuri Kim, Eun-Seo Cho, Jueun Sim, Kang-Han Lee, Seonghoon Kim, He Tian, Urs L. Böhm, Eric Lowet, Hua-an Tseng, Jieun Choi, Stephani Edwina Lucia, Seung Hyun Ryu, Márton Rózsa, Karel Svoboda, Sunghoe Chang, Pilhan Kim, Xue Han, Kiryl D. Piatkevich, Myunghwan Choi, Cheol-Hee Kim, Adam Cohen, Jae-Byum Chang, Young-Gyu Yoon
bioRxiv
- In vivo whole-brain imaging of zebrafish larvae using three-dimensional fluorescence microscopy**
Eun-Seo Cho, **Seungjae Han**, Gyuri Kim, Minho Eom, Kang-Han Lee, Cheol-Hee Kim, Young-Gyu Yoon
Journal of Visualized Experiments
- Robust and Efficient Alignment of Calcium Imaging Data through Simultaneous Low Rank and Sparse Decomposition**
Junmo Cho*, **Seungjae Han***, Eun-Seo Cho, Kijung Shin, Young-Gyu Yoon
IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)
- 2022 **IMPASTO: Multiplexed cyclic imaging without signal removal via self-supervised neural unmixing**
Hyunwoo Kim*, Seoungbin Bae*, Junmo Cho, Hyeon Nam, Junyoung Seo, **Seungjae Han**, Euiin Yi, Eunsu Kim, Young-Gyu Yoon**, Jae-Byum Chang**
bioRxiv
- Three-dimensional fluorescence microscopy through virtual refocusing using a recursive light propagation network**
Changyeop Shin*, Hyun Ryu*, Eun-Seo-Cho, **Seungjae Han**, Kang-Han Lee, Cheol-Hee Kim, Young-Gyu Yoon
Medical Image Analysis
- 2021 **Nanoscale resolution imaging of the whole mouse embryos and larval zebrafish using expansion microscopy**
Jueun Sim*, Chan E Park*, In Cho*, Kyeongbae Min, Minho Eom, **Seungjae Han**, Hyungju Jeon, Hyun-Ju Cho, Eun-Seo Cho, Ajeet Kumar, Yosep Chong, Jeong Seuk Kang, Kiryl D. Piatkevich, Erica E. Jung, Du-Seock Kang, Seok-Kyu Kwon, Jinhyun Kim, Ki-Jun Yoon, Jeong-Soo Lee, Edward S. Boyden, Young-Gyu Yoon**, Jae-Byum Chang**
Nature Biotechnology (In revision)
- 3DM: Deep decomposition and deconvolution microscopy for rapid neural activity imaging**
Eun-Seo Cho*, **Seungjae Han***, Kang-Han Lee, Cheol-Hee Kim, Young-Gyu Yoon
Optics Express [🏆 **Editor's pick, Image of the Week**]

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

Seungjae Han, Eun-Seo Cho, Inkyu Park, Kijung Shin, Young-Gyu 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**

Seungjae Han, Taewon Kang, Jiwon 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**

Hee-Seung Moon, Woohyun Kim, **Seungjae Han**, Jiwon Seo

International Conference on Control, Automation and Systems (ICCAS)

PUBLICATIONS (Domestic)

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

Seungjae Han, Sanghyeon Kim, Jiwon Seo

Korean Navigation Institute (KONI) Conference

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

Sanghyeon Kim, **Seungjae Han**, Jiwon Seo

Korean Navigation Institute (KONI) Conference

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

Seungjae Han, Hee-Seung Moon, Jiwon Seo

Korean Navigation Institute (KONI) Conference

AWARDS AND HONORS

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 (Tuition waiver & monthly stipend),**

Ministry of Science, ICT and Future Planning

TALKS

2022 **Efficient methods to analyze big data from the brain, Songlim high school (2022. 8)**

PROFESSIONAL SERVICE

Reviewer **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 **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

Ph.D. advisor at KAIST

✉ ygyoon@kaist.ac.kr

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Kijung Shin, Associate Professor at KAIST

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