

CURRICULUM VITAE / RESUME

Jaehyeok Bae

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INTERESTS

- Computer vision, Machine learning; Biomedical imaging
- CV/ML applications for medical / industrial / bioinformatics domains

EDUCATION

Seoul National University **Mar 2016 - Aug 2023***
B.S. in Electrical and Computer Engineering *Seoul, South Korea*

- Graduate Summa cum laude (5th place / 148), Total GPA : 4.23 / 4.30 (Major GPA : 4.27 / 4.30)
- * Served mandatory military service between 2018 - 2019

RESEARCH EXPERIENCES

Lab. for Imaging Science and Technology Mar 2023 - Present
Undergraduate Research Intern (Advisor : Prof. Jongho Lee) *Seoul National University*

- Proposed a novel adaptive selection scheme of sampling-reconstruction pairs for Fourier compressed sensing(CS) by quantifying the high-frequency Bayesian uncertainty of the input. [1]
- Achieved significant improvements on several Fourier CS problems, including Accelerated MRI.

Gauss Labs Inc. Jan 2022 - Nov 2022
Computer Vision Applied Scientist Intern *230 Homer Ave, Palo Alto, CA 94301*

- Proposed a novel anomaly detection and localization algorithm for industrial datasets, by training a normal feature distribution using position and neighborhood information of local features. [2]
- Achieved a state-of-the-art anomaly localization performance on several datasets, including MVTec AD.

Optical Engineering and Quantum Electronics Lab. Mar 2021 - Dec 2021
Undergraduate Research Intern (Advisor : Prof. Byounggho Lee) *Seoul National University*

- Proposed a gaze-contingent augmented reality(AR) rendering system for video see-through display with a focus-tunable lens(FTL), a pupil tracker, and a time-of-flight(ToF) camera.

3D Vision Lab. April 2020 - Mar 2021
Undergraduate Research Intern (Advisor : Prof. Youngmin Kim) *Seoul National University*

- Created N-ImageNet, a large dataset for robust object recognition with event cameras. [3]
- Circuit-level analysis on event camera to investigate noise sources, such as hot pixels and background noises.

PUBLICATIONS

- [1] S. Hong, **J. Bae**, J. Lee, and S. Y. Chun, "Adaptive selection of sampling-reconstruction in Fourier compressed sensing," in *Proceedings of The IEEE / CVF Computer Vision and Pattern Recognition Conference (CVPR)*, 2024 (under review)
- [2] **J. Bae**, J. Lee, and S. Kim, "PNI : Industrial anomaly detection using position and neighborhood information," in *Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV)*, 2023
- [3] J. Kim, **J. Bae**, G. Park, D. Zhang, and Y. Kim, "N-ImageNet: Towards robust, fine-grained object recognition with event cameras," in *Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV)*, 2021
- [4] Y. Park, **J. Bae**, and J. Lee, "Design of a perforated panel for transmission noise reduction," *Transactions of the Korean Society of Mechanical Engineers. A*, 04 2015

SKILLS & LANGUAGES

Programming Languages	Python, MATLAB, C/C++, C#
Libraries/Frameworks	PyTorch, Scikit-learn
Developer Tools	GitHub, VS Code, Jupyter, Google Cloud Platform, Linux, Unity
Simulation Tools	LTspice, Multisim
Languages	English(fluent), Korean(native)

AWARDS AND SCHOLARSHIPS

2nd place in the 2022 SNU FastMRI Challenge, <i>Seoul National University</i>	2022
- Proposed an algorithm to restore an aliased image from Accelerated MRI to an aliasing-free image.	
Silver Medal in the University Students Mathematics Contest, <i>Korean Mathematical Society</i>	2017
Grand Prize in the Korea Youth Science Olympiad (Physics)	2015
Gold Medal in the Korea Youth Science Olympiad (Mathematics)	2015
Presidential Science Scholarship , <i>Korea Student Aid Foundation (KOSAF)</i>	2016 - 2021
- 4-year Full tuition and additional stipends (\$5,000 / year) for academic excellence.	

TEACHING AND VOLUNTEERING EXPERIENCES

Contest Coordinator	
Organized and supervised the 2023 SNU FastMRI Challenge, <i>Seoul National University</i>	2023
- Designed the task of challenge, and evaluated the models proposed by participants.	
Undergraduate Student Tutor , <i>Seoul National University</i>	
Introduction to Random Variables and Random Processes	Spring 2023
Introduction to Communications	Fall 2021
Introduction to Algorithms	Spring 2021, Fall 2022
Foundation of Physics 1 & 2	2017, 2020
Mentoring	
International Students Integrated Peer Tutoring Program, <i>Seoul National University</i>	Fall 2021
University Student's Talent Donation Camp, <i>Korea Student Aid Foundation</i>	2016, 2017
- Taught basics of mathematics and physics to underprivileged students.	

EXTRACURRICULAR ACTIVITIES

SNU Tomorrow's Edge Membership(STEM)	Mar 2021 - Aug 2022
<i>12th Vice Chairman of SNU Honor Society</i>	<i>College of Engineering, Seoul National University</i>
<ul style="list-style-type: none">· A student organization that presents a vision of "Outstanding engineering knowledge, broad consideration of different perspectives, and active communication with society."· Served as a leader of 200+ STEM members, encouraged activities; interdisciplinary academic seminars, and mentoring programs for teenagers.· Wrote a book for raising scholarships to future engineers: <i>Wanna be Engineer</i>, Megastudy-books, 2021.	
Republic of Korea Army	Jan 2018 - Sep 2019
<i>Soldier of Information Security Specialist</i>	<i>Gyeryong, Republic of Korea</i>
<ul style="list-style-type: none">· Completed mandatory military service (honorable discharge)· Information protection tasks to prevent computer viruses and hacking at the Army headquarters.	