

# CURRICULUM VITAE / RESUME

Jaehyeok Bae

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## INTERESTS

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- Computer vision for biomedical imaging
- Physics-based deep learning for clinical applications

## EDUCATION

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**Seoul National University**

*B.S. in Electrical and Computer Engineering*

**Mar 2016 - Aug 2023\***

*Seoul, South Korea*

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

## RESEARCH EXPERIENCES

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**Lab. for Imaging Science and Technology**

*Research Intern (Advisor : Prof. Jongho Lee)*

Mar 2023 - Present

*Seoul National University*

- Proposed a novel mean-squared error estimator in the frequency domain to generate an optimal sampling mask in Accelerated MRI.
- Theoretically and experimentally showed that constructing patient-specific adaptive sampling-reconstruction pairs, namely *adaptive selection*, is better than the conventional non-adaptive sampling method. [1]

**Gauss Labs Inc.**

*Computer Vision Applied Scientist Intern*

Jan 2022 - Nov 2022

*230 Homer Ave, Palo Alto, CA 94301*

- Improved an unsupervised anomaly detection algorithm on CD-SEM Images.
- Achieved a state-of-the-art anomaly localization performance on industrial datasets. [2]

**Optical Engineering and Quantum Electronics Lab.**

*Research Intern (Advisor : Prof. Byoungcho Lee)*

Mar 2021 - Dec 2021

*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.**

*Research Intern (Advisor : Prof. Youngmin Kim)*

April 2020 - Mar 2021

*Seoul National University*

- Created N-ImageNet, a large dataset for robust object recognition with event cameras. [3]
- Verified that pretraining on N-ImageNet improves the performance of event-based classifiers.

## PUBLICATIONS

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- [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

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

## AWARDS AND SCHOLARSHIPS

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<b>2nd place</b> 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.	
<b>Silver Medal</b> in the University Students Mathematics Contest, <i>Korean Mathematical Society</i>	2017
<b>Grand Prize</b> in the Korea Youth Science Olympiad (Physics)	2015
<b>Gold Medal</b> in the Korea Youth Science Olympiad (Mathematics)	2015
<b>Presidential Science Scholarship</b> , <i>Korea Student Aid Foundation (KOSAF)</i>	2016 - 2021
- 4-year Full tuition and additional stipends (\$4,000 / year) for academic excellence.	

## TEACHING AND VOLUNTEERING EXPERIENCES

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<b>Contest Coordinator</b>	
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.	
<b>Undergraduate Teaching Assistant</b> , <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
<b>Mentoring</b>	
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

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<b>SNU Tomorrow's Edge Membership(STEM)</b>	Mar 2021 - Aug 2022
<i>12<sup>th</sup> Vice Chairman of SNU Honor Society</i>	<i>College of Engineering, Seoul National University</i>
<ul style="list-style-type: none"><li>· A student organization that presents a vision of "Outstanding engineering knowledge, broad consideration of different perspectives, and active communication with society."</li><li>· Served as a leader of 200+ STEM members, encouraged activities; interdisciplinary academic seminar and mentoring program for teenagers.</li><li>· Wrote a book for future engineers and raising scholarship: <i>Wanna be Engineer</i>, Megastudy-books, 2021. (ISBN: 9791129708168, [book])</li></ul>	
<b>Republic of Korea Army</b>	Jan 2018 - Sep 2019
<i>Soldier of Information Security Specialist</i>	<i>Gyeryong, Republic of Korea</i>
<ul style="list-style-type: none"><li>· Completed mandatory military service (honorable discharge)</li><li>· Information protection tasks to prevent computer viruses and hacking at the Army headquarters.</li></ul>	