# CURRICULUM VITAE / RESUME

## Jaehyeok Bae

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## INTERESTS

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

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## EDUCATION

**Stanford University**                                                      **Sep 2024 - Present**
*Ph.D. in Electrical Engineering*                                            *Stanford, CA 94305*

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

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

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## RESEARCH EXPERIENCES

**Lab. for Imaging Science and Technology**                                  Mar 2023 - Nov 2023
*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. Byoungho 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.

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## 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 European Conference on Computer Vision (ECCV)*, 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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| **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, *Seoul National University*     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, *Korean Mathematical Society*     2017
**Grand Prize** in the Korea Youth Science Olympiad (Physics)     2015
**Gold Medal** in the Korea Youth Science Olympiad (Mathematics)     2015

**Presidential Science Scholarship**, *Korea Student Aid Foundation (KOSAF)*     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, *Seoul National University*     2023
- Designed the task of challenge, and evaluated the models proposed by participants.

**Undergraduate Student Tutor**, *Seoul National University*

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| 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, *Seoul National University*     Fall 2021

University Student's Talent Donation Camp, *Korea Student Aid Foundation*     2016, 2017
- Taught basics of mathematics and physics to underprivileged students.

## EXTRACURRICULAR ACTIVITIES

**SNU Tomorrow's Edge Membership(STEM)**     Mar 2021 - Aug 2022
*$12^{th}$ Vice Chairman of SNU Honor Society*     *College of Engineering, Seoul National University*

· 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: *Wanna be Engineer*, Megastudy-books, 2021.

**Republic of Korea Army**     Jan 2018 - Sep 2019
*Soldier of Information Security Specialist*     *Gyeryong, Republic of Korea*

· Completed mandatory military service (honorable discharge)
· Information protection tasks to prevent computer viruses and hacking at the Army headquarters.