Curriculum Vitae

# *Hyeonbeen Jeon*

Email | Website | Github | LinkedIn

*Last Updated in February, 2026*

## Education

**Yonsei University** Seoul, Korea
B.S. Student in Physics Mar.2020 - Feb.2027 (Expected)
B.S. Student in Electrical & Electronic Engineering
• Total GPA: 4.12/4.3

## Research Interests

Neural Network Compression, Diffusion Models, Efficient AI

## Relevant Course in Undergraduate

- Mathematics
  `[EEE3315]` Linear Algebra for Electrical and Electronic Systems / `[EEE3410]` Probability and Random Variables / `[MAT2001]` Advanced Calculus (1) / `[MAT2017]` Engineering Mathematics (4) / `[MAT3104]` Analysis I (In Progress)
- AI
  `[EEE3414]` Introduction Artificial Intelligence / `[EEE3545]` Fundamental Computer Vision / `[EEE3551]` Intelligent System Design And Applications / `[EEE4423]` Deep Learning LAB. (In Progress) / `[CAS4160]` Reinforcement Learning (In Progress)

## Undergraduate Projects

**100-class Face Recognition via Transfer Learning with Pre-trained ResNet-18**
PyTorch Fall 2025, Introduction to Artificial Intelligence

- Implemented training pipelines for a given face recognition dataset (5,000 images, 100-class), considering its small size and low similarity to ImageNet.
- Established a baseline by using linear probing and adjusting stem strides for resolution mismatch with ImageNet, achieving 56.4% accuracy.
- Improved the baseline by progressively expanding the fine-tuning scope with layer-wise learning rate decay and enhancing generalization through data augmentation tailored to model capacity.
- Achieved the highest accuracy (**95.7%**) by fine-tuning the entire network including stem layers, addressing the mismatch from the stride adjustment without training in the baseline.

**Training-free CAM-based Object Localization with Fully Convolutional ResNet-18**
PyTorch Fall 2025, Introduction to Artificial Intelligence

- Converted a pre-trained ResNet-18 into a fully convolutional network by replacing the GAP layer with average pooling and reformulating the FC layer as a $1 \times 1$ convolution.

- Performed object localization by upsampling class activation maps to the original input resolution and generating bounding boxes for regions exceeding a specific threshold.
- Analyzed model limitations, such as partial coverage of discriminative parts and the inability to localize multiple objects, unseen classes, or high-resolution images.

**Efficient CNN Accelerator Design using Row-stationary Dataflow and Ternary Quantization**
Verilog, FPGA, PyTorch Spring 2025, Intelligent System Design and Applications

- Applied the row-stationary dataflow to the line buffers to maximize data reuse and minimize redundant memory access during convolution.
- Reduced inference latency to 123.75$\mu s$ per image by utilizing the pooling layer as a buffer for pipelined layer execution and applying batch processing to alleviate BRAM-external memory bottlenecks.
- Enhanced inference efficiency by applying ternary quantization to INT8 weights, maintaining 95% accuracy through Leaky ReLU integration and hyperparameter optimization.

**Julia Set Visualization on FPGA with LCD Output**
Verilog, FPGA Fall 2024, Introductory Digital Labs

- Implemented an FSM-based system that computes the iterative formula of the Julia set using fixed-point multiplication (Q format).
- Developed an interactive Julia set visualizer on an LCD screen with adjustable parameters and zoom levels by mapping pixel coordinates to the complex plane.

## Extracurricular Activities

**Yonsei Artificial Intelligence Club (YAI) 16th** Fall 2025 - Present

- Participated in group studies to discuss and review key computer vision papers (e.g., classification, object detection, generative models, etc.) and study the mathematical backgrounds (e.g., analysis)
- Implemented the reviewed models through collaborative projects using PyTorch.

**Diffusion Models Seminar (Instructor: Prof. Kyungwoo Song)** Dec. 2025 - Present

- Studied and discussed the theoretical foundations of diffusion models using "The Principles of Diffusion Models" (Chieh-Hsin Lai et al.) as the primary textbook.
- Developed a unified and systemic perspective on diffusion models by interpreting Variational, Score-based, and Flow-based frameworks.

## Awards & Honors

- Honors Feb. 2025
- High Honors Feb. 2021
- Yonsei Veritas Scholarship (GPA Based) Jun. 2021, Feb. 2025, Aug. 2025
- 2023 KMS Mathematics Competition for University Students Dec. 2023
  Non-mathematics major fields, 3rd Prize
- 2020 Yonsei-Nexon $\sqrt{i}$ RC Creative Platform, 4th Prize Dec. 2020

## Skills & Techniques

Coding Skills PyTorch, Python, Verilog HDL, C/C++, LaTeX

## Others

Mandatory Military Service — Nov.2022 - May.2024
Republic of Korea Army — Sergeant, Honorable Discharge