Curriculum Vitae

Hyeonbeen Jeon

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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

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 1×1 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 (VAE to DDPM), Score-based (EBM to NCSM), and Flow-based (NF to Flow matching) frameworks, including fast sampling and generation techniques.

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