



Daeseok Song

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Research Objective

As an AI engineer who has directly tackled the inefficiencies of AI in the industry for three years, I have come to recognize that the physical limitations of the current AI industry, such as power consumption and space, stem from the von Neumann architecture. Under this conviction, my core research objective is to make the efficient AI, created by brain-inspired Spiking Neural Networks (SNNs) and neuromorphic computing, universally accessible. Ultimately, I aim to establish a general-purpose learning methodology for SNNs, much like Geoffrey Hinton did for ANNs with Backpropagation.

1 Research Interests

- **Efficient:** Spiking Neural Networks, On-Device Learning
- **Brain-inspired:** Computational Neuroscience, Neuromorphic Computing
- **Learning Theory:** Reinforcement Learning, Forward-Forward, Lifelong Learning, Self-Supervised Learning

2 Education

University of Suwon

2017.03 – 2023.02

Bachelor of Science in Information Security

- **Valedictorian**, GPA: 4.29/4.5 (Major GPA: 4.37/4.5)
- **Relevant Coursework:** Algorithms (A+), Computer Architecture (A+), Probability Theory (A+), Calculus I (A+), Data Structures (A0)

3 Research & Industry Experience

Connective Co., Ltd.

Seoul, Korea

AI Engineer

Nov 2022 – Present

- **Pioneered a preliminary study on next-generation low-power AI models:** Investigated the energy efficiency of SNNs and brain-inspired computation, leading research and knowledge sharing on core concepts like Surrogate Gradients to validate their technical feasibility.
- **Researched and developed a Multi-Task Learning framework:** Designed and implemented an end-to-end MTL pipeline to unify four individual vision models. Achieved a about 52% reduction in total model size, saving approx. And improving accuracy by over 3%. Designed a header ensemble structure for enhanced classification robustness.
- **Led the commercialization of a medical AI model:** As a founding AI engineer, drove the entire development process, playing a key role in the company's first commercial product launch, its approval by the UAE Ministry of Health, and the technical documentation for European MDR certification.
- **Optimized deep learning model performance:** Re-architected the initial baseline model's training and inference methods, increasing average accuracy by over 10% and establishing a systematic "labeling-train-productization" pipeline.

- **Developed an OpenCV-based barcode recognition algorithm:** Applied image preprocessing techniques (e.g., Thresholding, Morphology) to improve the recognition rate of a legacy system from 70% to over 90%. Deployed the solution reliably as a C++ DLL after rigorous memory leak testing.

4 Publications & Patents

1. **Accurate, automated classification of radiographic knee osteoarthritis severity using a novel method of deep learning: Plug-in modules**
Knee Surgery & Related Research (SCIE), 2024
Daeseok Song (2nd Author, Lead Algorithm Developer): Inspired by the consensus-based decision-making process of clinicians, I solely conceived and developed an ensemble technique that improved model accuracy by approx. 2-3%.
2. **Ensemble System and Method for Improving Knee Osteoarthritis Classification Accuracy**
International Patent (PCT/KR2025/012689), Korean Patent (10-2024-0124529)
Daeseok Song (Inventor)
3. **Image size transformation data augmentation method for lesion segmentation on normalization and argumentation medical images**
KSC 2022
Daeseok Song (1st Author, AI Model Developer): Demonstrated that a simple data augmentation strategy could significantly boost a medical image segmentation model's Dice Score from 86.95% to 90.48% without complex methods.

5 Selected Projects

LSTM-based Agricultural Price Prediction Model (Team Leader, 2021) *2nd Prize, AI Idea Competition*

- To build a foundation in time-series data modeling, I collected and preprocessed multivariate data (weather, price, etc.) and successfully developed an LSTM network for agricultural price prediction (MSE 0.0508)..

Personalized Chatbot "Aengmu" using KakaoTalk Chat History (Personal Project, 2021)

- As an early self-study project to explore NLP fundamentals, I implemented a Seq2Seq/Attention model from scratch in PyTorch to build a chatbot capable of learning and mimicking a user's speaking style.

6 Skills

Languages	Python, C++
AI/ML Frameworks	PyTorch, PyTorch Lightning, OpenCV, Scikit-learn
Tools & Platforms	Git, FastAPI, Torchserve, Atlassian (Jira, Confluence), DICOM