Hun Tae Kim

https://ht0324.github.io

Research Interest

Large Language Models, Mechanistic Interpretability, Reinforcement Learning

Education

University of California, Santa Barbara (UCSB) — Santa Barbara, CA, USA
M.S. in Computer Science — Sep 2025 – Expected Jun 2027

- Courses: Neural Information Retrieval, Continuous Mathematics, AI for Science

Sungkyunkwan University (SKKU) — Seoul, South Korea
B.S. in Computer Science and Engineering — Mar 2019 – Feb 2025

- GPA: 4.11 / 4.5 - Graduated Magna Cum Laude
- Courses: Operating Systems, Reinforcement Learning, Computer Networks, System Programming

The University of Texas at Austin (UT Austin) — Austin, TX, USA
Exchange Student, Electrical and Computer Engineering — Aug 2022 – May 2023

- GPA: 3.78 / 4.0
- Courses: Machine Learning and Edge AI, Computer Architecture, Algorithms, Data Science Laboratory

Research Experience

Human Language Intelligence Lab, SKKU — Suwon, South Korea
Undergraduate Research Assistant (Advisor: Prof. JinYeong Bak) — Jan 2024 – Aug 2024

- Developed modules for sentiment analysis, emotion classification, and self-relatedness for a mental health app in collaboration with Seoul Metropolitan Government and Hanyang Digital Healthcare Center
- Achieved over 89% accuracy using fine-tuned XLM-RoBERTa and LLM prompting techniques
- Conducted research on depression severity prediction using digital phenotyping and encoder-decoder architectures

System Level Design Group, UT Austin — Austin, TX, USA
Undergraduate Research Assistant (Advisor: Prof. Radu Marculescu) — May 2023 – Aug 2023

- Built and optimized a custom Federated Learning framework for edge devices, implementing Conv5 and MobileNetV1 models on Raspberry Pi and Odroid MC1
- Applied structural pruning and Top-k Sparsification, reducing communication rounds by 40%
- Processed 68,000 academic papers to classify research into nine topics and built citation networks using a two-layer GCN, achieving 91.13% accuracy and contributing to an IEEE Access publication

Publications

Three Decades of Low Power: From Watts to Wisdom — Feb 2024
M. Munir, S. Modi, G. Cooper, H. Kim and R. Marculescu

- Analyzed the interdisciplinary evolution and impact of low power technologies across multiple engineering fields using network science to map research trends over 30 years
- Published in *IEEE Access*, vol. 12, pp. 19447-19458, 2024, doi: 10.1109/ACCESS.2024.3361484

Patents & Copyrights

Data Analysis for Ministry of National Defense Mental Health Service — Sep 2024

- Engineered a data preprocessing and analysis pipeline for diary entries of Korean military personnel, supported by the Ministry of Science and ICT and the National Research Foundation of Korea
- Registered the analysis pipeline as a copyright at Korea Copyright Commission (Registration No. R-2024-0692-KR-1)

Emotion Diary Sentiment Classification and Analysis System — Jun 2024

- Leveraged LLMs to quantify emotions in diary entries, powering a mental-health monitoring system
- Patent pending, registered by Seoul National University Research & Development Foundation

Projects

LectureDistill: Long-Form Lecture Summarizer — Suwon, South Korea
Course: Artificial Intelligence Project, Supervisor: Prof. Hogun Park — Sep 2024 – Dec 2024

- Developed a video lecture summarization pipeline using sentence transformers and multiple merging strategies (KNN, DBSCAN) to efficiently process long transcripts (30k - 60k tokens)
- Achieved competitive ROUGE scores and BERTScore using significantly smaller models (406M parameters) compared to traditional LLMs

MoodScope: LLM Journal Coach — Suwon, South Korea
Graduation Project, Supervisor: Prof. JinYeoung Bak — Mar 2024 – Oct 2024

- Developed a full-stack mental health support system integrating multiple LLMs for comprehensive diary analysis
- Implemented real-time voice counseling capabilities using OpenAI's Realtime API to facilitate natural conversational support for users

Game of Compression: Prune & Quantize for Edge Inference — Austin, TX, USA
Course: Machine Learning and Edge AI, Supervisor: Prof. Radu Marculescu — Feb 2023 – Apr 2023

- Optimized MobileNet-v1 through structural pruning and quantization techniques, achieving a 65% reduction in inference time on Raspberry Pi and MC1 edge devices while maintaining model accuracy
- Received the *Best Project Award* for achieving the lowest energy consumption among competing teams

Activities & Leadership

SungKyun English Debate Association — Seoul, South Korea
Vice President — Sep 2023 – Jun 2024

- Organized and led weekly practice sessions focused on Asian and British parliamentary debate styles
- Represented SKKU in multiple tournaments hosted by the Korea Intervarsity Debate Association as both a debater and judge

Seoul Generative AI Explorers Society — Seoul, South Korea
Discussion Leader — Sep 2023 – Jun 2024

- Led bi-weekly discussions and trend analyses for across four universities, focusing on up to date AI trends
- Delivered in-depth analysis on consumer applications and enterprise solutions for generative AI

SG Maple Buddy Program — Seoul, South Korea
Buddy Assistant — Sep 2023 – Dec 2023

- Fostered connections between international exchange students through a cultural exchange program
- Assisted exchange students in adapting to Korean culture and campus life by organizing various activities

Teaching

SKKU International Mentoring — Suwon, South Korea
Teaching Mentor — Mar 2024 – Jun 2024

- Conducted weekly mentoring sessions for international students enrolled in the *Computer Networks* course
- Recognized with the *Outstanding Mentor Award* for exceptional performance

Honors & Awards

Outstanding Mentor Award, SKKU — Spring 2024
Best Project Award, UT Austin — Spring 2023
University Honors, UT Austin — Fall 2022, Spring 2023
Dean's List, SKKU — Spring 2019
Sungkyun Software Full Scholarship, SKKU — Spring 2019 – Fall 2022

Technical Skills

Programming Languages: Python, C/C++, Java, SQL
Machine Learning & Data Science: PyTorch, TensorFlow, ONNX, Scikit-Learn, Matplotlib
Other: LaTeX, Git, Shell, Docker