Hun Tae Kim

https://ht0324.github.io

Research Interest

Large Language Models (LLMs), Synthetic Data Generation, Reinforcement Learning

Education

Sungkyunkwan University (SKKU) Seoul, South Korea

B.S. in Computer Science and Engineering March 2019 – February 2025

- Current Cumulative GPA: 4.09 / 4.50 (95.9 / 100)
- Relevant Coursework: 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 August 2022 – July 2023

- Cumulative GPA: 3.78 / 4.00
- Relevant Coursework: Machine Learning and Data Analytics for 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) January 2024 – August 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 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 – July 2023

- Built and optimized a custom Federated Learning framework for edge devices, implementing Conv5 and MobileNetV1 models on Raspberry Pi
- 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 February 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 September 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 June 2024

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

Projects

SKKU Whiteboard August 2024 – December 2024

Course: Artificial Intelligence Project at SKKU, Supervisor: Prof. Hogun Park

- Designed a video summarization system by segmenting transcripts into fine-grained units, clustering with similarity models, and generating cohesive summaries
- Developed a pipeline capable of adapting to varying transcript lengths and efficiently summarizing content with significantly fewer resources than traditional LLMs

AI Assisted Mental Health Diary Analyzer March 2024 – October 2024

Graduation Project, Supervisor: Prof. JinYeoung Bak

- 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

Edge AI Model Compression and Optimization February 2023 – April 2023

Course: ECE 361E at UT Austin, Supervisor: Prof. Radu Marculescu

- Optimized MobileNet-v1 through structural pruning and quantization techniques, achieving a 65% reduction in inference time while maintaining model accuracy
- Deployed the optimized model on Raspberry Pi and MC1 edge devices and 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 August 2023 – June 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 August 2023 – June 2024

- Led bi-weekly discussions and trend analyses for across 4 universities, focusing on up to date AI trends
- Delivered in-depth analysis on topics such as consumer applications, enterprise solutions, and the technical evolution of generative AI systems

SG Maple Buddy Program Seoul, South Korea

Buddy Assistant August 2023 – December 2023

- Fostered connections between international exchange students through a cultural exchange program
- Assisted exchange students in adapting to Korean culture and campus life, organizing welcoming dinners

Teaching

SKKU International Mentoring - Computer Networks Suwon, South Korea

Teaching Mentor March 2024 – June 2024

- Conducted weekly mentoring sessions for international students enrolled in the *Computer Networks* course, taking questions and assisting with assignments and projects
- Recognized with the *Outstanding Mentor Award* for exceptional performance

Honors & Awards

Outstanding Mentor Award, SKKU Spring 2024
Best Project Award, ECE 361E 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