

# Hun Tae Kim

<https://ht0324.github.io>

## RESEARCH INTEREST

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

## EDUCATION

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### **Sungkyunkwan University (SKKU)**

*B.S. in Computer Science and Engineering*

Seoul, South Korea

Mar 2019 – Feb 2025

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

### **The University of Texas at Austin (UT Austin)**

*Exchange Student, Electrical and Computer Engineering*

Austin, TX, USA

Aug 2022 – May 2023

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

## RESEARCH EXPERIENCE

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### **Human Language Intelligence Lab, SKKU**

*Undergraduate Research Assistant (Advisor: Prof. JinYeong Bak)*

Suwon, South Korea

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**

*Undergraduate Research Assistant (Advisor: Prof. Radu Marculescu)*

Austin, TX, USA

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

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### **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

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### **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

- 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

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### SKKU Whiteboard

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

### AI Assisted Mental Health Diary Analyzer

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

### Edge AI Model Compression and Optimization

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

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### 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 Intersivity 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

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### 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

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**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

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**Programming Languages:** Python, C/C++, Java, SQL

**Machine Learning & Data Science:** PyTorch, TensorFlow, ONNX, Scikit-Learn, Matplotlib

**Other:** LaTeX, Git, Shell, Docker