Taeyoung Yeon

Post-Baccalaureate Research Fellow

Northwestern University, Evanston, IL

taeyoungyeon@northwestern.edu • taeyoungyeon.github.io

Research Interests

Human-Computer Interaction, Privacy-Preserving Mobile Computing, On-Device AI, Human Activity Recognition

Education

Seoul National University March 2017 - February 2024
Bachelor of Science in Computer Science and Engineering *Seoul, South Korea*
Overall GPA: 3.53/4.00, *Graduated **cum laude***

Publications

1. **Taeyoung Yeon**, Vasco Xu, Hank Hoffman, Karan Ahuja. **WatchHAR: Real-time On-device Human Activity Recognition System for Smartwatches.** *Proceedings of the 27th ACM International Conference on Multimodal Interaction (ICMI '25).* 2025.

- Led the project as the sole first author, developing a comprehensive on-device activity recognition system
- Developed a real-time multimodal sensing system for human activity recognition on Apple Watch Series 7, utilizing audio and inertial measurement unit sensors
- Optimized audio processing pipeline by integrating a GPU-based log-mel spectrogram preprocessor with a MobileNetV3 backbone, enabling real-time inference at 20Hz
- Applied advanced model optimization techniques to achieve $25\times$ performance acceleration while reducing model size by $10\times$, maintaining over 90% classification accuracy

Research Experience

Post-Baccalaureate Research Fellow September 2024 - Present
Northwestern University, SPICE Lab, advised by Prof. Karan Ahuja *Evanston, IL*

- Conducting research on human activity sensing, machine learning, and on-device AI systems
- Established laboratory infrastructure and managed GPU computing resources, including network-attached storage and server systems
- Developing scalable infrastructure for large-scale dataset collection and inertial sensor-based navigation systems

Research Assistant (Remote Collaboration) April 2025 - Present
Carnegie Mellon University, SMASH Lab, advised by Prof. Mayank Goel *Remote*

- Focusing on tracking procedural tasks using on-device sensing on smartwatches
- Exploring effective model architecture to handle temporal information from Human Activities

Research Assistant August 2023 - January 2024
Human-Centered Computer Systems Lab, advised by Prof. Youngki Lee *Seoul National University*

- Developed systems for efficiently displaying user status during virtual reality meetings
- Created prototype VR meeting application and designed comprehensive user studies

Research Intern March 2023 - February 2024
Human-Computer Interaction Lab, advised by Prof. Jinwook Seo *Seoul National University*

- Served as Student Volunteer at IEEE PacificVis 2023 Conference
- Participated in research analyzing effective visualization techniques in pre-recorded online lectures

Research Assistant July 2023 - August 2023
Real-Time Ubiquitous Systems Lab, advised by Prof. Chang-Gun Lee *Seoul National University*

- Developed AI models for mental health diagnosis based on learning behavior patterns
- Debugged and optimized React Native Android applications using Android Studio
- Analyzed experimental data and trained machine learning models using TensorFlow

Professional Experience

Full Stack Game Developer (Alternative Military Service)   September 2019 - February 2023
Awesomepiece   *Seoul, South Korea*

- Managed live game services as part of Alternative Military Service obligation
- Developed in-game content and managed server infrastructure for large-scale multiplayer games
- Promoted to Development Team Leader in recognition of outstanding performance and leadership

CUDA Engineer Intern   July 2019 - August 2019
MindsLab   *Pangyo, South Korea*

- Achieved significant speed improvements in Tacotron 2 text-to-speech module using CUDA Multi-Process Service
- Developed Python-based profiling tools to assess and optimize deep learning model performance

Technical Skills

Programming Languages: Python, Java, C#, JavaScript, Kotlin, Swift, CUDA
Machine Learning: TensorFlow, PyTorch, CoreML, scikit-learn, model optimization
Mobile & VR Development: Unity (Meta SDK), iOS/Android development, cross-platform frameworks
Backend & Infrastructure: Spring Boot, Netty, Django, React, MySQL, Google Cloud Platform

Honors & Awards

Seoul National University Academic Excellence Scholarship   2017 - 2023
Merit-based academic scholarship awarded for consistently high academic performance

Language Proficiency

Korean: Native proficiency
English: Professional working proficiency
TOEFL iBT 106 (Reading: 29, Listening: 26, Speaking: 23, Writing: 28) - November 2024