SEUNGJOO LEE

Email: seungjoo.lee@kaist.ac.kr | Website: sjlee.info

EDUCATION

KAIST (Korea Advanced Institute of Science and Technology) Sep 2022 - Aug 2024(Expected)
M.S. in Electrical Engineering Total GPA : 4.15/4.3
Advised by Prof. Sung-Ju Lee

KAIST (Korea Advanced Institute of Science and Technology) Mar 2016 - Aug 2022
B.S. in Computer Science major Major GPA : 4.13/4.3 — Total GPA : 4.0/4.3
Graduated with Honors (2nd place)

Major Courses
Machine Learning – Advanced big data-AI integration, Speech Recognition systems (ongoing), Sensor data science, Advances in Convolutional Neural Networks, Big data analytics using R, Deep learning for NLP, Bias and ethics in NLP, Reinforcement learning, Computer vision

System – Mobile computing and applications, Operating system(Undergraduate, Graduate), Parallel computing, Computer networks, Computer organization(Undergraduate, Graduate)

PUBLICATIONS

[P1] FedTherapist: Mental Health Monitoring with User-Generated Linguistic Expressions on Smartphones via Federated Learning
Jaemin Shin, Hyungjun Yoon, **Seungjoo Lee**, Sungjoon Park, Yunxin Liu, Jinho D. Choi, Sung-Ju Lee
EMNLP 2023 | paper | project website

[P2] MyDJ: Sensing Food Intakes with an Attachable on Your Eyeglass Frame
Jaemin Shin, **Seungjoo Lee**, Taesik Gong, Hyungjun Yoon, Hyunchul Roh, Andrea Bianchi, Sung-Ju Lee
CHI 2022, **Honorable mention award** (top 5%) | paper | project website | video | slides

[P3] Accurate Eating Detection on a Daily Wearable Necklace (Demo)
Jaemin Shin, **Seungjoo Lee**, Sung-Ju Lee
Mobisys 2019 Demo
Held poster presentation and demonstration at the conference

[P4] High School Arduino
Book written by SADA (embedded software club), published by Jpub | Book introduction
Chapter 4, 7, and 13 are written by me

RESEARCH EXPERIENCES

Unlabeled Federated Learning via Programmatic Weak Supervision Nov 2022 - Present
Graduate student at NMSL, advised by Prof. Sung-Ju Lee
Mitigating the label deficiency problem of FL for its practical applications

UWB-Based Personal Mobility Warning System for Pedestrians Feb 2023 - Present
Graduate student at NMSL, advised by Prof. Sung-Ju Lee
UWB-based sensing of approaching Personal Mobility (PM) and warning pedestrians to prevent collision

Smartphone-Based Early Depression Diagnosis with a User's Daily Linguistic Expressions via Federated Learning [P1] Nov 2021 - Oct 2023
Undergraduate research intern at NMSL, advised by Prof. Sung-Ju Lee

Implemented federated learning framework with pytorch. Experimented preprocessing long input for LLMs. Reproduced existing paper to handle clients with only positive label, and tested the performance with various dataset (FeMNIST, CIFAR10, Human activity recognition). Pre-training LLMs with large corpus (BERT, RoBERTa) and distillation of pre-trained model into small models (DistilBERT). Did the experiments about resource efficiency (computation, memory, battery) on various mobile devices. Contributed to writing.

Sensing Food Intakes with an Attachable on Your Eyeglass Frame [P2, P3] Dec 2018 - Nov 2021
Undergraduate research intern at NMSL, advised by Prof. Sung-Ju Lee
Contributed the whole research process; problem definition, implementation, user study, and writing

Optimizing TLB Shootdown Mar 2018 - Jun 2018
Individual research at CALAB, advised by Prof. Jaehyuk Huh
Analysis of linux kernel using cscope, ctags and ftrace
Analysis of unnecessary TLB shootdowns using ftrace and systemtap

WORK EXPERIENCES

Internship at Samsung Electronics Jul 2021 - Aug 2021
MX (mobile experience) division, AI server development team
Developing RESTful server using Spring boot
Selected as the **best project** in the division

Won **first place** in team Creathon project
Presenting a new business item that Samsung can do
Suggested a new business idea

Internship at SK Hynix Dec 2017 - Jan 2018
NAND development branch, Solution algorithm division
Optimizing NAND-simulation program
Selected as the **best project** in the branch

AWARDS & HONORS

Winner of the Graduate of the Year Award (KAIST Board of Trustee Chairpeson's Prize)
Feb 2023
2nd place out of 715 students, awarded to top 5 students (0.7%) who demonstrated outstanding performances in various activities as well as in grades. Awarded at the commencement ceremony

KAIST Summa Cum Laude Sep 2022
Awarded for achieving the highest academic performance among students

Engineering Innovator Award Sep 2022
Awarded to students showing outstanding performance in extracurricular activities, including academic publications, entrepreneurial activities, exhibitions, and inventions
Five students are picked from college of engineering each semester

Honorable Mention Award Mar 2022
Awarded to top 5% of all submissions in CHI 2022

U.S. Army Certificate of Appreciation Jul 2021
Awarded for exemplary service during military duty, serving as a role model for others

Dean's List Spring 2019, Fall 2019
Awarded to top 3% among 2,900+ students in College of Engineering

National Excellence Scholarship Fall 2018 - Fall 2019
National scholarship to students who showed excellence

PROJECTS

Will Overly Polite Sentences Harm Model Performance? Adversarial Pragmatic Perturbation for NLP
Team Project website — Mar 2023 - Jun 2023
Adversarial attack on LLM model with tone perturbation and its defense

Validating Labeling Functions in Domain Shift (Out of Domain detection)
Team Project website — Sep 2022 - Dec 2022
Domain shift detection using programmatic weak supervision

Context-Aware Automatic Video Screen Manipulation Using Trajectory Tracking
Team Project website | video — Sep 2021 - Dec 2021
Manipulating Youtube (rotate, zoom, relay from smartphone to laptop) using user head location & orientation
Implemented head tracking using Arduino & bluetooth connection between laptop, smartphone, and Arduino

DeltaCNN: Efficient Processing of CNN Inference for Continuous Mobile Vision
Team Project website — Sep 2019 - Dec 2019
Fast calculation of convolutional layers in continuous video streams using the fact that the video scene does not change significantly

GraspTraker: Tracking Smartphone Grab Posture with Inaudible Sound
Team Project website — Sep 2019 - Dec 2019
Detecting smartphone grasp posture using inaudible sound

SPADE-based Line Art Colorization — Sep 2019 - Dec 2019
Team Project website
SPADE-based model that colorizes a given line art image using a hint image

Pintos
Team Project — Mar 2019 - Jun 2019
Implemented 4 sub-projects of pintos (threads, user programs, virtual memory, file system) with perfect score

TEACHING EXPERIENCES

Computer Network (EE323) — Spring 2024
Head of teaching assistants (Prof. Sung-Ju Lee)

Operating Systems and System Programming for Electrical Engineering (EE415) — Fall 2023
Teaching assistant (Prof. Sung-Ju Lee)

Programming Structures for Electrical Engineering (EE209) — Spring 2023
Teaching assistant (Prof. Sung-Ju Lee)

Volunteered for Educational Support for Students in Difficult Circumstances — Mar 2020 - Jun 2021
Taught math and science to 4 middle school students for 2 hours every week (total ∼136 hours)

Mentor for the Gifted Education Program, SW/AI Camp — Summer 2022
Facilitated a 2-night, 3-day program for elementary and middle school students, focusing on creating SW/AI-related kits, providing career mentoring, and conducting quizzes

CS101 tutor — Spring 2017, Fall 2017, Spring 2022
Taught 5 freshman studying CS101 (introduction to programming)

MENTORING EXPERIENCES

Thanh Long Le Viet — Oct 2023 - Present
Undergraduate research intern at NMSL
Doing a research project about *unlabeled federated learning* together

ACADEMIC SERVICES

Reviewer, ACM IMWUT/UbiComp Nov 2022

EXTRA-CURRICULAR ACTIVITIES

KATUSA (Korean Augmentation to the U.S. Army) Dec 2019 - Jun 2021
Served national service at eighth army as a KATUSA
Provided translation between the U.S. and Korean army

International Students Organization (ISO) Sep 2016 - Dec 2019
Introduce Korean culture to international students

Embedded Software Club Mar 2014 - Dec 2015
Been a leader for a year
Published book about doing scientific experiments using Arduino

SKILLS

Computer Skills

Languages	C/C++, Python, Kotlin, Java
Platforms/Frameworks	Android, Pytorch, Tensorflow, Spring boot, Arduino
Video Softwares	Vegas, AfterEffect, Premier

Languages
Fluent in English and Korean
TOEIC 955 (Tested in 2022)