

# SEUNGJOO LEE

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## RESEARCH INTERESTS

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Machine Learning for Healthcare, Mobile Sensing, Federated Learning, Large Language Model

## EDUCATION

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**Carnegie Mellon University** Aug 2025 - Present  
Ph.D. in Societal Computing  
Advised by [Mayank Goel](#) & [Justin Chan](#)

**KAIST (Korea Advanced Institute of Science and Technology)** Sep 2024 - Jul 2025  
Ph.D. in Electrical Engineering (Transferred to Carnegie Mellon University)  
Advised by [Sung-Ju Lee](#)

**KAIST (Korea Advanced Institute of Science and Technology)** Sep 2022 - Aug 2024  
M.S. in Electrical Engineering  
GPA : 4.17/4.3  
Advised by [Sung-Ju Lee](#)

**KAIST (Korea Advanced Institute of Science and Technology)** Mar 2016 - Aug 2022  
B.S. in Computer Science  
Major GPA : 4.13/4.3 | Total GPA : 4.0/4.3  
🏆 Graduated with Honors (2nd place out of 715 students)  
🏆 Summa Cum Laude  
\* Including 1.5 years of mandatory military service

## PUBLICATIONS

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(C: Conference, D: Demo, W: Workshop, B: Book, U: Under Review)

\* Equal contribution. † Equal senior role

### [U1] Anonymized Title

XiaoMeng Chen\*, **Seungjoo Lee**\*, Hyungjun Yoon\*, Yu Wu\*, Taiting Lu, Freddy Yifei Liu, Sung-Ju Lee†, Dongyao Chen†, Cecilia Mascolo†, Lili Qiu  
Conference on Neural Information Processing Systems (**NeurIPS**) 2025

### [C3] (FL)<sup>2</sup>: Overcoming Few Labels in Federated Semi-Supervised Learning

**Seungjoo Lee**, Thanh-Long V. Le, Jaemin Shin, Sung-Ju Lee  
Conference on Neural Information Processing Systems (**NeurIPS**) 2024  
Top ML Conference - Acceptance rate 25.8%

### [C2] 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  
Conference on Empirical Methods in Natural Language Processing (**EMNLP Main**) 2023  
Top NLP Conference - Acceptance rate 21.3%

### [C1] 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  
Conference on Human Factors in Computing Systems (**CHI**) 2022  
🏆 Best Paper Honorable mention award (top 5%)  
Top HCI Conference - Acceptance rate 24.7%

- [W1] **CrashSniffer: UWB-Based Anchor-Free Pedestrian Collision Prediction for Personal Mobility Vehicles**  
 Taeckyoung Lee, Juseung Lee, Ryuhaerang Choi, **Seungjoo Lee**, Hyeongheon Cha, Hyungjun Yoon, Song Min Kim, Sangwook Bak, Sung-Ju Lee  
 MobiSys Workshops (**EnvSys**) 2025
- [D1] **Accurate Eating Detection on a Daily Wearable Necklace (Demo)**  
 Jaemin Shin, **Seungjoo Lee**, Sung-Ju Lee  
 International Conference on Mobile Systems, Applications and Services (**MobiSys**) 2019
- [B1] **High School Arduino**  
 Comprehensive guide on conducting scientific experiments using Arduino  
 Chapter 4, 7, and 13 are written by me

## RESEARCH EXPERIENCE

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**Microsoft Research Asia** Sep 2024 - Present  
*Research Intern*, Advised by [Lili Qiu](#)  
 Wearable sensing for healthcare with EXG signal. Developing foundation model for EXG data.

**KAIST Network and Mobile Systems Lab** Dec 2018 - Present  
*Graduate Student & Undergraduate Research Intern*, Advised by [Sung-Ju Lee](#)

- **Federated Learning for Medical Applications (Lead)**  
 Addressing the costly labeling process in medical applications through weak supervision.
- **Federated Semi-Supervised Learning with Label Deficiency (Lead) [C3]**  
 Mitigating the label deficiency problem of federated semi-supervised learning for its practical applications.
- **Mental Health Monitoring with User-Generated Linguistic Expressions on Smartphones via Federated Learning [C2]**  
 Contributed to methodology development. Implemented federated learning framework. Experimented handling long input for LLMs. Reproduced existing paper to handle clients with only positive label. Pre-training LLMs with large corpus and distillation of pre-trained model into small models. Did the experiments about resource efficiency (computation, memory, battery) on various mobile devices.
- **Sensing Food Intakes with an Attachable on Your Eyeglass Frame [C1, D1]**  
 Designing a novel wearable device that can be easily attached to eyeglass frames, capable of eating detection. Contributed the whole research process; problem definition, implementation, and user study.
- **Enhancing Visual LLM Reasoning Capability**  
 Advancing multi-hop visual LLM reasoning via dynamic input adjustments during inference.
- **UWB-Based Personal Mobility Warning System for Pedestrians**  
 UWB-based sensing of approaching Personal Mobility (PM) and warning pedestrians to prevent collision.

**KAIST Computer Architecture & Systems Lab** Mar 2018 - Jun 2018  
*Individual Research*, Advised by [Jaehyuk Huh](#)  
 Worked on optimizing TLB shutdown by conducting an in-depth analysis of the Linux kernel with cscope, ctags, and ftrace. Investigated and identified unnecessary TLB shutdowns using ftrace and systemtap.

## AWARDS & HONORS

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**CHI 2022 Honorable Mention Award** Mar 2022  
 Awarded to top 5% of all submissions in CHI 2022 [C1].

**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.

**Summa Cum Laude**

Sep 2022

Awarded for achieving the highest academic performance among students.

**Dean's List**

Spring 2019, Fall 2019

Awarded to top 3% among 2,900+ students in College of Engineering.

**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 (2,900+) each semester.

**KAIST Breakthroughs**

Spring 2023

Featured in biannual KAIST webzine showcasing groundbreaking works [C2].

**U.S. Army Certificate of Appreciation**

Jul 2021

Awarded for exemplary service during military duty, serving as a role model for others.

**National Excellence Scholarship**

Fall 2018 - Fall 2019

National scholarship to students who showed excellence.

**Samsung Humantech Paper Award**

Spring 2015

Fourth prize on "An optimal path of navigation based on fractal dimension".

**INVITED TALKS****MSRA Intern Tech Talk, MSRA**

Nov 2024

Overcoming Few Labels in Federated Semi-Supervised Learning

**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)

**MENTORING EXPERIENCES****Seoyoung Park**

Jun 2024 - Oct 2024

Undergraduate research intern at [NMSL](#)

Doing a research project about *federated learning* together

**Thanh Long Le Viet**

Oct 2023 - May 2024

Undergraduate research intern at [NMSL](#)

Doing a research project about *federated learning* together

**Rachel Kim**

Dec 2023 - Feb 2024

Undergraduate research intern at [NMSL](#)

Doing a research project about *UWB-based personal mobility warning system for pedestrians* together

**ACADEMIC SERVICES****Conference Reviewer**

- Conference on Neural Information Processing Systems (**NeurIPS**), 2025
- International Conference on Mobile Systems, Applications, and Services (**MobiSys**), 2023-2025
- International Conference On Mobile Computing And Networking (**MobiCom**), 2023-2025

- Special Interest Group on Data Communication (**SIGCOMM**), 2023
- International Joint Conference on Pervasive and Ubiquitous Computing (**UbiComp**), 2022

## Outreach

- **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)

## WORK EXPERIENCES

- Internship at Samsung Electronics** Jul 2021 - Aug 2021  
*MX (Mobile Experience) division, AI server development team*
- Developing RESTful server using Spring boot. Gained hands-on experience in the entire server development process in a professional setting, including designing server APIs and implementing CI/CD pipelines. Selected as the **best project** in the division
  - Presenting a new business item for Samsung, which was about developing kiosk for elderly people. Won **first place** in team Creathon project
- Internship at SK Hynix** Dec 2017 - Jan 2018  
*NAND development branch, Solution algorithm division*
- Optimizing NAND-simulation program. Achieved 66% performance boost over existing code. Selected as the **best project** in the branch

## PATENTS

- [P3] "Adaptive State-Space Model-Based Deep Learning System for Real-Time Data Inference on Mobile Devices", Sung-Ju Lee, Seungjoo Lee, HyungJun Yoon, Korea patent (In progress)
- [P2] "System and Method for Monitoring Mental Health Based on Smartphone User Language Expressions Through Federated Learning", Sung-Ju Lee, HyungJun Yoon, Seungjoo Lee, Jaemin Shin, Korea patent (Filing date: 2024.10.04, No. 10-2024-0135031)
- [P1] "Artificial Intelligence Model Training Method and Apparatus for Voice Phishing Detection", Sung-Ju Lee, Seungjoo Lee, HyungJun Yoon, Korea patent (Filing date: 2023.10.04, No. 10-2023-0131748)

## MILITARY SERVICE

- KATUSA (Korean Augmentation to the U.S. Army)** Dec 2019 - Jun 2021  
Served national service at eighth army as a KATUSA, providing translation between the U.S. and Korean army. Selected to participate as a Korean military interpreter in the EIB (Expert Infantryman Badge) contest, the U.S. Army's prestigious competition.

## EXTRA-CURRICULAR ACTIVITIES

- International Students Organization (ISO)** Sep 2016 - Dec 2019  
Introduce Korean culture to international students.
- Flute Player in Cantabile (Orchestra)** Mar 2014 - Jan 2016
- Embedded Software Club** Mar 2014 - Dec 2015  
Been a club leader for a year. Published book about doing scientific experiments using Arduino [B1].