

Catherine Hae Seung Jeon

[Google Scholar](#) – [GitHub](#) – [LinkedIn](#) – [Website](#)

RESEARCH INTERESTS

- † **Robust Deep Learning**
 - Noise/Out-of-distribution Robustness, Data Augmentation
- † **Efficient Deep Learning**
 - Continual Learning, Few-shot Learning, Data-Efficient Learning
- † **Representation Learning**
 - Contrastive Learning, Metric Learning, Feature Embedding Networks
- † **AI for Social Good**
 - AI for Healthcare, AI for Science, AI for Security

EDUCATION

Ewha Womans University	<i>M.S. in Computer Science & Engineering (Advisor: Prof. S.E. Oh)</i>	<i>09/2024 – 08/2026 (Expected)</i> Seoul, South Korea
	• GPA: overall 4.25/4.30	

Ewha Womans University	<i>B.S. in Computer Science & Engineering</i>	<i>03/2020 – 08/2024</i> Seoul, South Korea
	• GPA: overall 4.15/4.30	

PUBLICATIONS

Conference Publications

Hwang, C.*, **Jeon, Haeseung***, Hong, J., Kang, H., Mathews, N., Kim, G. & Oh, S.E. (2025). “Enhancing Search Privacy on Tor: Advanced Deep Keyword Fingerprinting Attacks and BurstGuard Defense.” In *Proceedings of the 20th ACM Asia Conference on Computer and Communications Security (ASIACCS)*.  [CORE A, Acceptance Rate = 19%]

Hwang, C.*, **Jeon, Haeseung***, Kim, G., Hong, J., Kang, H., & Oh, S.E. (2024). “DKF: Employing Deep Learning for Keyword Fingerprinting Attacks on Tor.” In *Proceedings of the Korea Computer Congress (KCC)*. [Short Paper]  [Distinguished Paper Award]

Workshop/Poster Publications

Jeon, Haeseung, Hong, J., Hong, S., Kang, H., Kim, B., Oh, S. E., & Kim, N. (2025). “Domain-Adapted Automatic Speech Recognition with Deep Neural Networks for Enhanced Speech Intelligibility Prediction.” In *Proceedings of the 6th Clarity Workshop on Improving Speech-in-Noise for Hearing Devices (INTERSPEECH Workshop)*. [Short Paper]  [CPC3 Top 5]

Hwang, C*, **Jeon, Haeseung***, Kim, G., Hong, J., Kang, H., & Oh, S.E. (2024). “Securing Search Privacy on Tor: Deep Keyword Fingerprinting and BurstGuard Defense.” Presented at the *40th Annual Computer Security Applications Conference (ACSAC)*. [Poster] 

Under-Review Journal/Conference Publications

Jeon, Haeseung*, Kim, S.*, Mathews, N., Kang, H., & Oh, S.E. (2025). “RoFiRe: Robust Website Fingerprinting on Real-World Tor Traffic via Improved Augmentation and Normalization.” Under review at the *2026 ACM Web Conference (WWW)*.

Park, J., **Jeon, Haeseung**, Ji, A., Piplai, A., Rahman, M. S., & Oh, S.E. (2025). “TabCL: Continual Malware Classification with Tabular-Aware Generation.” Under review at the *30th Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD)*.

Kim, N., Chen, M., **Jeon, Haeseung**, Nakamura, K. A., & Bai, M. R. (2025). “Toward Speaker Coil Impedance-Based Sensing: Acoustic Load Analysis Using Deep Learning.” Under review at the *IEEE Transactions on Instrumentation and Measurement (TIM)*.

Kim, N., Nakamura, K., Chen, M., **Jeon, Catherine Hae Seung**, & Bai, M. R. (2025). “Speakers as Sensors: Artificial Intelligence-Powered Impedance-Based Acoustic Load Analysis.” Under review at the *Journal of the Acoustical Society of America (JASA)*.

*Equally contributing authors, listed in alphabetical order.

RESEARCH EXPERIENCE

Ewha Womans University | AI Security Lab
Graduate Research Assistant (Advisor: Prof. S.E. Oh)

09/2024 – Present
Seoul, South Korea

- Proposed a robust few-shot learning model with an LLM-inspired component (pre-norm, RM-SNorm) and a window-based heterogeneous augmentation method in collaboration with RIT. Outperformed previous SOTA, a SimCLR-based contrastive learning model, by up to 12% across n-shot, concept drift, and open-set recognition tasks without large-scale pre-training.
- Leading advanced time-series embedding model development, such as metric learning models and FENs, in collaboration with the University of Edinburgh and the U.S. NRL.

Purdue University | Sensor, Electro-Acoustics Technology Lab 05/2025 – Present
Part-Time Researcher (Research Advisor: Prof. N. Kim) Indiana, United States

- Directed the development of a speech clarity prediction model to support hearing aid users. Suggested a two-phase model by fine-tuning an ASR backbone on speech-in-noise audio and masked text to simulate inaudibility, and stacking Transformer encoders for clarity prediction.
- Enhanced the CNN acoustic load prediction model that uses a speaker impedance as a feature. Achieved near-perfect accuracy across four different speakers, demonstrating the potential of DL as an effective and efficient diagnostic tool.

UTEP | Intelligent and Quantum Secure Advanced Cyber Defense Lab 06/2025 – 08/2025
Visiting Researcher (Research Advisor: Prof. M.S. Rahman) Texas, United States

- Built a continual learning (CL) framework with a conditional tabular GAN and improved storage/training efficiency by generative replay (GR). Drove experiments and achieved up to 16% improvements over the baselines (GAN and TVAE) in Class-IL/Time-IL scenarios.

Ewha Womans University | AI Security Lab 01/2023 – 08/2024
Undergraduate Research Assistant (Research Advisor: Prof. S.E. Oh) Seoul, South Korea

- Led research on the first DL-based fingerprinting model for network traffic, achieving a 41-55% improvement over a previous SOTA. Built a Selenium crawler to collect 300K+ fresh samples over 1+ years, profiled unique data patterns, and benchmarked ML baselines (Random Forest and SVM) on the new datasets.

PROJECTS

Seoul National University | THUNDER Research Group 02/2025
Accelerator Programming Bootcamp Participant GitHub

- Led re-implementation of the CPU-based MoE model with custom CUDA kernels to enable GPU-based parallelism. Analyzed bottlenecks using Nsight Systems, applied advanced optimization techniques such as CUDA streams, kernel fusion, and warp occupancy optimization.
- Achieved a $650\times$ throughput improvement and a 3rd place award in the competition.

INDUSTRY EXPERIENCE

Samyang Data Systems Inc. | Cloud Solutions Team 03/2023 – 06/2023
Cloud Engineer Intern Seoul, South Korea

- Implemented a Golang monitoring agent and E2E pipeline that collects, stores, and visualizes real-time metrics from AWS infrastructure by utilizing InfluxDB and Grafana. Deployed agents to 10+ client servers, ensuring software reliability through stress tests.

TEACHING EXPERIENCE

Ewha Womans University | Computer Algorithms SP 2025
Teaching Assistant Seoul, South Korea

AWARDS & SCHOLARSHIPS

EWU Research Assistant Scholarship – <i>half-tuition</i>	FA 2024
EWU Outstanding Ewha Scientist Admissions Scholarship – <i>half-tuition for 2 years</i>	FA 2024 – Present
Korea Computer Congress Distinguished Paper Award (top 6%)	SP 2024
EWU National Program of Excellence in Software Scholarship – KRW ₩1M	SP 2024
Huawei ICT Talent Development Scholarship – KRW ₩1M	FA 2023
EWU Excellence Honors Scholarship (top 6%) – <i>quarter-tuition</i>	FA 2023
EWU Highest Honors Scholarship (top 2%) – <i>half-tuition</i>	FA 2020, SP 2022, SP 2023
EWU W4 Admissions Scholarship (top entrant) – <i>full-tuition for 4 years</i>	SP 2020 – SP 2024

COMMUNITY ENGAGEMENT

EWU CS Undergraduate Lab Pair, Invited Speaker	09/2025
UTEP CS Summer Research Symposium, Invited Speaker	08/2025
EWU CS Undergraduate Open Lab Seminar, Invited Speaker	03/2025
EWU Undergraduate Peer Tutoring Program, Lecturer	06/2022, 06/2024
GDSC Devfest π 2024: Responsible AI in action, Invited Speaker	03/2024
GDSC Devfest Cloud 2023, Organizer	12/2023
AWS Cloud Club (ACC), Cloud Team Executive	09/2023 – 08/2024
Google Developer Student Clubs (GDSC), Backend Team Executive	09/2022 – 07/2024