

# Catherine Hae Seung Jeon

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## 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

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

  

<b>Ewha Womans University</b>	<i>B.S. in Computer Science &amp; Engineering</i>	03/2020 – 08/2024 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 for speech-in-noise signals to support hearing aid users. Suggested and implemented fine-tuning an ASR model with masked transcription and training an E2E Transformer model for a clarity prediction task.
- 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 $\pi$ 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