# Jae-Won **Chung**

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## Summary

I am a fifth year PhD candidate in CSE at the University of Michigan, advised by Professor Mosharaf Chowdhury. I build **efficient software systems for deep learning**, with a recent focus on the efficient management of not only time, but also **energy**. My research views energy as a first-class systems resource that is worth carefully optimizing and allocating based on precise measurement and understanding.

I am passionate about **open-source** software and making real-world impact with my research. My open-source works, including the Zeus library, have received wide recognition from academia and industry from for instance Google, PyTorch Foundation, and GitHub. I created and lead the ML.ENERGY initiative as part of my research and open-source efforts, which is now a cross-institutional effort.

## Education

**University of Michigan**                                                                                                          *Ann Arbor, MI, USA*
Ph.D. candidate in Computer Science and Engineering                                                        *Sep 2021 - present*

**University of Michigan**                                                                                                          *Ann Arbor, MI, USA*
M.S. in Computer Science and Engineering                                                                        *Sep 2021 - Apr 2023*

**Seoul National University**                                                                                                        *Seoul, South Korea*
B.S. in Electrical and Computer Engineering                                                                        *Mar 2015 - Aug 2021*

- GPA: 4.04/4.3 (overall) 4.15/4.3 (major), Summa Cum Laude. Period includes two years of military service.

## Publications

### Peer-reviewed conference publications                                                              * Equal contribution

- **The ML.ENERGY Benchmark: Toward Automated Inference Energy Measurement and Optimization,** Jae-Won Chung, Jeff J. Ma, Ruofan Wu, Jiachen Liu, Oh Jun Kweon, Yuxuan Xia, Zhiyu Wu, Mosharaf Chowdhury, **NeurIPS Datasets & Benchmarks track (spotlight)**, 2025 (Spotlight acceptance rate = 2.81%)

- **Reducing Energy Bloat in Large Model Training,** Jae-Won Chung, Yile Gu, Insu Jang, Luoxi Meng, Nikhil Bansal, Mosharaf Chowdhury, **SOSP**, 2024 (Acceptance rate = 17.34%)

- **Zeus: Understanding and Optimizing GPU Energy Consumption of DNN Training,** Jie You*, Jae-Won Chung*, Mosharaf Chowdhury, **NSDI**, 2023 (Acceptance rate = 18.38%)

- **ShadowTutor: Distributed Partial Distillation for Mobile Video DNN Inference,** Jae-Won Chung, Jae-Yun Kim, Soo-Mook Moon, International Conference on Parallel Processing (**ICPP**), 2020 (Acceptance rate = 28.99%)

### Preprints and workshop publications

- **Cornserve: Efficiently Serving Any-to-Any Multimodal Models,** Jeff J. Ma*, Jae-Won Chung*, Akshay Jajoo, Myungjin Lee, Mosharaf Chowdhury, Preprint, 2025

- **Toward Cross-Layer Energy Optimizations in AI Systems,** Jae-Won Chung, Nishil Talati, Mosharaf Chowdhury, **DOE ASCR Energy-Efficient Computing for Science Workshop**, 2024

- **Andes: Defining and Enhancing Quality-of-Experience in LLM-Based Text Streaming Services,** Jiachen Liu, Jae-Won Chung, Zhiyu Wu, Fan Lai, Myungjin Lee, Mosharaf Chowdhury, Preprint, 2024

- **Chasing Low-Carbon Electricity for Practical and Sustainable DNN Training,** Zhenning Yang, Luoxi Meng, Jae-Won Chung, Mosharaf Chowdhury, **ICLR Workshop**: Tackling Climate Change with Machine Learning, 2023

# Open Source Projects

- **Zeus** (☆329 ⑂ 40), <u>A framework for deep learning energy measurement and optimization.</u> **PyTorch ecosystem project.** Provides a unified abstraction over various CPU, GPU, and SoC vendors, and an array of time & energy optimizers.
- **Cornserve** (☆95 ⑂ 6), <u>An efficient serving platform for any-to-any multimodal models.</u> Takes a microservice approach to serving complex-structured multimodal input & output models.
- **BERT4Rec-VAE-Pytorch** (☆408 ⑂ 95), <u>A PyTorch framework for recommendation model training</u>, with abstract classes for pluggable model, dataset, and samplers. BERT4Rec and Netflix VAE models implemented.
- **Reason** (☆195 ⑂ 4), <u>A shell for managing research papers, written in Rust.</u> Supports importing papers from file and URL, attaching markdown notes, and creating an HTML book with notes. Uses `serde` to persist data in human-readable and cloud sync-friendly format.
- **Pegasus** (☆32 ⑂ 3), <u>An SSH command runner with a focus on simplicity, written in Rust.</u> Runs multiple commands asynchronously using the `tokio` runtime and streams stdout and stderr back to the user. Battle-tested through multiple research projects and benchmarking.

*Number of stars and forks are up-to-date as of January 18th, 2026.*

# Honors & Awards

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|---|---|---|
| Nov 2025 | **Slingshot Grant,** $25,000 USD AWS Credits for the development of the <u>ML.ENERGY Initiative</u> | *Laude Institute* |
| Aug 2025 | **GitHub Secure Open Source Fund,** $10,000 for the development of the <u>Zeus</u> project | *GitHub* |
| May 2024 | **PyTorch Ecosystem Project,** <u>Zeus</u> was included in the PyTorch Ecosystem | *PyTorch Foundation* |
| Jan 2024 | **Research award,** $20,000 for the development of the <u>ML.ENERGY Initiative</u> | *Salesforce* |
| Jan 2024 | **Mozilla Technology Fund 2024,** $50,000 for the development of the <u>Zeus</u> project | *Mozilla* |
| Nov 2022 | **Carbon Hack '22 Second Best Solution,** <u>Carbon-Aware DNN Training with Zeus</u>, $25,000 | *Green Software Foundation* |
| Jul 2021 | **Kwanjeong Overseas Scholarship,** $25,000 | *Kwanjeong Educational Foundation* |
| Mar 2019 | **Kwanjeong Undergraduate Scholarship,** $20,000 over two years | *Kwanjeong Educational Foundation* |

# Talks

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|---|---|---|
| Dec 2025 | **Energy and Power as First-Class ML Design Metrics (w/ NVIDIA, Google, Meta)** | *NeurIPS 25 Tutorial* |
| Oct 2025 | **Energy as a First-Class ML Design Metric** | *UW–Madison MadSystems Seminar* |
| Sep 2025 | **Power and Energy as First-Class AI Design Metrics** | *KPAI (Bay Area Korean AI Meetup)* |
| Jun 2025 | **Energy as a First-Class Resource in Machine Learning Systems** | *Pruna AI* |
| May 2025 | **Energy-Efficient Systems for Machine Learning** | *<u>Harvard Power and AI Initiative</u>* |
| Nov 2024 | **Energy-Efficient Systems for Machine Learning** | *SOSP 24 Doctoral Workshop* |
| Apr 2024 | **Power and Energy Considerations in Machine Learning Systems** | *University of Michigan (EECS 598)* |
| Oct 2023 | **Energy-Efficient Software Systems for Machine Learning** | *Seoul National University* |
| Oct 2023 | **Energy-Efficient Deep Learning with PyTorch and Zeus** | *PyTorch Conference* |
| Sep 2023 | **Energy-Efficient Deep Learning with Zeus** | *Massachusetts Institute of Technology* |

# Selected Media Coverage

My research and open-source works have been covered by various media outlets, including MIT Technology Review, ArsTechnica, and Science News.

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|---|---|---|
| Jul 2025 | **How much energy does your AI prompt use? It depends.** | *Science News* |
| May 2025 | **We did the math on AI's energy footprint. Here's the story you haven't heard.** | *MIT Technology Review* |
| May 2025 | **AI Consumes Lots of Energy. Can It Ever Be Sustainable?** | *The New Stack* |
| Mar 2025 | **Can we make AI less power-hungry? These researchers are working on it.** | *ArsTechnica (front page)* |
| Nov 2024 | **Up to 30% of the power used to train AI is wasted: A software tool could help fix that.** | *Tech Xplore* |
| Apr 2023 | **University of Michigan's 'Zeus' Framework Downsizes AI's Massive Carbon Footprint.** | *HPCWire* |
| Apr 2023 | **Researchers claim they can cut AI training energy demands by 75%.** | *DatacenterDynamics* |

## Service

- **Ad-hoc reviewer,** Nature
- **Systems Reading Group Organizer,** Paper reading group inside Michigan CSE. Organizer from September 2022 to December 2025.

## Teaching

- **Systems for Generative AI (UMich, Fall 25),** GSI, three lectures on GenAI and GenAI systems fundamentals. **Instructor evaluation median 5.00 (highest possible)**. Written comments included phrases "excellent" (three times), "perfect," and "one of the best."
- **Operating Systems (SNU, Spring 21),** Lead TA, managed Linux kernel hacking projects and led student team design reviews.
- **Computer Architecture (SNU, Fall 20),** Peer tutor, provided 30 hours of online lecture. **Best Tutor Award**.