

# 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 measurements 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, including [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

PH.D. CANDIDATE IN COMPUTER SCIENCE AND ENGINEERING

Ann Arbor, MI, USA

Sep 2021 - present

### University of Michigan

M.S. IN COMPUTER SCIENCE AND ENGINEERING

Ann Arbor, MI, USA

Sep 2021 - Apr 2023

### Seoul National University

B.S. IN ELECTRICAL AND COMPUTER ENGINEERING

Seoul, South Korea

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%)

### Workshop publications and preprints

- **Cornserve: Efficiently Serving Any-to-Any Multimodal Models**, Jeff J. Ma\*, Jae-Won Chung\*, 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

## Honors & Awards

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

## Talks

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

## Selected Media Coverage

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

## Service

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- **Systems/Software Reading Group**, Paper reading group inside Michigan CSE, Organizer since Fall 2022

## Teaching

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- **CSE585: Systems for Generative AI (UMich, Fall 25)**, GSI, three lectures on GenAI and GenAI systems fundamentals.
- **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!**