Liuzixuan (Peter) Lin

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EDUCATION

The University of Chicago, Chicago, U.S.A 09/2019 – 12/2025
Ph.D. in Computer Science, Advisor: Prof. Andrew A. Chien
Awards: Crerar Fellowship (2019)

Peking University, Beijing, China 09/2015 – 07/2019
Bachelor of Science in Computer Science and Technology; Bachelor of Economics
Awards: Excellent Graduate (2019), Yang Fuqing & Wang Yangyuan Academician Scholarship (2018)

EXPERIENCE SUMMARY AND INTEREST

My PhD research focuses on sustainable cloud computing, and I have also done research in the industry on data center power management for cloud provider objectives (power efficiency, QoS, sustainability, etc.). Those works span cluster resource management, data center planning, and datacenter-grid coordination.

INTERNSHIP EXPERIENCE

Microsoft, Azure Research – Systems, Research Intern 06/2024 – 09/2024
- Designed data center power management approaches (server/VM-granularity) to minimize QoS impact in various types of power events.
- Supplemented and improved the data center simulator developed in 2022.

Microsoft, Systems Research – Redmond, Research Intern 06/2022 – 09/2022
- Major developer of a data center simulator that can replay datacenter traces and be used to test power management in different levels of data center hierarchy.
- Modeled grid demand response programs and designed data center response with IT power and UPS battery control.

RESEARCH EXPERIENCE

Zero-carbon Cloud (The University of Chicago) 2019.10 – now
- Explored improvements in data center infrastructure, resource management, and coordination with the power grid to reduce carbon emissions of data centers, improving sustainability of cloud computing.
- Led the design and development of a system that automates power grid data collection, processing, and derived carbon-related metrics computation. It also automates error detection and fixing to enhance robustness.

Geo-semantics Analysis of Social Media Text (Peking University) 2018.2 – 2019.5
- Use deep learning NLP methods to infer the topics (e.g. food, travel) and classify the sentiment of location-tagged microblogs. Developed a recommendation system based on the topic and sentiment results.

SELECTED PUBLICATIONS

Liuzixuan Lin and Andrew A. Chien. *Middlebox: Unlocking Datacenter Growth and Grid Decarbonization*. ACM SoCC 2025.
- Proposed a system architecture named "Middlebox", which decouples datacenter power capacity and grid load with energy resources to meet datacenter and grid needs concurrently. Grid-coupled simulation and TCO analysis demonstrate it can increase grid capacity for datacenters by 460%, with constant capacity on 99.9% of days at a cost of 3-5% increase in datacenter TCO.

Liuzixuan Lin and Andrew A. Chien. *Adapting Datacenter Capacity for Greener Datacenters and Grid*. ACM e-Energy 2023. (**Best Paper Runner-up**)
- Designed a coordination scheme between data centers and the grid: data centers create load plans adapted to grid carbon signals and share them with the grid. Simulation shows this reduces 12% of data center carbon emissions.

AA Chien, L Lin, H Nguyen, V Rao, T Sharma, R Wijayawardana. *Reducing the Carbon Impact of Generative AI Inference (today and in 2035).* ACM HotCarbon 2023.
- Characterized end-to-end latency of ChatGPT requests and designed a carbon-optimized load balancing algorithm that can reduce 35% of operational carbon emissions of generative AI inference.

SKILLS

Skills: system simulation and optimization, data analytics, applied machine learning, Web app development.
Programming languages: Python, C/C++, Julia.
Languages: Chinese (native), English (professional).