

# *Towards Building a Learning-Based Storage Ecosystem and Beyond*

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*Monday, March 3<sup>rd</sup>*

10:30 AM • MSEE 112

## **Abstract**

Abstract: Storage systems have evolved over decades into a complicated ecosystem that includes storage hardware, system software, and data applications. This growing complexity poses significant challenges for storage development and deployment. And current human-driven heuristic-based approaches to building storage systems cannot rapidly meet the ever-increasing storage performance and efficiency demands of applications. As we embrace the advancement of machine learning (ML) today, it is now the golden age to invent new approaches to develop and deploy storage systems with ML techniques.

In this talk, I will present my research on building a learning-based storage ecosystem. Specifically, I will demonstrate how we can explore ML to (1) automate and accelerate storage hardware development, (2) optimize the system software for improved memory efficiency and storage performance, and (3) manage the complexity of cloud storage deployment at scale. I will also discuss how my work would shed light on the development of “ML for systems” in general.

## **Bio**

Jinghan Sun is a final-year Ph.D. candidate in Computer Science at the University of Illinois Urbana-Champaign, advised by Prof. Jian Huang and Prof. Marc Snir. His research focuses on machine learning for systems using hardware-software co-design, with an emphasis on storage systems. His research has been published in top-tier venues such as OSDI, ASPLOS, MICRO, and SC, with industrial impact through collaborations with Microsoft, Google, and Western Digital. He is a recipient of the Kenichi Miura Award at UIUC and the NVMW Memorable Paper Award Finalist.

## **Hosts**

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