



Friday, March 7, 2025

11:15 am ITE 336

(Refreshments in ITE 301 at 11 am)

Scalable and Reliable System Design for Quantum Computing

Prof. Fan Chen

Quantum computing has the potential to solve classically intractable problems across diverse domains; however, current quantum systems face significant challenges in scalability and reliability across the entire system stack. In this talk, I will present our research group's efforts to address these challenges through advancements in architecture, algorithms, and compilation. First, I will discuss our distributed trapped-ion quantum system, which introduces architectural innovations to improve scalability and mitigate system bottlenecks. Next, I will highlight our robust variational quantum algorithm designs, developed to enhance reliability on noisy intermediate-scale quantum (NISQ) hardware. Finally, I will explore our quantum compilation techniques, which identify key reliability issues and propose solutions to improve both reliability and performance efficiency.

Bio:

Fan Chen is an assistant professor in the department of Intelligent Systems Engineering at Indiana University Bloomington. Her research interests include Quantum Computing and domain-specific computing. Dr. Chen is a recipient of the 2022 NSF CAREER Award, the 2019 Cadence Women in Technology Scholarship. Her research has won the Best Paper Finalists at DAC 2024, the Best Paper Award at QCE 2023, the Best Paper Award and the Ph.D. forum Best Poster Award at ASP-DAC 2018. Her contributions to the research community have been acknowledged by the 2024 ACM SIGDA Meritorious Service Award, the 2022 IEEE Best Associate Editor of the Circuits and Systems Society, and the 2021 Service Recognition Award of GLSVLSI.

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