Other

## Toward End-to-End Quantum Applications

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**Abstract:**
This is an exciting time for quantum computing. With the availability of prototypes of quantum machines, especially the recent establishment of quantum supremacy, it becomes possible and also important to investigate real-world end-to-end quantum applications. In this talk, I will discuss my efforts toward this goal, especially in the domain of optimization and machine learning, which are likely to be the foundation for many other quantum applications. Specifically, I will talk about provable quantum speedups in optimization and machine learning on fully-fledged quantum machines as well as proposals of quantum applications on near-term noisy-intermediate-size-quantum (NISQ) machines. Moreover, I will briefly talk about challenges in the actual implementation of these quantum applications from the perspective of software engineering, and outline our solutions with the help of techniques from the study of formal methods and programming languages.

**Speaker's Bio:**

Dr. Xiaodi Wu is an assistant professor in computer science at the University of Maryland, College Park and also a Fellow at the Joint Center for Quantum Information and Computer Science (QuICS). He obtained his Ph.D. from the University of Michigan, Ann Arbor and has worked at MIT, UC Berkeley, and U Oregon before joining Maryland. His research aims to achieve end-to-end quantum applications by investigating both the theory side and the software system side, which has received supports from NSF, DOE, ARO, and AFOSR.



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