

Data Management in the Noisy Intermediate-Scale Quantum (NISQ) Era

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Quantum computing has emerged as a promising tool for transforming the landscape of computing technology. Recent efforts have applied quantum techniques to classical database challenges, such as query optimization, data integration, index selection, and transaction management [2]. In this talk, I will shift focus to a critical yet underexplored area: data management *for* quantum computing. We are currently in the Noisy Intermediate-Scale Quantum (NISQ) era, where qubits, while promising, are fragile and still limited in scale. After differentiating quantum data from classical data, I will outline current and future data management paradigms in the NISQ era and beyond. During the talk, I will address the data management challenges arising from the emerging demands of near-term quantum computing [1]. The goal is to chart a clear course for future quantum-oriented data management research, establishing it as a cornerstone for the advancement of quantum computing in the NISQ era.

References

- [1] Rihan Hai, Shih-Han Hung, Tim Coopmans, and Floris Geerts. Data management in the noisy intermediate-scale quantum era. <https://arxiv.org/abs/2409.14111>, 2024.
- [2] Rihan Hai, Shih-Han Hung, and Sebastian Feld. Quantum data management: From theory to opportunities. In *2024 IEEE 40th International Conference on Data Engineering (ICDE)*, pages 5376–5381, 2024.