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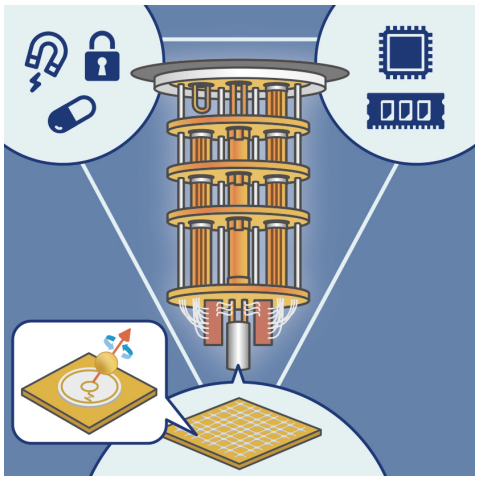
We build superior designs with understanding of how hardware and software work together

"Co-creative multi-layer design" for large-scale quantum computing

IOWN Future

Information-Processing Technology to Enrich Society

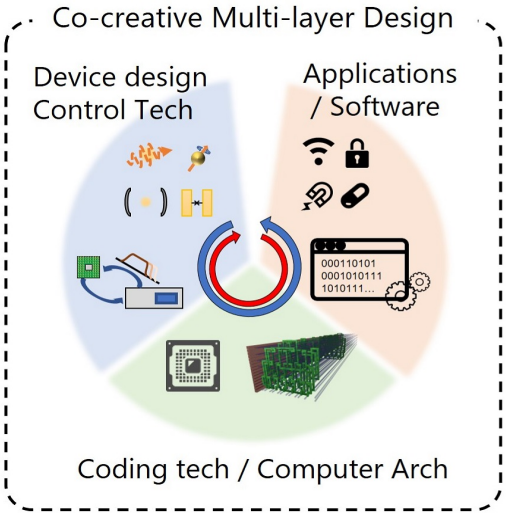


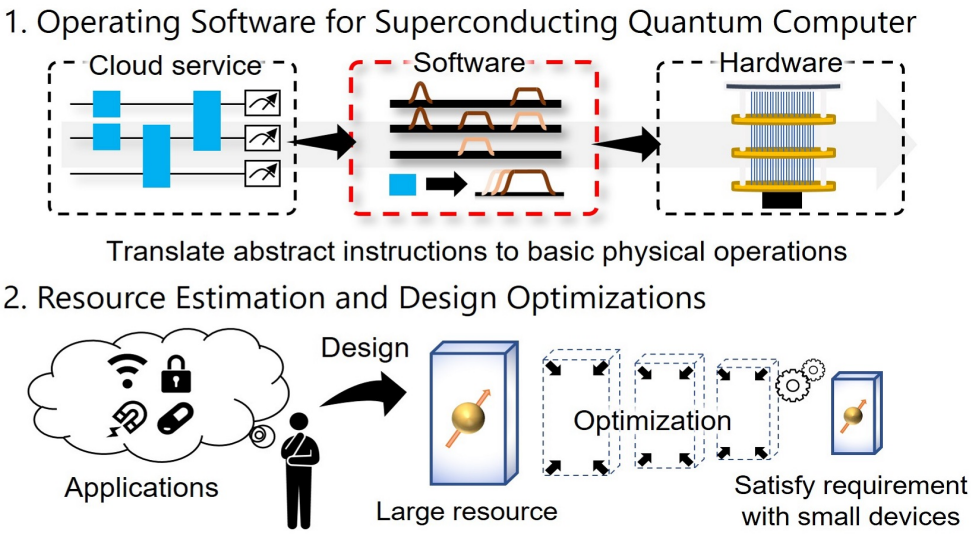
Background

Expectations are growing for quantum computers as next-generation high-speed computers. However, there are still many challenges to be overcome to realize a large-scale quantum computer that can perform highly accurate and efficient processing for practical problems.

Summary

We will introduce high-precision control software for running superconducting quantum computers and efficient hybrid quantum error reduction methods that accelerate the realization of large-scale quantum computation, obtained through our unique "co-creative multi-layer design".





Features

- "Co-creative multi-layer design" to improve efficiency and precision of quantum computers based on mutual understanding of hardware and software mechanisms
- Developed control software for high-precision control of qubits, contributing to the first domestically produced quantum computer cloud service
- A hybrid error reduction method as an Early-FTQC technique that connects noisy intermediate-scale quantum computers with large-scale fault-tolerant quantum computer (FTQC)

Future_benefits

We provide guidelines for the optimal design of quantum computers and enables early realization of large-scale quantum computing that can solve practical problems.

Collaboration partners

RIKEN, The University of Tokyo, Osaka University, Kyushu University, Fujitsu Limited, The National Institute of Advanced Industrial Science and Technology

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