2nd International Conference on

Quantum Physics and Quantum Technology

September 25-26, 2017   Berlin, Germany

Development of Quantum Computing Platform to Design, Analyze, and Run a Practical Quantum Computer

Byung-Soo Choi
ETRI, South Korea

Statement of the Problem: Quantum computer is believed to show the different level of computing power than the conventional supercomputer. By using the quantum superposition, entanglement, and interference, it is possible to do quantum-level parallel computation. However, it is very hard to make a practical quantum computer under the real situation. For wider user, the quantum computer should be scalable, reliable, and general. At the same time, the computing power should be higher than any supercomputer. Unfortunately, if we build up a practical quantum computer under the current technology and methodologies, the quantum computing power is not so much high. To overcome this problem, we should analyze what is the real problems of low performance quantum computing.

Methodology & Theoretical Orientation: To resolve this problem, we have developed a quantum computing platform, which can support the user level programming, automatic mapping to the quantum computing architecture, automatic building a necessary reliable components, and finally making a report of the quantum computing performance with the resource requirement. By using this platform, we can design and optimize the practical quantum computer and improve its computing power by reducing resource overhead.

Conclusion & Significance: In this talk, therefore, we explain the details of the quantum computing platform. First we show the platform structure and its local interfaces. Second, we mention how the user quantum computer program can control the quantum devices. Third, we demonstrate how this platform can be used for evaluating the target quantum computing performance under the given practical inputs such as quantum algorithms, quantum error-correction codes, and quantum devices. We conclude this talk with some on-going issues and future works.

bschoi3@etri.re.kr

J Laser Opt Photonics, an open access journal
ISSN: 2469-410X

Quantum Physics 2017
September 25-26, 2017

Volume 4, Issue 3(Suppl)

Page 59