Domain-oriented services and resources of Polish Infrastructure for Supporting Computational Science in the European Research Space – PLGrid Plus

A Novel Environment for Simulation of Quantum Computing

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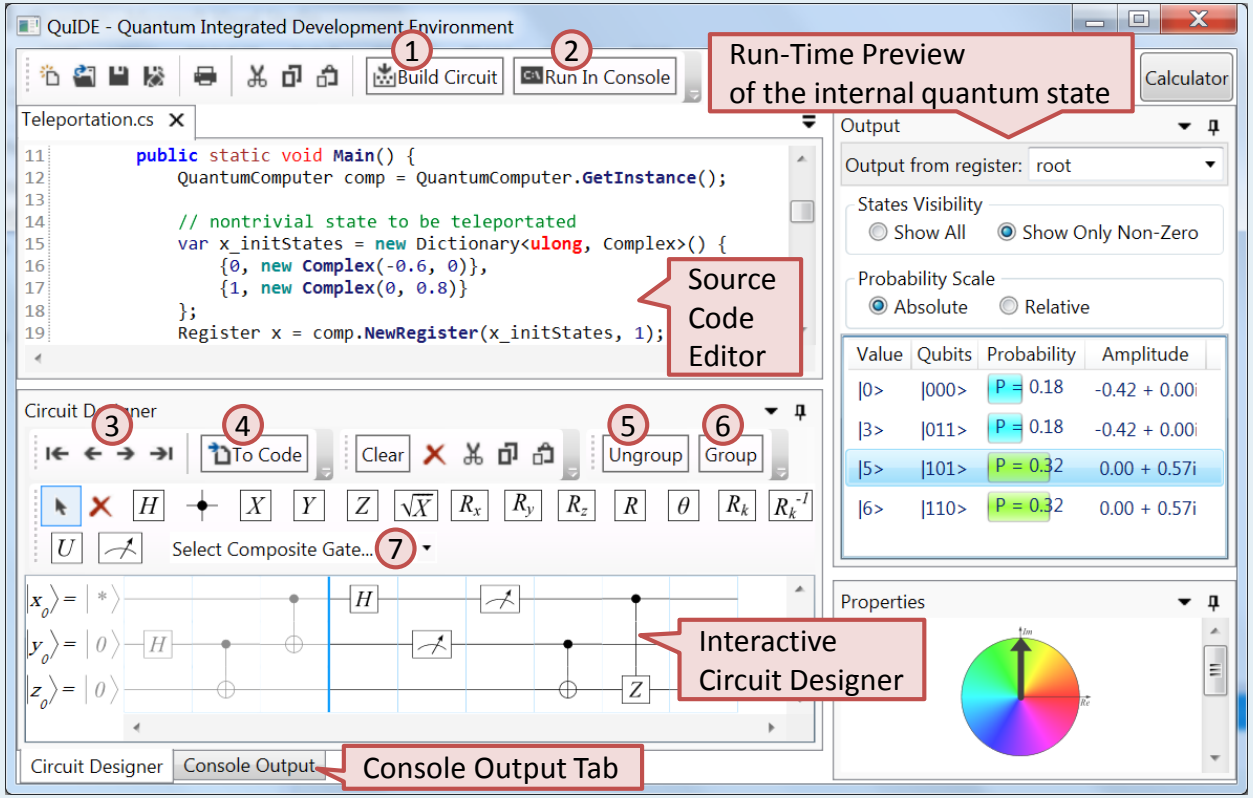
QuIDE – Quantum IDE

Objective: Design a simulator which will help to understand and learn quantum computing in an efficient way



- generate the quantum circuit from the source code (1)
- generate the source code from the circuit (4)
- execute the quantum circuit in the console (2)
- evaluate the circuit step-by-step in the Run-Time Preview (3)
- group the quantum gates into composite gates (6),
- ungroup composite gate (5)
- a large set of predefined composite gates (7)

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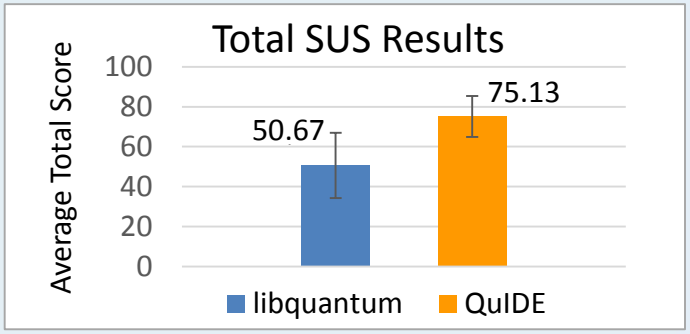
Results

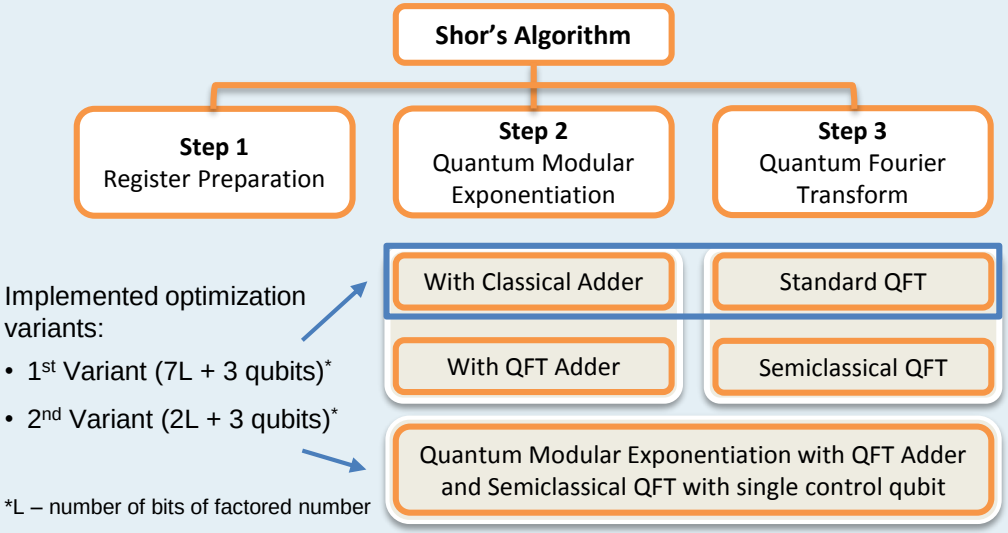
Usability Evaluation:

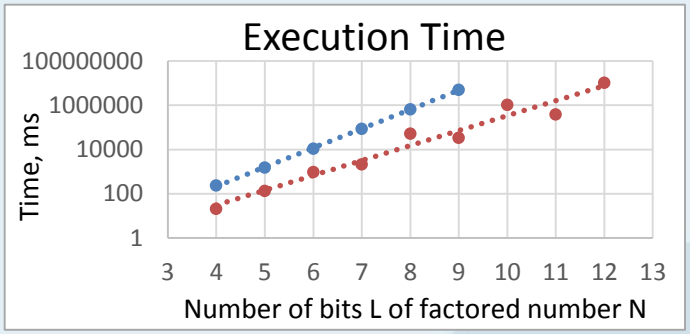
- QuIDE was used at the Quantum Computation classes at DCS AGH
- Usability measured by System Usability Scale surveys

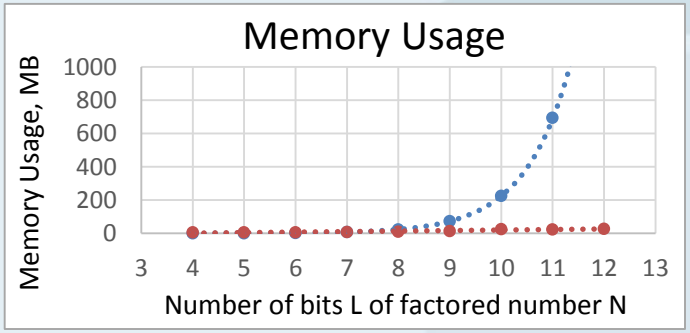


Shor's Algorithm Simulation:

- Two implementation variants simulated and compared







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More

- *Review, analysis and simulation of quantum algorithms in cryptography*, Bartłomiej Patrzyk; **Master of Science Thesis** supervised by Katarzyna Rycerz; AGH University of Science and Technology, Kraków, Poland (September 2014)

- *Graphical and programming support for simulations of quantum computations*, Joanna Patrzyk; **Master of Science Thesis** supervised by Katarzyna Rycerz; AGH University of Science and Technology, Kraków, Poland (September 2014)

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