



Quantum Machine Intelligence

Editor-in-Chief: Giovanni Acampora

Topical Collection

Quantum Software: Theory and Practice

Guest Editors:

Alessandra Di Pierro (University of Verona, Italy)
Alejandro Perdomo-Ortiz (Zapata Computing, USA)
Margherita Zorzi (University of Verona, Italy)

Topical Collection Description:

Thanks to the progress in experimental quantum computing, devices that scale up to 50-100 qubits will be available in the near future, which might be able to perform tasks beyond the capabilities of today's classical computers. Such devices already allow us to execute quantum algorithms on quite significant inputs. To help the implementation task, much effort has been recently devoted to the design of quantum programming languages offering higher level functionalities than just a quantum analogue of assembly languages. The development of quantum software is therefore becoming a first-class scientific challenge that involves all stages of the quantum toolchain from quantum hardware interfaces quantum compilers to the implementations of quantum algorithms by means of various quantum computing paradigms such as the QRAM-based model, hybrid quantum-classical variational approaches, parametrized quantum circuit models, quantum annealing, and the discrete and continuous-variable gate-model.

This special issue will collect original results on recent advances in the development of Quantum Software.

Topics covered are:

- Quantum Languages Design and Implementation
- Quantum Software Verification
- Quantum Computing Platforms
- Quantum Programming for Machine Learning
- Quantum Simulators
- Higher-Order Quantum Programming
- Continuous-variables Quantum Computation
- Quantum Annealing
- Hybrid Quantum-Classical Variational
- Parametrised Quantum Circuit Models
- Quantum Circuits Compilers

Submission Information:

Articles must be submitted through the QUMI Editorial System using the link: <https://www.editorialmanager.com/qumi/default.aspx>

When submitting your paper, please select

“SI: Quantum Software: Theory and Practice” as Article Type,

so as to make sure that your paper is assigned to the special issue guest editors.

Please see the Instructions for Authors on the journal site (link.springer.com) if you have not yet submitted a paper through this web-based system.

Further Information: alessandra.dipierro@univr.it

Important dates:

- **Submission**
September 15, 2019

