

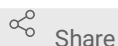


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Efficient realization of quantum primitives for Shor's algorithm using PennyLane library

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1 Works for me



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ABSTRACT

The following protocol describes how to use a software package containing implementations of various quantum gates and well-known quantum algorithms using PennyLane library. Templates within the package include all required elements from the quantum part of Shor's algorithm, specifically, efficient modular exponentiation and quantum Fourier transform that can be realized for an arbitrary number of qubits specified by a user.

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KEYWORDS

Quantum computing, Shor's algorithm, modular exponentiation, quantum Fourier transform, quantum arithmetics

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- 1 First of all, you should install the PennyLane library using the regular python environment and set up the Jupyter Notebook's environment

- 2 Content of the Github repository should be uploaded on your PC via the following link:

<https://github.com/Anatoly-Antipov/QuantumOperations>

Files with the extension ".py" represent original python code that realizes the software package with new useful functions built upon the PennyLane library. Functions from this software package are ready-to-use commands similar to PennyLane's functions and commands.

Files with the extension ".ipynb" are Jupyter Notebooks that contain examples of the use of commands from the software package.

See the README.md file in the repository to view an up-to-date description of included files

- 3 Use the file "Example.ipynb" or the file "ExampleOrderFinding.ipynb" to get the simplest example of the use of a new function. The file "Test.ipynb" contains the full list of newly introduced functions alongside the demonstration of its use in a Jupyter Notebook's environment.