**Abstract**

We provide a series of quantum algorithms from the less elaborate to the most complex one, of which the last one incorporates Θ(*logN*) simultaneous quantum states and Θ(*loglogN*)number of qubits. All of them have quantum exponential time in the worst case. However, the last and more elaborate of these quantum algorithms, can have the most probabilistic running time polynomial, or even polylogarithmic with respect to the distribution of the isomorphic sub-graphs in the graph. Therefore, the Sub-Graph Isomorphism problem, which is **NP**-complete over the classical computing model, belongs most probably to the **BQP** quantum complexity class. All of these algorithms are based on a new universal quantum computational machine model, which does not rely either on circuitry or on Ansatz heuristics. This machine model allows us to quantify quantum algorithms with a reduced each time number of qubits and running time.