

ABSTRACT

Quantum mechanic theory has able to be applied on information world and created a quantum information theory where bits are replaced by qubits. This qubits has some counterintuitive characteristic which can provide a more complex and more sensitive new information processing method but very useful for data efficiency and security.

In this Final Project one of quantum system advantages is provided, it is on the data storage efficiency case using Schumacher method which will be compared to classical systems Rice coding. One of superiority in quantum computation is the ability of a quantum state to be on it superposition condition, so it could deliver extra more states for an equal qubit number to the classic bits.

Comparison that had been done is between quantum compression decompression result with the classical compression decompression method, but each of the systems output data will be analyzed first. In classical compression, Rice coding method is selected while for the quantum compression, Schumacher method is selected, both are lossless compression method and for it source messages, files with “.txt” extention are selected which obligate a lossless compression either. Parameters that will be analyzed dan compared on sender side is the compression rate and time while decompresson accuration and time is for the receiver side.

From this Final Project simulation and analysis, the acquired data shows that quantum system superiority on computation speed, regarding quantum parallelism characteristic, can not always be a guarantee for a better result on compression rate than classical computation.

Keywords : Compression, Lossless, Schumacher Quantum Data Compression, Rice Coding.