

## **TITLE:**

# **Design of Nano Communication Architecture with Reversible Logic Based on Quantum-Dot Cellular Automata**

## **Abstract**

Recent trends in nanotechnological field are the exploitation of quantum dot-cellular automata (QCA) as a substitute in advance to existing transistor based complementary metal oxide semiconductor (CMOS) technology to fabricate nano-circuit. Ultra low heat dissipation, faster clocking and high device density make the QCA as a raising research area in nanotechnological field to suppress the field effect transistor (FET) based circuit. QCA logic gates are the key factor to achieve nano-scale digital logic circuits. Besides, reversible logic has widespread applications in QCA. The low power dissipation and high circuit density of QCA pledge the energy-efficient design of logic circuit at a nano-scale level. However, the necessity of too many logic gates and detrimental garbage outputs may limit the functionality of a QCA-based logic circuit. Here, it has been shown how the reversible logic can be embedded within QCA logic devices, so that low power nanocommunication architectures can be achieved. The working principle of QCA circuit simulator QCADesigner tool has been utilized to check the design accuracy.

## **Keywords**

QCA; Majority gate; Cross-over; Clocking; QCADesigner; Reversible logic, nanocommunication.