

## **Nano-Electronic Integrated Circuits**

Since silicon CMOS device technology has been highly established and developed by today's semiconductor industries, it will be difficult to replace conventional MOS by some novel device. However, new functional elements will be essential to enhance a system on a chip performance, since CMOS performance is limited. This research explores using a simulation study the option of integrating single-electron tunneling devices with CMOS components in hybrid architectures for use in future nano-electronic integrated circuits.

## **Single-Electron Tunneling Transistors**

Single-electron tunneling transistors have attractive properties among which small size, very low power dissipation and potentially high speed, which make them attractive for use in local connectivity architectures such as neural networks. This project, using modeling and simulation, investigates a new neural network hardware concept based on single-electron tunneling technology.

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