



FIRST INTERNATIONAL NANOTECHNOLOGY CONFERENCE ON COMMUNICATION AND COOPERATION

Abstract

A Right-Brain-Computing System on Silicon Based on Nano Electron Devices

What are we expecting from the integration of nano electron devices? Surely the Moore's law would survive beyond the limit of conventional scaling. But, what systems are we going to build using the exotic current-voltage characteristics of nano devices with their seemingly less reliable and less powerful operations? Development of ultrahigh performance digital processors would not be a solution.

What I am presenting in this paper is a right-brain-like computing system that solves problems not by solving mathematical equations but by recalling and retrieving the most relevant event in our past experience. We propose to utilize the quantum resonance effect in nano-scale devices to represent a fragmental knowledge of humans and to build right-brain-like associative processor systems based on the vast scale integration of such resonance devices. Analog VLSI systems have been developed using simple CMOS circuits mimicking the quantum resonance characteristics. Applications to image recognition and medical radiograph analysis will be presented as demonstrative examples.