HOW TO MAKE NANOSPACE COMPUTER: LOGIC AND COMPUTER DESIGN USING HYPERCUBE

Nitin Jain  
Lect. IS Dept  
Bahubali College of Engineering  
Shravanabelagola, Karnataka India

Neha Jain  
Lect. BSAE Dept  
Bahubali College of Engineering  
Shravanabelagola, Karnataka

Abhijit Kangale  
lect. CS & Engg  
Bahubali College of Engineering  
Shravanabelagola

Srimatha  
Airtel Bangalore

ABSTRACT

Techniques for the advanced logic design of nanodevices and nanolCs in spatial dimensions are being formulated to incorporate specific topologies that satisfy certain requirements of nanotechnology. One of these topologies, the hypercube, is currently being considered for the design of a network-based combinational logic implementation in the form of a hypercube extension called the N-hypercube. We propose the M-hypercube, using a similar topology to design any sequential logic in spatial dimensions. To reduce the complexity of the hypercube design, two methods, a top-down and a bottom-up, are presented. The former uses sequential machine decomposition methods and the latter uses a new hypercube topology, called the MN-cell. The MN-cell, consisting of two closely coupled 2D hypercubes, an M-hypercube and an N-hypercube, is a 3D hypercube. It is shown that MN-cells can implement flip-flops and thus can be used as building blocks for sequential logic design in nanodimensions. The logic design of a basic computer in nanospace using MN-cells and N-hypercubes is also presented using several examples.