Abstract

In this paper we propose a method for synthesis of combinational networks using non
cventional logic gates. The logic components considered are Stochastic Logic Gates (SLGs)
able to change their logic functionality by means of a single control parameter and the
environmental level of noise. SLGs are able to adapt their computed logic function depending
on the environmental conditions. Circuits composed of SLGs are thus sensitive to changes in
the environment which alter the computed logic function. We propose a solution for the
synthesis of SLGs combinational networks able to produce a network operating fault tolerant in
different environmental conditions, i.e. different levels of noise. Given a description of the
problem, in form of a truth table, the synthesis of the network is performed by means of genetic
algorithms. The proposed solution is tested with a half-adder and compared to the optimal
solution found with an exhaustive search.

Index Terms

Computer Science

Algorithms

Keywords

Stochastic Logic Gate, Fault Tolerant, Genetic Algorithm, Non Conventional Computing