International J. of Engg. Research & Indu. Appls. (IJERIA).
ISSN 0974-1518, Vol.4, No. I (February 2011), pp 277-292

INFLUENCE OF PARALLELISM ON COMPUTATIONAL SPEED AND ERROR PREDICTION FOR ARTIFICIAL NEURAL NETWORK BASED PARAMETER OPTIMIZATION IN NANODEVICES

DAYANANDA NAYAK, HAMSAVENI N, PUTTAMADAPPA C AND SUBIR KUMAR SARKAR

Abstract

A soft computing tool, Artificial Neural Network (ANN), is used in the present work to get optimized system parameters of GaAs and (In, Ga)As quantum wells for desired device characteristics. A combination of device scaling with new device structure and/ or new material has stimulated active researches in the area of nanodevices. To extract the best performance from a device it is very essential to choose the parameters intelligently as the performance is controlled by them. Hence to predict the best parameters at a time it is better to think over some special computational methods. As an attempt towards such computing, adaptive intelligent controls by neural network are deployed here to predict the device parameters so as to get the best performance from the device. In the present work we have investigated in details the influence of parallelism on computational speed and error prediction for ANN based parameter optimization in nanodevices. Special attenuation is taken to investigate the effects parallelism on training time, rms errors for change in the number of data set and iteration numbers.

Keywords : Adaptive intelligent , parallelism, optimization, artificial neural network, soft computing tool