# Fast Neural Networks Training For Class Identification using Parallel Processing

Mehran Aminian
St. Mary's University
maminian@stmarytx.edu

Farzan Aminian
Trinity University
faminian@trinity.edu

Shohreh Omidi Varmazani
Trinity University
somidiva@trinity.edu

## Abstract

An efficient neural network architecture, very suitable for parallel processing of class identification, is presented. In this approach, different classes that need to be identified by the neural network are divided into several groups. At the first level, all the classess are placed in a few number of groups (usually two or three) called level one groups. Level two groups are formed by consecutively divideding each group in level one into smaller groups. This process continues until at the last level, each group contains two or at most three classess. The training process consists of a separate neural network module for each level which is trained to identify the groups to which the class belongs. This leaves every neural network module at different levels with a very easy task of isolating the group that contains the class of interest. It has been shown that this method to neural network trinaing performs much more accurately compared to conventional approach. Another important advantage of this technique is the drastic reduction in training time compared to the standard methods in nueral network training. This stems from the fact that all the neural network modules in this approach are completely independent of each other and can be trained simultaneously in a parallel processing environment.

## Biographies

MEHRAN AMINIAN received his M.S. and Ph.D. degrees in electrical engineering from the University of Oklahoma, Norman, in 1982 and 1989, respectively. Currently, he is a professor of electrical engineering at St. Mary's University in San Antonio, Texas. His research interests include neural networks and quantum collision theory. Dr. Aminian may be reached at maminian@stmarytx.edu.

FARZAN AMINIAN received his M.S. and Ph.D. degrees in electrical engineering from The Ohio State University, Columbus, in 1983 and 1989, respectively.
He joined the Engineering Science Department at Trinity University, San Antonio, in 1989, where he is currently a professor and chair. His areas of interest include application of Monte Carlo technique, solid state devices, and neural networks. Dr. Aminian served as the chairman of the Central Texas Section of IEEE. He may be reached at faminian@trinity.edu.

SHHREH OMIDI VARMAZANI received her M.S. degree in engineering system management from St. Mary's University in San Antonio, Texas. She is currently with the Engineering Science Department at Trinity University serving as the engineering senior design coordinator.