01 Jan 1989

Possible Applications of Neural Networks in Manufacturing

S. Lammers

Cihan H. Dagli

Missouri University of Science and Technology, dagli@mst.edu

Radar Target Identification using the Learning Vector Quantization Neural Network

Stanley C. Ahalt Tzyy-ping Jung Ashok K. Krishnamurthy
Department of Electrical Engineering
The Ohio State University

ABSTRACT

We study the application of neural network classifiers for identifying aircraft from coherent and noncoherent radar backscatter measurements. The neural network classifier studied is the FSCL-LVQ, a variation on Kohonen's LVQ classifier. This classifier learns in two phases: an unsupervised first phase and a supervised second phase of training. We show that the performance of the neural classifier is close to that of the maximum-likelihood and the nearest-neighbor classifiers. Our results also indicate that the neural classifier are relatively insensitive to the noise level of the training data and the network architecture.

POSSIBLE APPLICATIONS OF NEURAL NETWORKS IN MANUFACTURING

Cihan H. Dagli and Scott Lammers

Department of Engineering Management
University of Missouri-Rolla
Rolla, Missouri 65401

ABSTRACT

Neural networks, also known as parallel distributed processing is considered a revolutionary new approach for solving certain types of problems that have posed difficulty to engineers and operations research practitioners in the past. This paper examines the potential of neural networks and assess the impact of parallel processing in the design and operations of manufacturing systems. After an initial discussion on possible areas of application, and approach that integrates artificial intelligence, operations research and neural networks for the solution of a scheduling problem is examined.

A BACK-PROPOGATION NETWORK FOR CLASSIFYING AUDITORY BRAINSTEM EVOKED POTENTIALS: INPUT LEVEL BIASING, TEMPORAL AND SPECTRAL INPUTS AND LEARNING PATTERNS

Doğan Alpsan* and Özcan Özdamar

University of Miami
Department of Biomedical Engineering
PO Box 248294
Coral Gables, FL 33124 USA

ABSTRACT

This study reports the results of an investigation conducted to examine the effects of various input data forms on learning of a neural network for classifing auditory evoked potentials. The long-term objective is to use the classification in an automated device for hearing threshold testing. Feedforward multi-layered neural networks trained with the back-propogation method are used. The effects of presenting the data to the neural network in various temporal and spectral modes are explored. Results indicate that temporal and spectral information complement each other and increase performance when used together. Learning curves and dot graphs as they are used in this study may reveal network learning strategies. The nature of such learning patterns found in this study are discussed.

HIGH ENERGY PHYSICS APPLICATIONS OF NEURAL NETWORKS

Bruce Denby
Fermi National Accelerator Laboratory
M.S. 234
Batavia, IL 60510

ABSTRACT

Neural networks implemented in silicon have been shown to solve certain pattern recognition problems on a time scale of hundreds of nanoseconds [1]. Fast pattern recognition is at a premium in High Energy Physics research at particle accelerators because a) the ability to recognize interesting events in a high rate background requires fast recognition of characteristic patterns, and b) the detailed off-line pattern recognition of millions of events requires exorbitant amounts of CPU time on conventional computers. Neural networks may thus be an ideal technology for application to High Energy Physics data analysis.