

**PACKAGE ID** - 001073MLTPL00 GENETICNEURONS

**KWIC TITLE** - Genetic Algorithm Based Neural Networks for  
Nonlinear Optimization

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**LIMITATION CODE** -COPY                   **AUDIENCE CODE** - UNL

**COMPLETION DATE** - 09/01/1994   **PUBLICATION DATE** - 09/01/1994

**DESCRIPTION** - This software develops a novel approach to nonlinear optimization using genetic algorithm based neural networks. To our best knowledge, this approach represents the first attempt at applying both neural network and genetic algorithm techniques to solve a nonlinear optimization problem. The approach constructs a neural network structure and an appropriately shaped energy surface whose minima correspond to optimal solutions of the problem. A genetic algorithm is employed to perform a parallel and powerful search of the energy surface.

**PACKAGE CONTENTS** - Media Directory; Software Abstract; Media Includes Source Code;

**SOURCE CODE INCLUDED?** - Yes

**MEDIA QUANTITY** - 1 3.5 Diskette

**METHOD OF SOLUTION** - The problems of optimization, especially nonlinear and constrained optimization, are common in many areas of science and technology. Finding closed-form solutions to these problems is difficult because of the complexity of multi-dimensional spaces in which these problems are defined. The approach embodied to tackle nonlinear constrained optimization problems is a novel symbiotic synthesis of two advanced areas of artificial intelligence: artificial neural networks and genetic algorithms. The embodiment is a system for designing optimal distribution of points on the surfaces of hyper-spheres in multi-dimensional space. The objective is to provide closed-form solutions to various constrained nonlinear optimization problems.

**COMPUTER** - MLT-PLTFM

**OPERATING SYSTEMS** - Unix

**PROGRAMMING LANGUAGES** - C

**SOFTWARE LIMITATIONS** - The maximum number of points allowed is defined as 3000.

**SOURCE CODE AVAILABLE (Y/N)** - Y

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**UNIQUE FEATURES** - Compact size and user friendly interface.

**RELATED SOFTWARE** - None

**TIME REQUIREMENTS** - The time required is dependent on the platform used.

**ABSTRACT STATUS** - Submitted 12/28/95. Retaseed screened 4/22/96.

**SUBJECT CLASS CODE** - P

**KEYWORDS** -

COMPUTER PROGRAM DOCUMENTATION  
G CODES  
NEURAL NETWORKS  
ALGORITHMS  
NONLINEAR PROBLEMS  
PARALLEL PROCESSING  
COMPUTER CALCULATIONS

**EDB SUBJECT CATEGORIES** -  
990200 220100

**SPONSOR** - DOE/ER

**PACKAGE TYPE** - SCREENED