

# VisSim/Neural-Net™

Nonlinear Pattern Matching and System Identification Software

# v8.0

Modeling The Future

VisSim/Neural-Net excels at nonlinear system identification, problem diagnosis, decision making, prediction, and other problems where pattern recognition is important and precise computational answers are not readily available.

VisSim/Neural-Net is based on NeuroWindows® developed by the Ward Systems Group.

## HIGHLIGHTS

- Back Propagation, Back Propagation with Momentum, General Regression, Probabilistic, and Kohonen/LVQ learning
- Continuous and discrete outputs
- Interactive modification of training characteristics and learning rates
- Interactive monitoring of error rate
- Save and restore learned weights
- VisSim blocks for building and evaluating neural networks
- Accommodate sophisticated networks of multiple neuralNet blocks (up to 32 layers per network; 32K neurons per layer; 128 networks per diagram)

The screenshot displays the VisSim interface for a cart-pole control system. The main workspace shows a neural network diagram with 4 input nodes, 2 hidden layers of 8 neurons each, and 1 output node. The network is connected to a cart-pole system. Two graphs are visible: 'Neural Net Error in Learning Mode' showing error on a logarithmic scale from 10<sup>-7</sup> to 10<sup>-1</sup> over 5 seconds, and 'Theta & Theta Dot' showing the angle and its derivative over time. The 'Neural Net Setup' dialog box is open, showing the following settings:

- Weight File Commands: Weight File: cp.net, Save Weights at Sim End (checked), Read Weights at Sim Start (unchecked).
- Characteristics: Inputs: 4, Outputs: 1, Categories: 0, Hidden Layers: 2, Neurons/Layer: 8, Learn Rate: 0.5, Momentum: 0.7, Weight Range: 0.9, Max Epochs: 0.
- Learning Methods: Back Propagation (selected), BP/Momentum, Kohonen/LVQ, Probabilistic, General Regression.

Training a neural network to control a cart-pole dynamic system (above). The Neural Network dialog box provides a simple mechanism to enter network characteristics and learning method (left).

## System Requirements

- Professional VisSim 8.0
- Windows XP, Vista, or 7
- 128 MB RAM
- 125 MB hard disk space

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## About Visual Solutions

Visual Solutions is a pioneer in the development of world-class software for modeling and simulating complex dynamic systems and for Model-Based Design of embedded systems.

VisSim is a visual environment for developing system models and performing dynamic simulations. Its unparalleled power, ease of use, and reliability has made it an essential tool on thousands of engineering projects spanning a diverse range of industries and disciplines, including motion control, closed-loop control, automotive, HVAC, aerospace, medical devices, and embedded controls development.

Since its founding in 1989, Visual Solutions has maintained a strong connection with the academic community. Visual Solutions software products have been incorporated into the curricula and research laboratories at thousands of universities and colleges. It has enhanced and improved teaching methods, learning skills, and research strategies.



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