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# Software review: BrainMaker v2.3

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**BRAINMAKER v2.3**  
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Artificial intelligence has been the subject of thousands of research efforts over the last 30 years. An aspect of artificial intelligence, neural networks have recently received a great deal of attention, both by researchers and practitioners in government and business. In fact, 80 percent of the Fortune 500 companies have a current investment in neural networks.

A neural network is a highly interconnected group of neurons that process information in parallel. An artificial neural network is a model that stimulates a biological neural network. Unlike expert systems, which require a set of rules to deduce a conclusion, neural networks use "fact sets" (which include facts and results) to induce results. The neural network is then "trained" to discern patterns in the facts which will consistently lead to the known results. Once the network is trained, new facts can be presented to the model and the result, or prediction, is then generated by the trained network.

Neural networks have been employed successfully in a variety of settings, including banking, manufacturing processes, insurance, defense, security, agriculture, character recognition and medical technology.

An inexpensive way to experiment with neural networks on the PC is with BrainMaker by California Scientific Software. The program is bundled with NetMaker v2.3 which is used to prepare data for analysis in BrainMaker. With NetMaker, you enter data from ASCII, database, or spreadsheet files and label each variable in the data set. NetMaker then creates the definition, training, and testing files required to execute BrainMaker. BrainMaker then automatically "trains" the network until it can accurately predict the results defined in the data set. The "trained" network can then be tested with the test file created by NetMaker. BrainMaker also offers diagnostics which allow users to fine-tune their networks and improve their accuracy. Once satisfied with the results, raw data can be entered as a "run file" (a data file without the predicted results included). The "run file" can be created in a spreadsheet, editor, database and then formatted in NetMaker. The "run file" is processed by the trained network resulting in an output file containing the results from the neural network.

BrainMaker includes eight sample data sets so the user can immediately see the resulting neural network. The eight sample neural networks include an optical character recognition network, an exchange rate predictor, text to speech conversion, fruit from shape and color, an image categorizer/processor, tic-tac-toe, and a stock price predictor.

The program is easy to install and operate. After taking the tutorial and working with the eight sample data sets a user should easily be able to construct and run their own neural networks. An interface is included which allows BrainMaker results to be exported to graphics, database, and spreadsheet programs. Extensive use of pull-down menus assist in network development. However, the documentation is quite vague and confusing regarding the creation of "run files." The documentation for the screen editor (SEE) could be clarified. Once the files are created and formatted correctly, however, the program runs efficiently and smoothly.

### **Major Features**

- Handles up to 512 independent variables (number of columns)
- Spreadsheet-like data entry
- No programming required
- Tutorial and eight sample networks
- Pull-down menus
- SEE screen editor
- Imports from LOTUS 1-2-3, dBase, binary, ASCII
- 512 neurons per layer, 32,767 connections per layer, 8 layers, 5 types of neurons
- Print or edit the neuron connection matrices
- 200 page book on neural networks included
- Detailed User's Guide and Reference Manual

A professional version is available (BrainMaker Professional v2.0) for \$795. This version can create larger networks, has built-in graphics, a network optimizer, data verification, neuron sensitivity, fourier analysis capabilities, and a run time system and license. However, for the casual interested user or experimenter, BrainMaker v2.3, at \$195, is well worth the price. Order information can be obtained by calling California Scientific Software at (800) 284-8112.

System Requirements: IBM PC, XT, AT, PS/2 or compatible, 256k memory, two 5¼" 360k floppy drives or one 5¼" 1.2MB or 3.5" 720k drive, any display adaptor, and PC or MS/DOS 3.0 or higher. Optional and highly recommended: math co-processor, color monitor, mouse, and a hard disk.