Neural Network Predicts Movie Success

Consider the neural network developed by Ramesh Sharda and Dursun Delen to determine whether a new movie will be successful or not. The network accepts seven values as input, including the film's category (comedy, science fiction), whether the film is a sequel, the level of special effects in the film and how big a star the main actor is. The output is an estimate of the box-office gross revenues. Neural networks consist of a number of layers, each layer made up of a number of nodes (see figure below). Each node performs a mathematical calculation on whatever input is given to it, then passes the results to a node in the next layer. This continues until the output layer, which outputs the result, typically some sort of classification. In this case the output is one of seven classes from 'flop' to 'blockbuster'. But how does each node know what calculation to perform to arrive at the correct output? This is determined during a process known as training. To train the network, the computer scientists showed it data about over 800 films for which the gross revenue was known. The network then adjusted the calculations performed by each node so that the output for each film in the training set was as close as possible to the film's known class.



So with a film that was known to be a flop, the nodes were adjusted so that the output was 'flop'. This was repeated with all the films. Then the entire process was repeated again and again, constantly refining the values at each node, until a relatively stable network structure emerged. To use the network, the user presents it with the seven input variables for a new movie (where the revenue is not known) and it makes its prediction. Sharda and Delen report that their output is accurate 37% of the time, and reasonably accurate 75% of the time.

Questions

- 1. Who might be interested in this neural network?
- 2. A neural network attempts to mimic human thought. Given the above description, do you think it does? Explain your answer.
- 3. Can you think of any decisions that you make that could benefit from a neural network?
- 4. Would you trust a neural network with your life? For instance, would you get in a plane about to be flown by a neural network? Do a web search and you will find this is not a theoretical possibility.

SOURCES: Sharda, R. and Delen, D., 'Predicting Box Office Success of Motion Pictures with Neural Networks', *Expert Systems with Applications*, Vol. 30, 2006, pp. 243–254.