

A Neural Network for Playing Dobo

DOBO - Dobo is a game in which you have an $N \times M$ sized board, with each partition of the board containing an object, normally a stone. The game is played turn by turn, with two players. A player can remove a horizontal or vertical line of stones, where a line of stones consists of one or more contiguous stones. The player that must remove the last stone loses.

The Neural Network - To learn how to play DOBO, a neural network will be made in which all of the states of the partitions of the board will be read into the input layer of the network, each node symbolizing a location on the board. Intermediary “hidden” layers will be used for developing strategy through analysis of training games, and the output layer, will represent the list of all possible moves. A “lookup table” will be used for training data and will be made by converging probabilities of winning from a certain state through evaluations of games in reverse once they have finished, updating probabilities of the states in the winning strategy closer to 1, and states in the losing strategy closer to 0. Once the training data is comprised, the network will be trained with a back propagation algorithm, being a proper technique for this problem because it is essentially a pattern classification problem of game states. A more interesting idea would be to have a network evaluate the probability of winning of a board state without a table, and before each move evaluate the possible states accessible from the current, however would require more research.

<https://users.auth.gr/kehagiat/Research/GameTheory/12CombBiblio/TicTacToe.pdf>