A review of Game Tree Searching by Min/Max Approximation :

A brief summary of the paper's goals or techniques introduced (if any).
The goal of this paper is to develop a technique to select which tip/leaf of a game tree should be expanded. The technique relies mainly on two ideas, an iterative penalty based approach to evaluate nodes and a method to approximate the min and max functions used in the node evaluation.

The penalty-based scheme presented assigns penalties to each branch in a game tree, where the value of the penalty is based on an evaluation function. At each step a leaf of the current tree is chosen, and the successors of that tip node are added to the tree. Then the values provided by the evaluation function at the new leaves are used to update the 'backed-up' values of the ancestors. In this paper the evaluation function uses an approximation to the min/max operators. The idea is then to expand the leaf which has the most influence on the value of the root, which would be the leaf with the lowest overall penalty.

The "min" and "max" operators can then be approximated using the generalized mean-value operators. The generalized mean is of interest here because it is a function with a continuous derivative, which means that the derivative can be used in the computation of the overall penalty. The tip with the largest derivative will therefore have the most influence on the backed-up value at the root. This tip is the next one to be expanded.

A brief summary of the paper's results (if any).
The authors tested the min/max approximation technique developed against an implementation of alpha-beta pruning using a game of connect four. The complete experiment consisted of 98 games, with alpha-beta going first in half of them. The experiment was then run with 5 different time limits, as well as with 5 different move limits, for a grand total of 980 games altogether. When the time was bound, alpha-beta pruning gave better results, however when the number of moves were limited, the min/max approximation technique gave better results. Alpha-beta pruning called the move operator roughly 3 times more than min/max approximation, which yields the result that min/max approximation would be the more adequate solution in a scenario where the move operation is expensive to implement.