

CPCS331 – Artificial Intelligence – Spring2020 -Project I

[ Using Alpha Beta, Minimax and MCTS algorithms]

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# Part 2

# 2. Monte Carlo Tree Search technique to solve “Dots and Boxes” puzzle

## 2.1 MCTS Algorithm explanation.

A tree structure is a hierarchy of linked nodes where each node represents a particular state. The structure has nodes, these nodes have none, one or more child nodes. There is a particular way for a solution, The exits path from the "root" node (initial state) to a "goal" node (desired state). Tree search algorithms attempt to find a solution by traversing the tree structure, it's starting at the root node and thoughtfully expanding the child nodes in a specific way.

Monte Carlo algorithm is a tree search algorithm that starts from any state and tries to improve it by producing its successors and choose the one that is more optimal than the current node and the other successors. It becomes useful as it continues to evaluate other alternatives periodically during the learning phase by executing them, instead of the current perceived optimal strategy. The process of Monte Carlo Tree Search can be broken down into four distinct steps, viz., selection, expansion, simulation, and backpropagation. Figure (1) shows each of these steps below:

A close up of a device

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