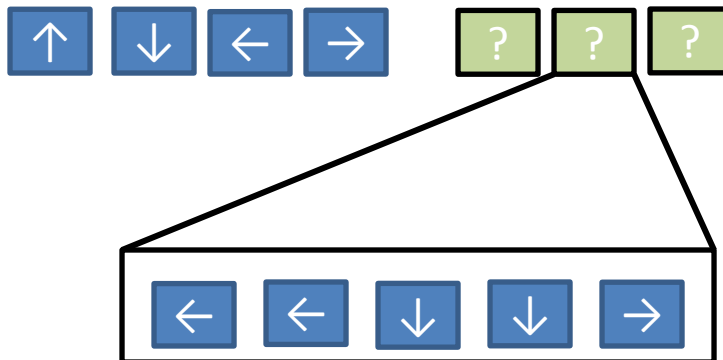
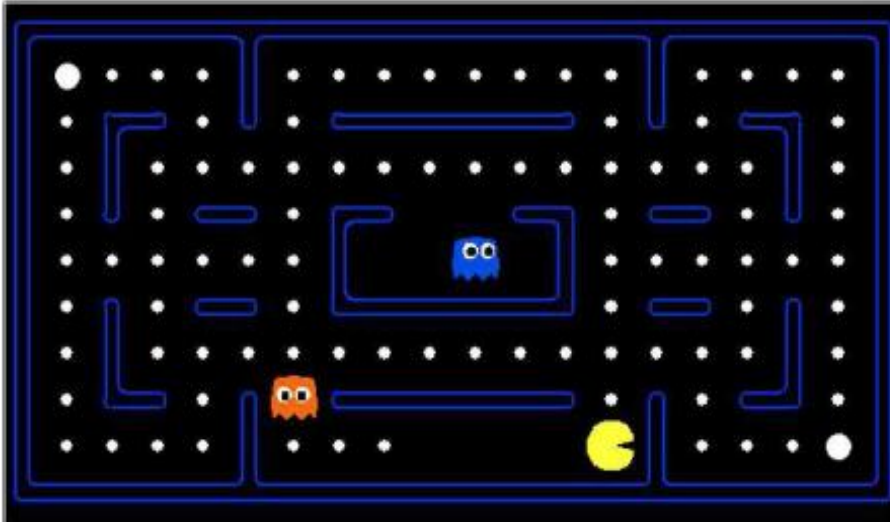


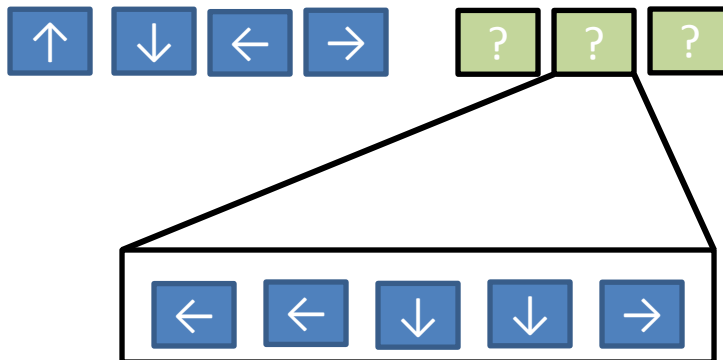
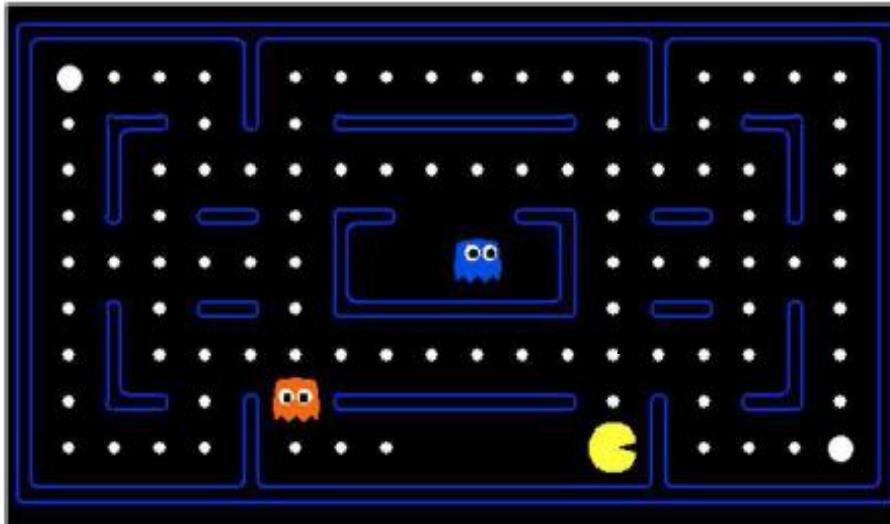
Making RL practical

Yay! for Kaushik Subramanian

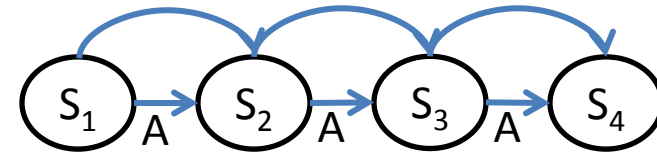
Pac-Man



Pac-Man



Extended Actions or
Options

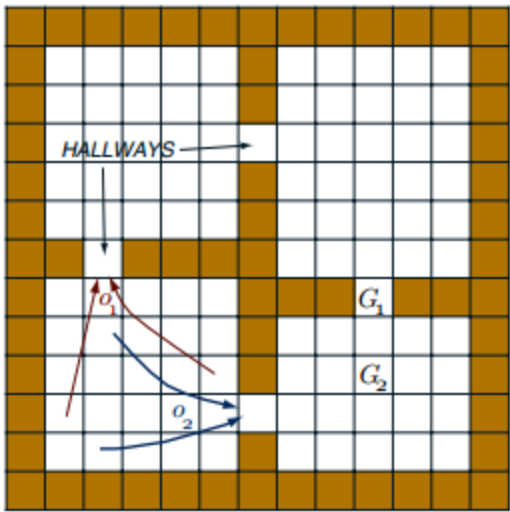


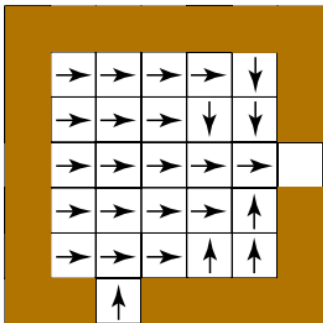
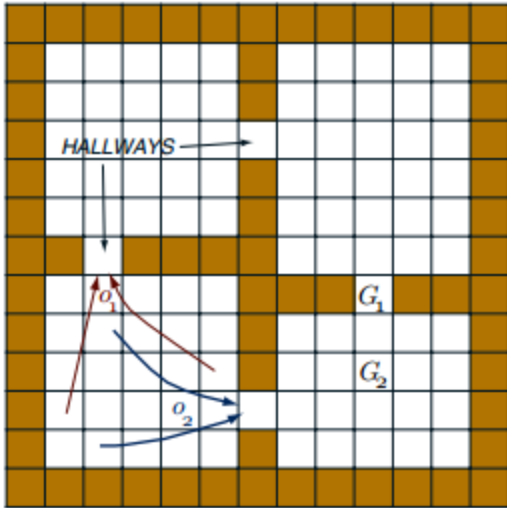
$\langle I, \pi, \beta \rangle$

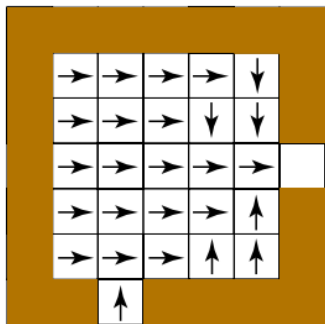
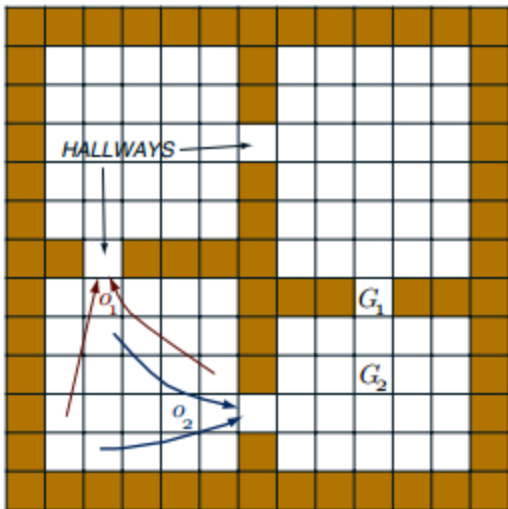
$I \in S$

$\pi: S \times A \rightarrow [0, 1]$

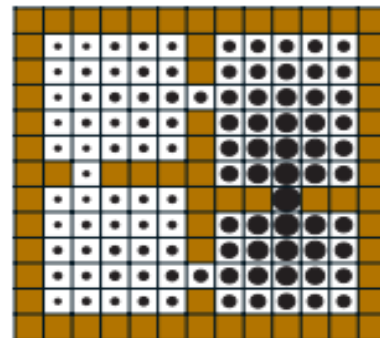
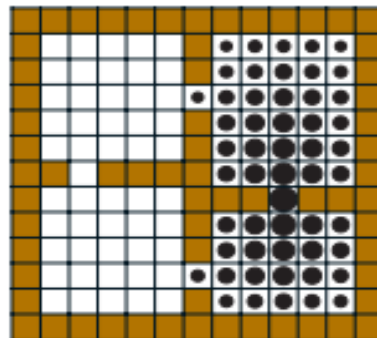
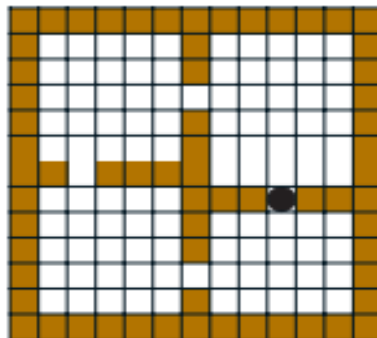
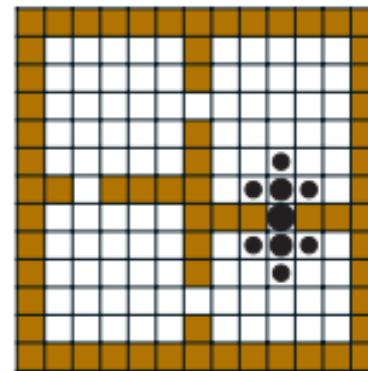
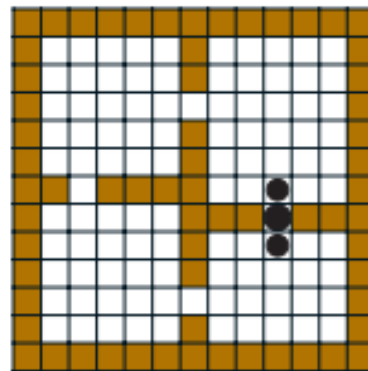
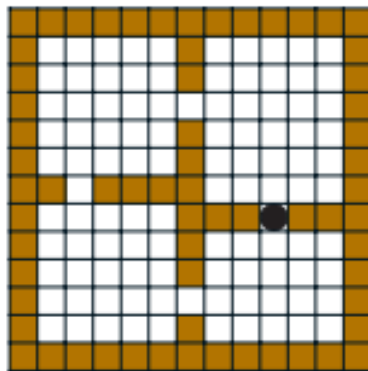
$\beta(s)$ is the termination set







Hallway
options
 $\mathcal{O}=\mathcal{H}$



Initial Values

Iteration #1

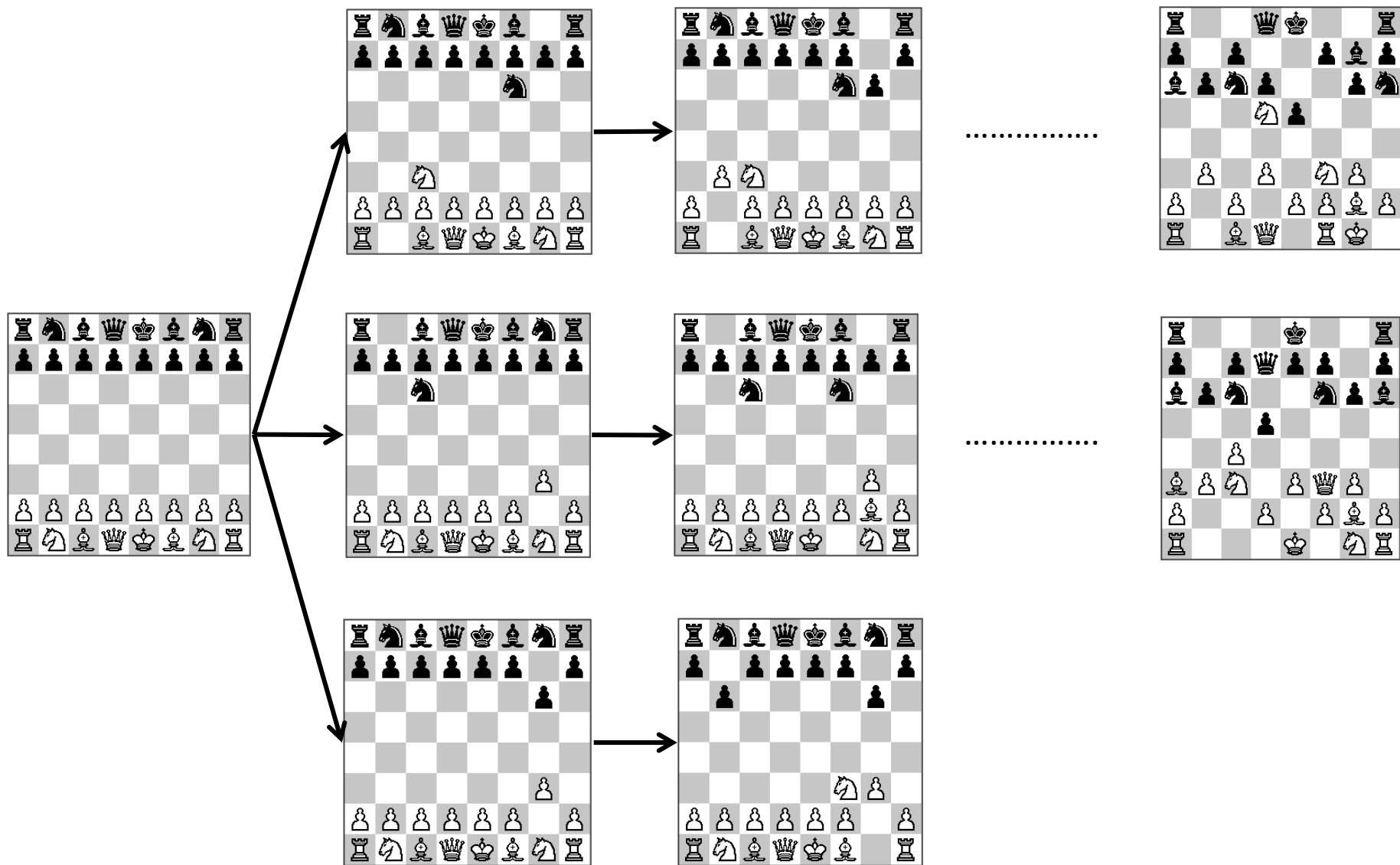
Iteration #2

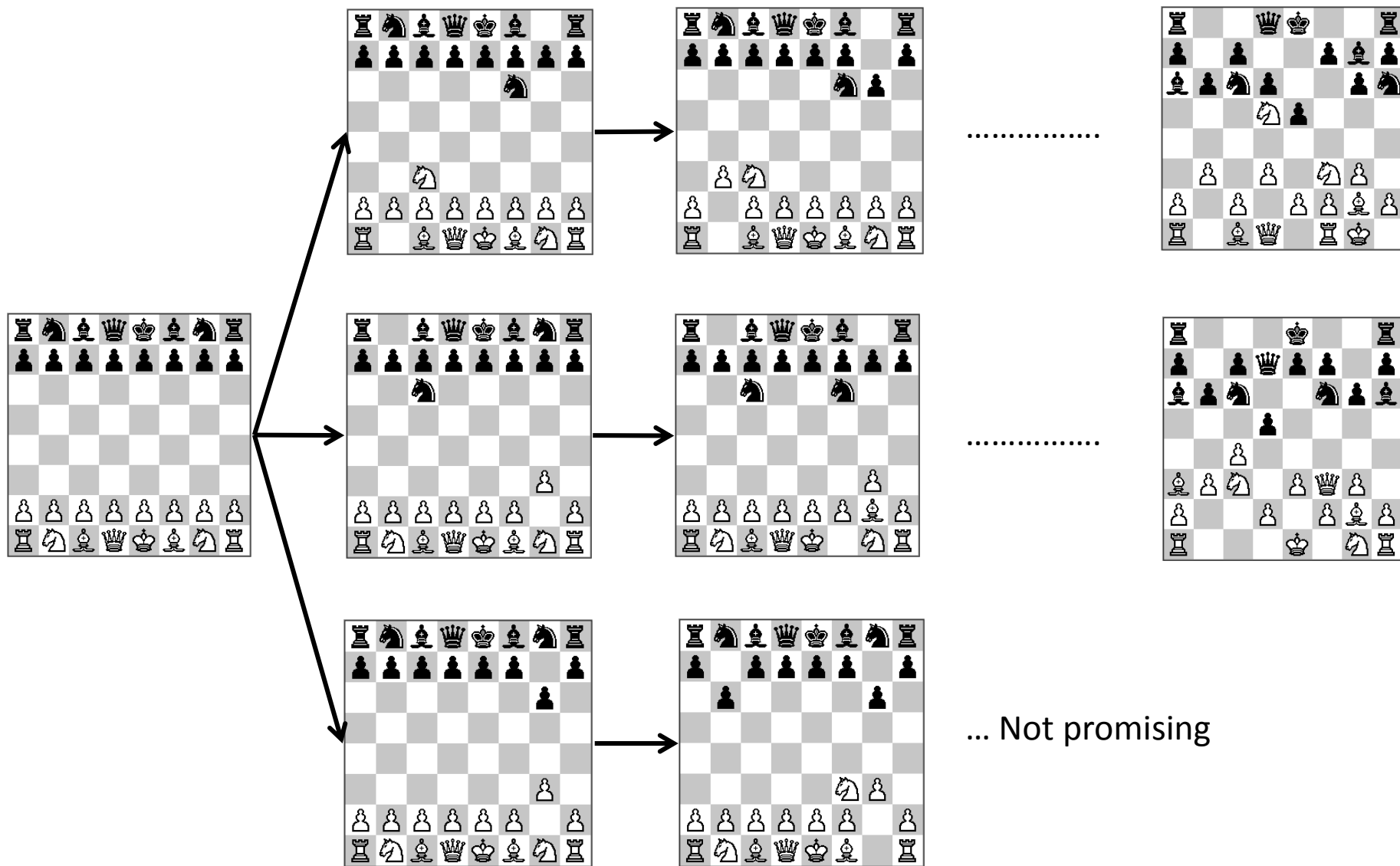
Types of Decompositions

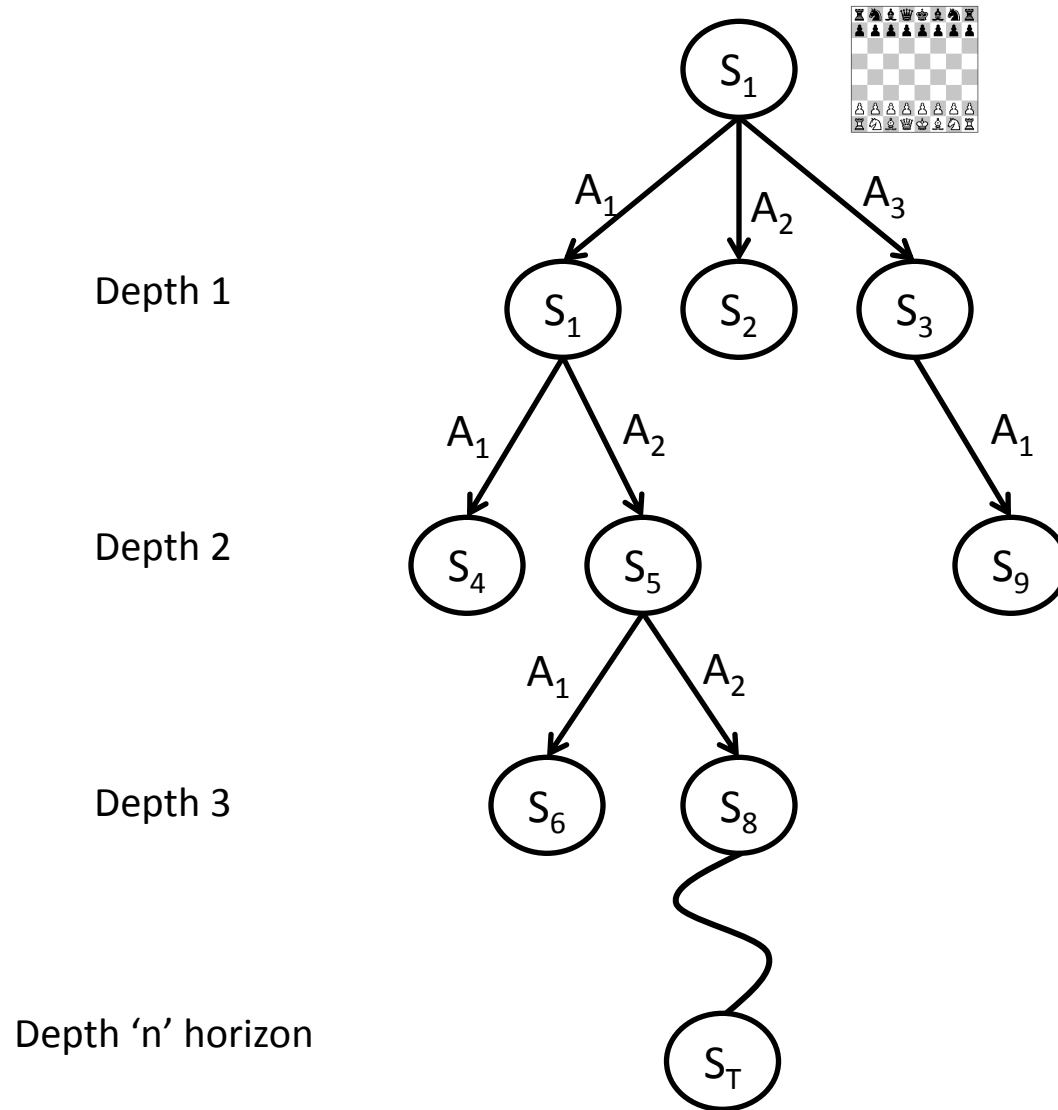
- Things-to-do: **Options**
 - Offer coherent, near-optimal sequences of actions for solving subtasks
 - For example “go to the closest food”
- Things-not-to-do: **Constraints**
 - Indicate sequences of actions that should be taken to stay alive within the domain
 - For example “avoid ghost”

Tic-Tac-Toe

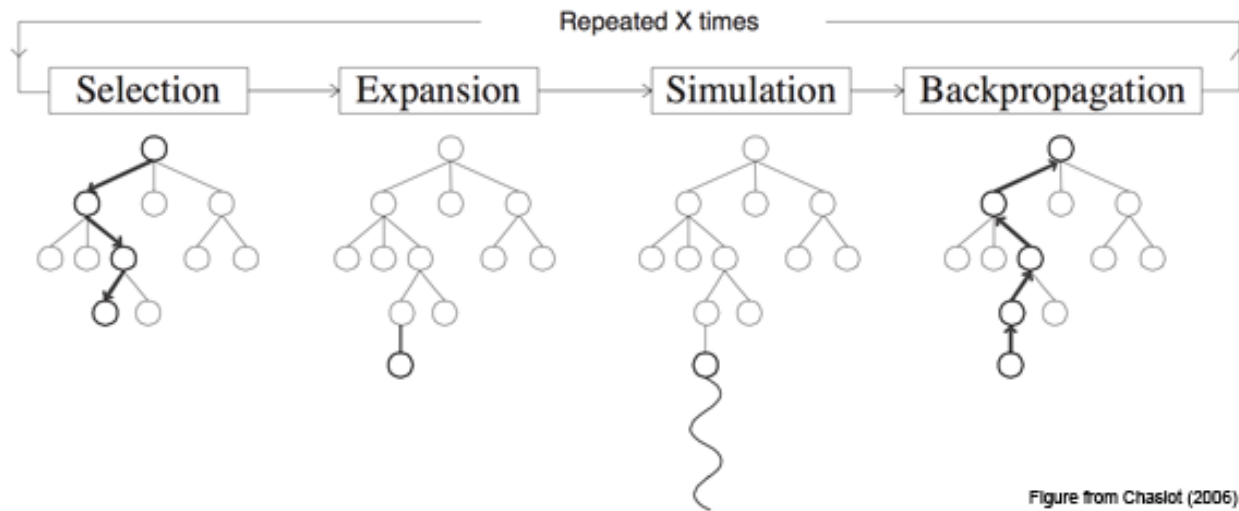
Chess







MCTS



MCTS

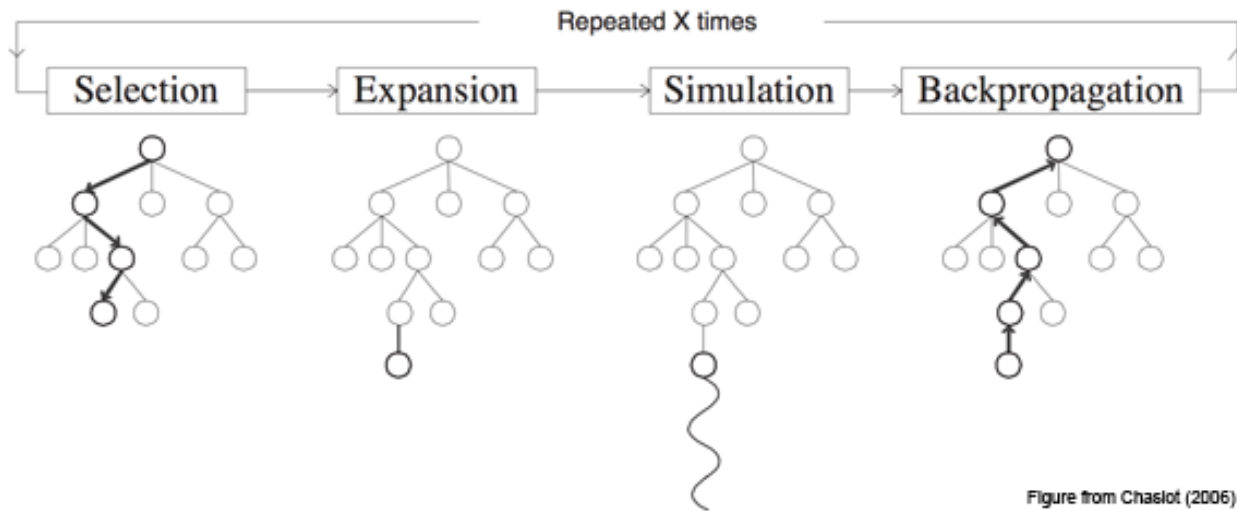


Figure from Chaslot (2006)

Useful in problems with **large state spaces**

Requires **lots of samples** to get a good estimate

Planning time **independent** of the total number of the states

Running time **exponential** in the effective horizon (H)