

AI in Games: MCTS

Daniel Hernandez & Peter York

```
>> git clone https://github.com/Danielhp95/ai-in-games-mcts
```

Install Jupyter as shown at (google jupyter install):

<https://jupyter.readthedocs.io/en/latest/install.html>

```
>> pip install jupyter
```

EPSRC

Engineering and Physical Sciences
Research Council



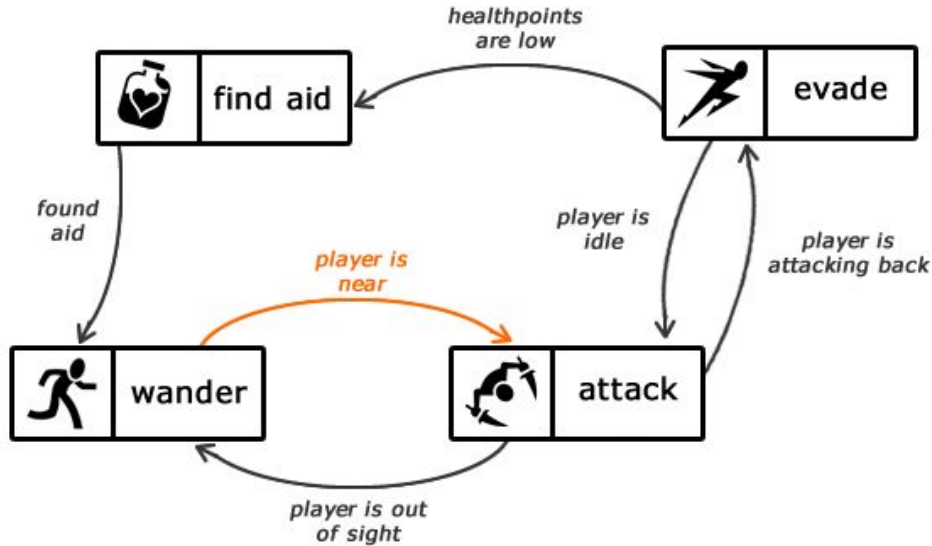
UNIVERSITY
of York

iGGi

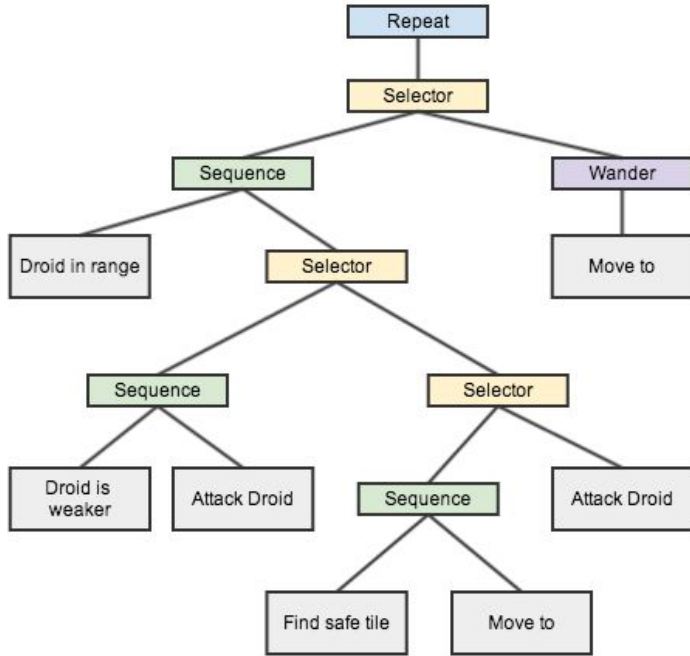
Your future in
games research

Current state of the art in
commercial games

The Current State of the Art - Finite-State Machines

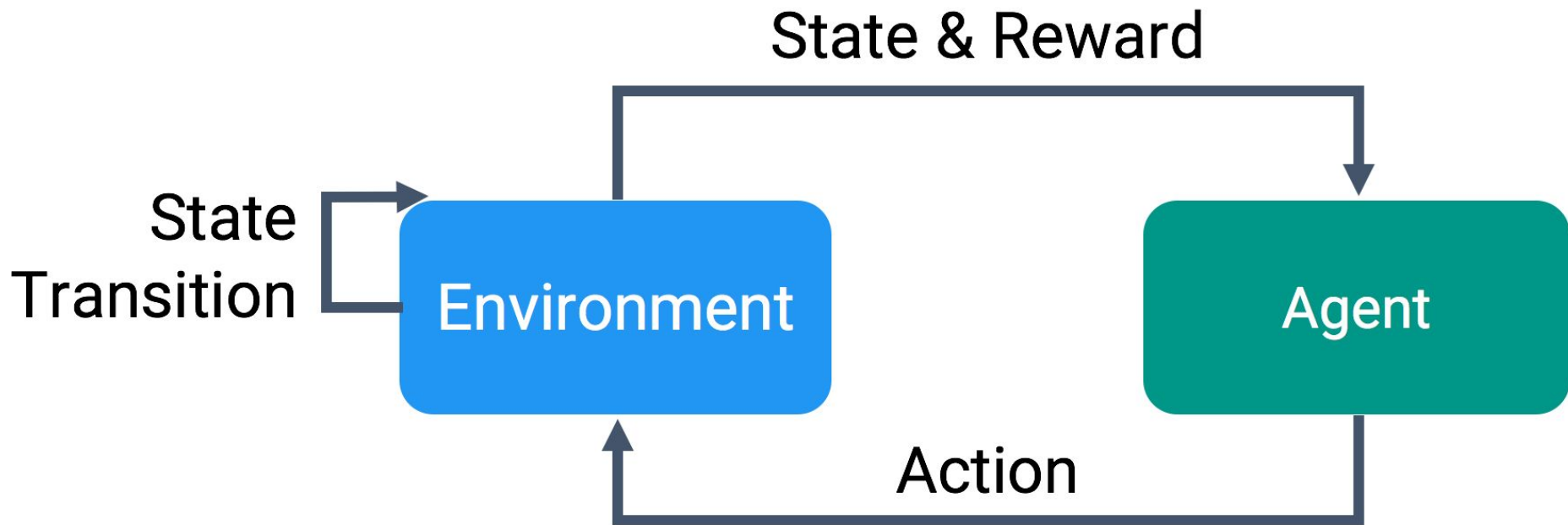


The Current State of the Art - Behaviour Trees

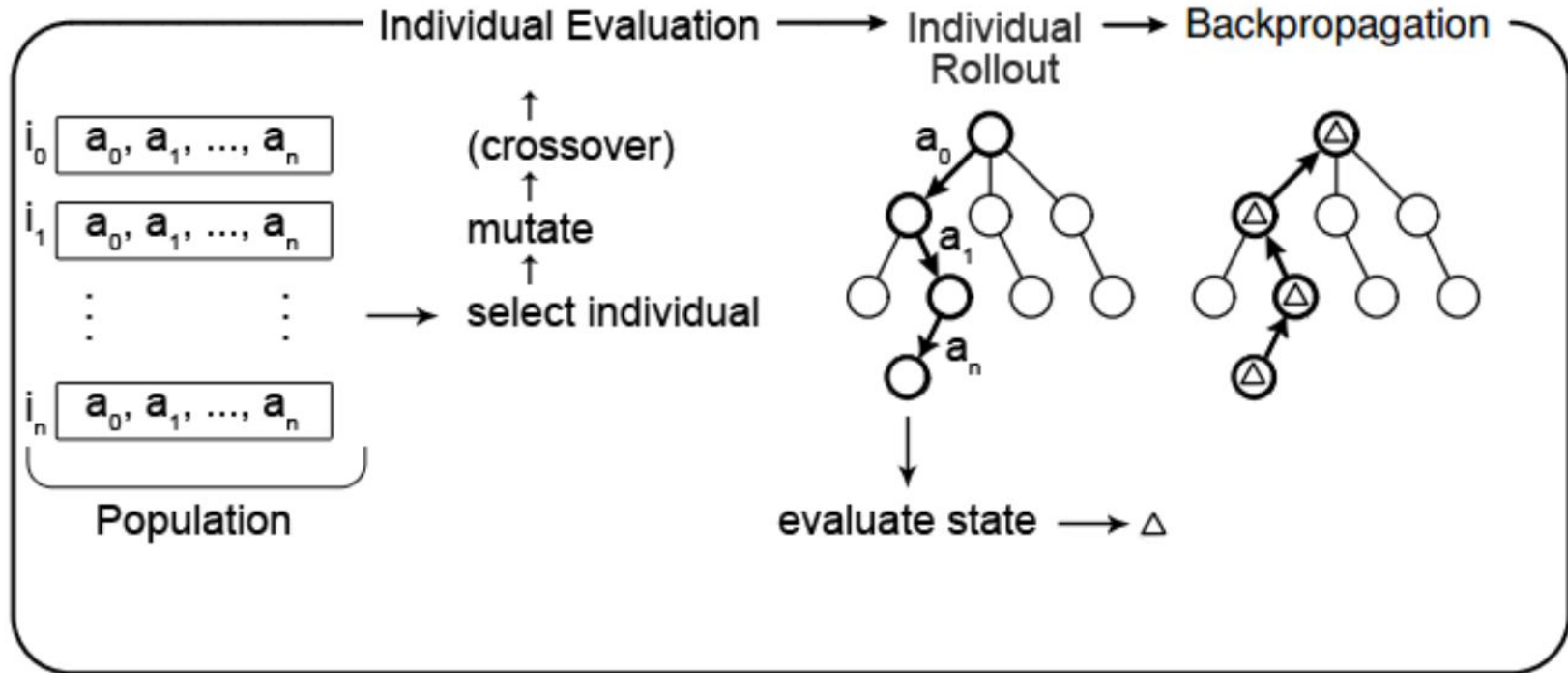


Moving Away from Scripted Behaviour

Reinforcement Learning

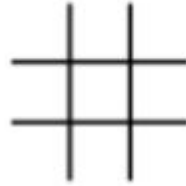


Evolutionary Algorithms

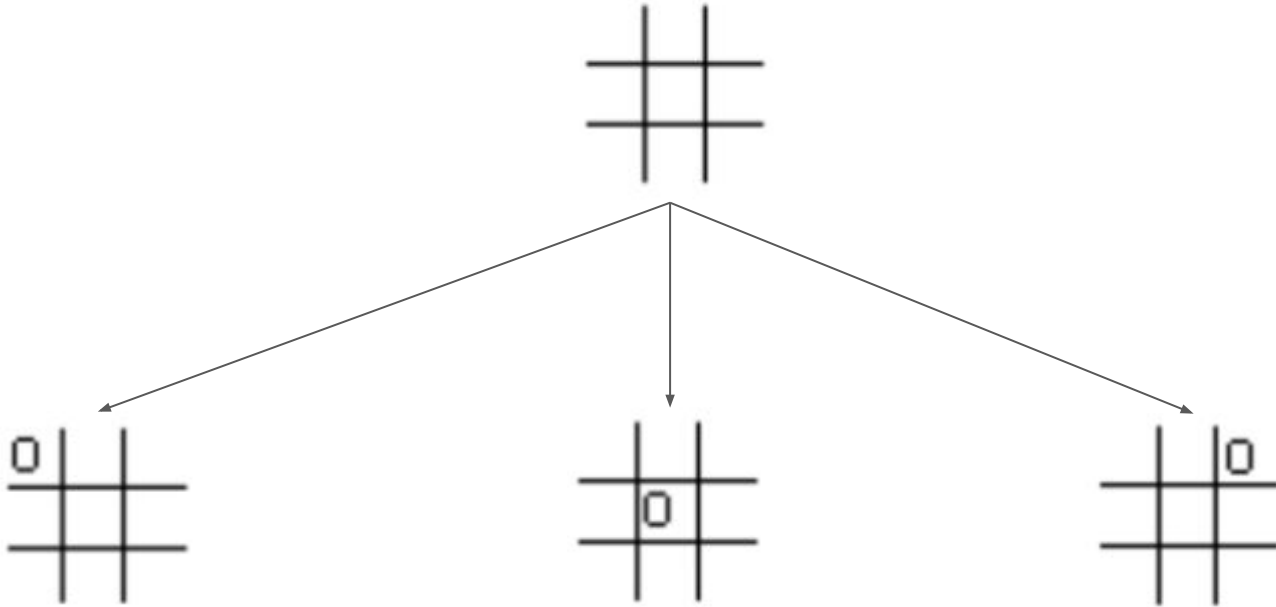


Tree-Search-Based Techniques

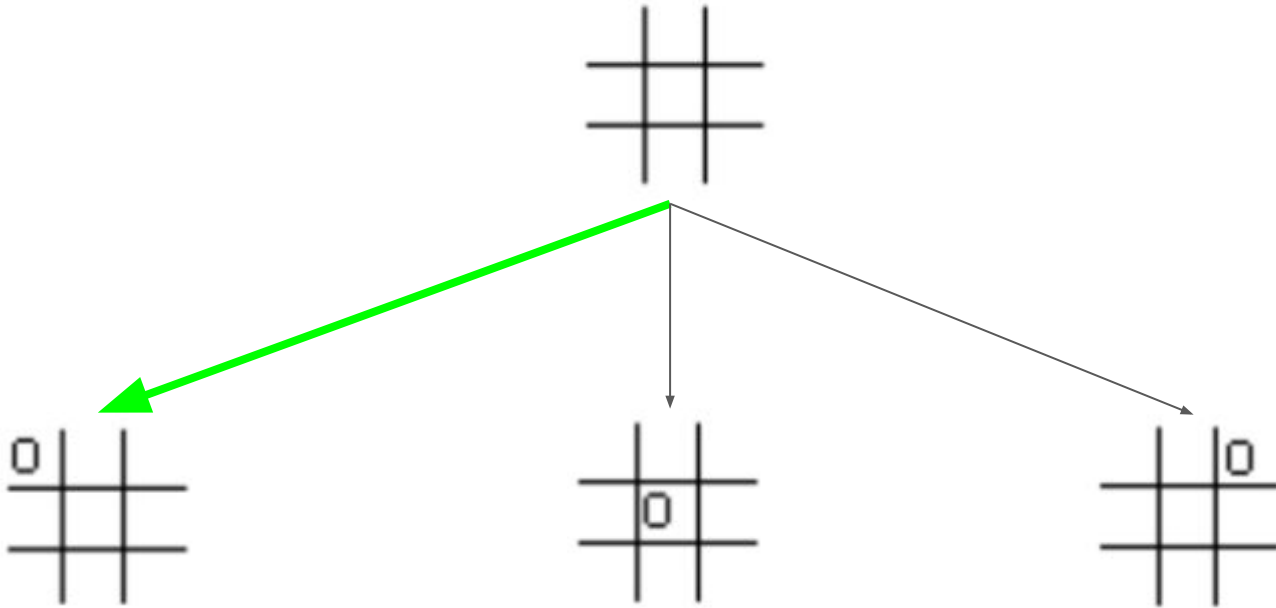
Tree-Search-Based Techniques



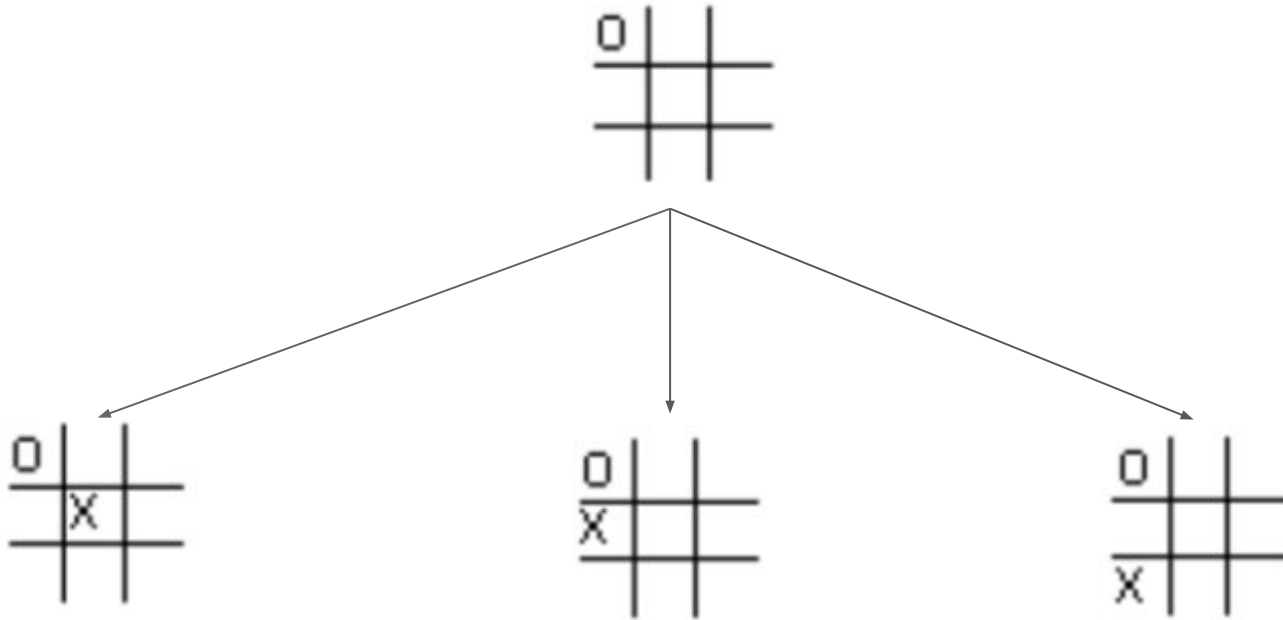
Tree-Search-Based Techniques



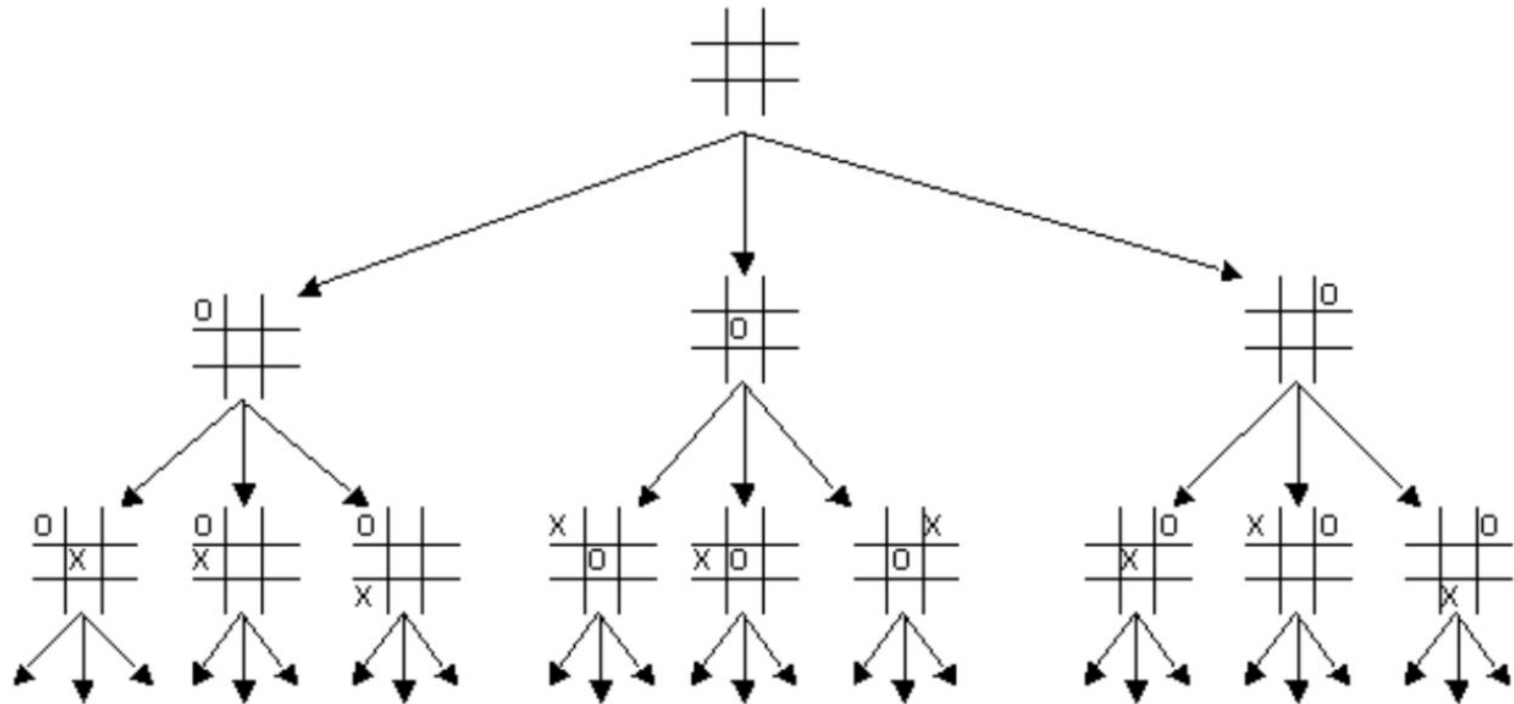
Tree-Search-Based Techniques



Tree-Search-Based Techniques

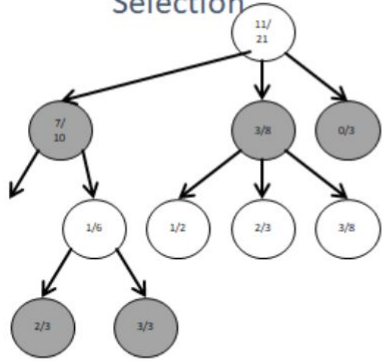


Tree-Search-Based Techniques

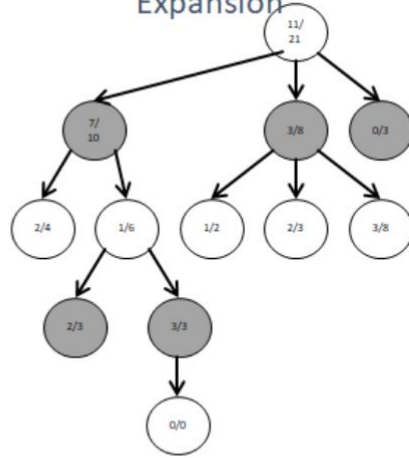


Monte-Carlo Tree Search

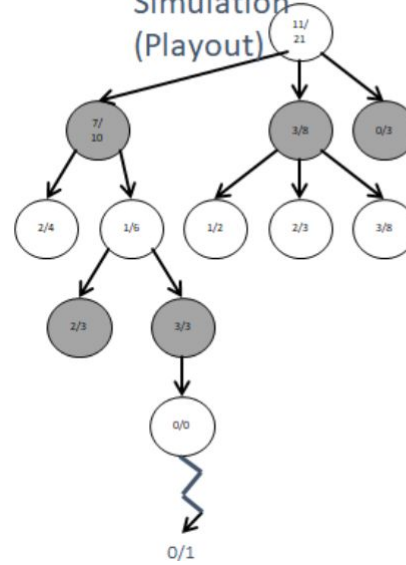
Selection



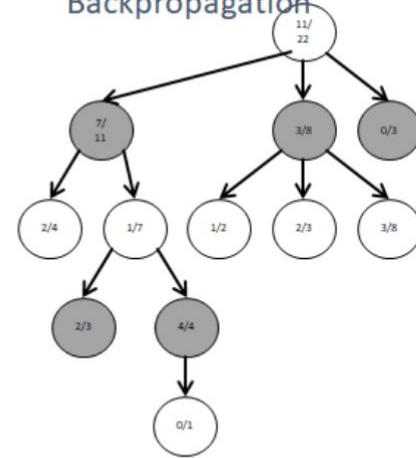
Expansion



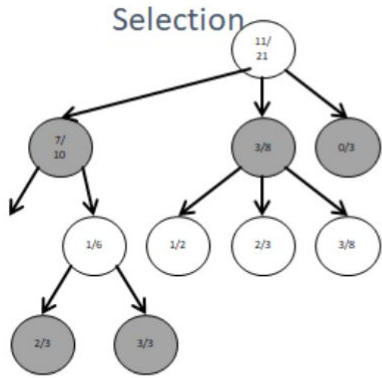
Simulation
(Payout)



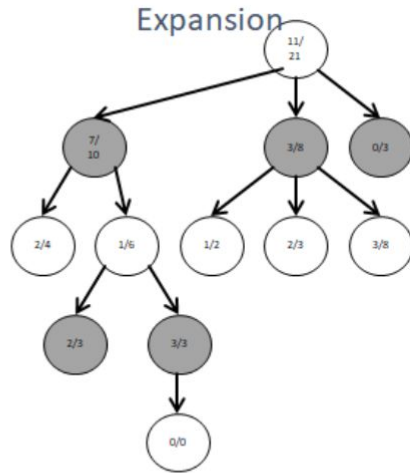
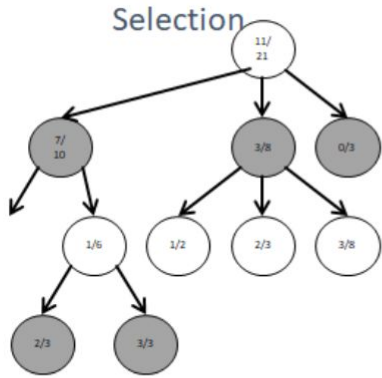
Backpropagation



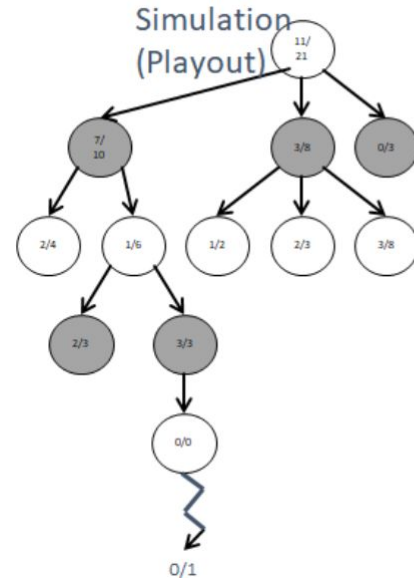
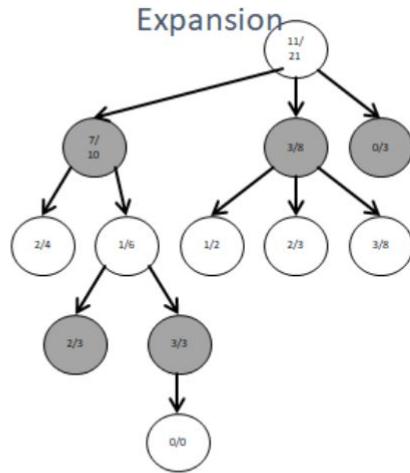
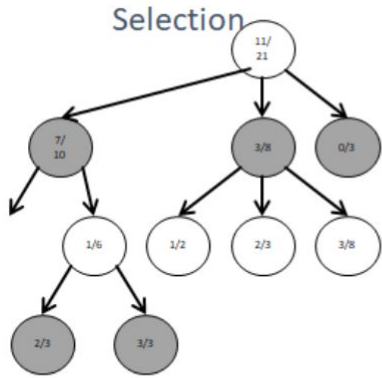
Monte-Carlo Tree Search



Monte-Carlo Tree Search

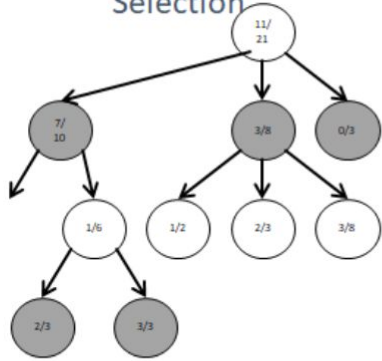


Monte-Carlo Tree Search

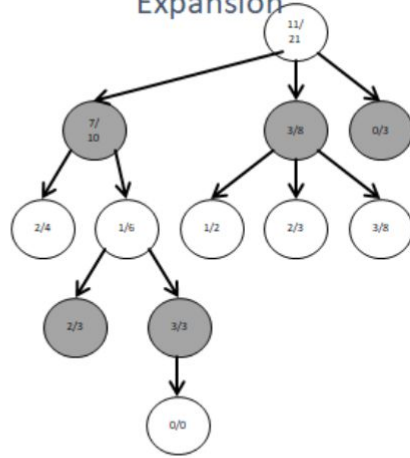


Monte-Carlo Tree Search

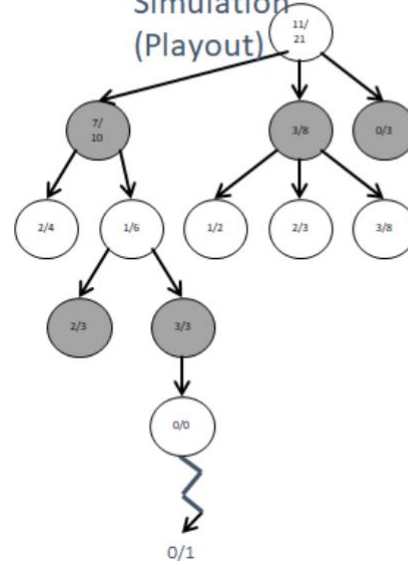
Selection



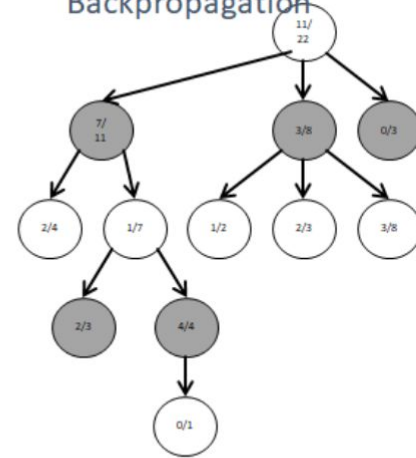
Expansion



Simulation
(Payout)

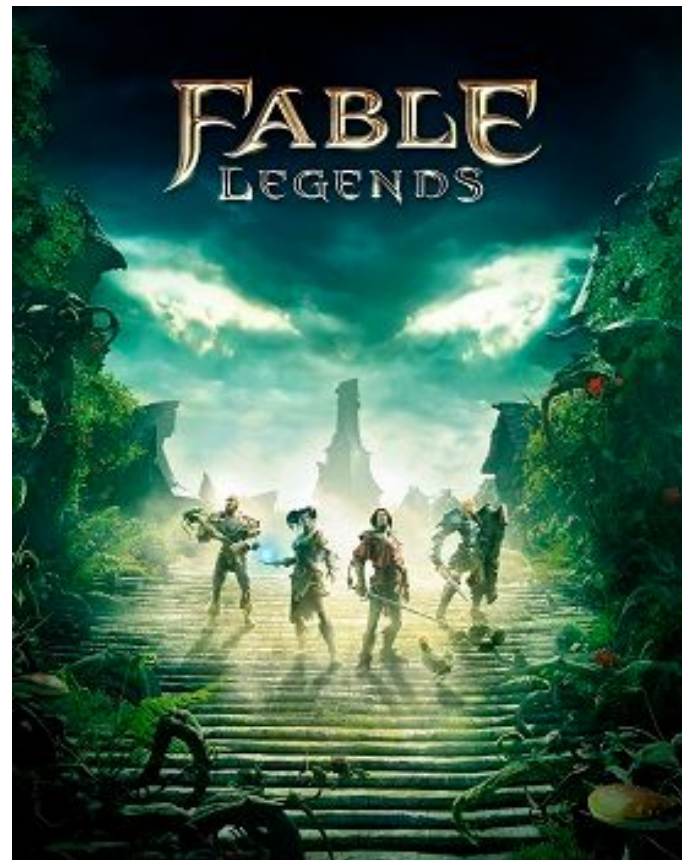


Backpropagation



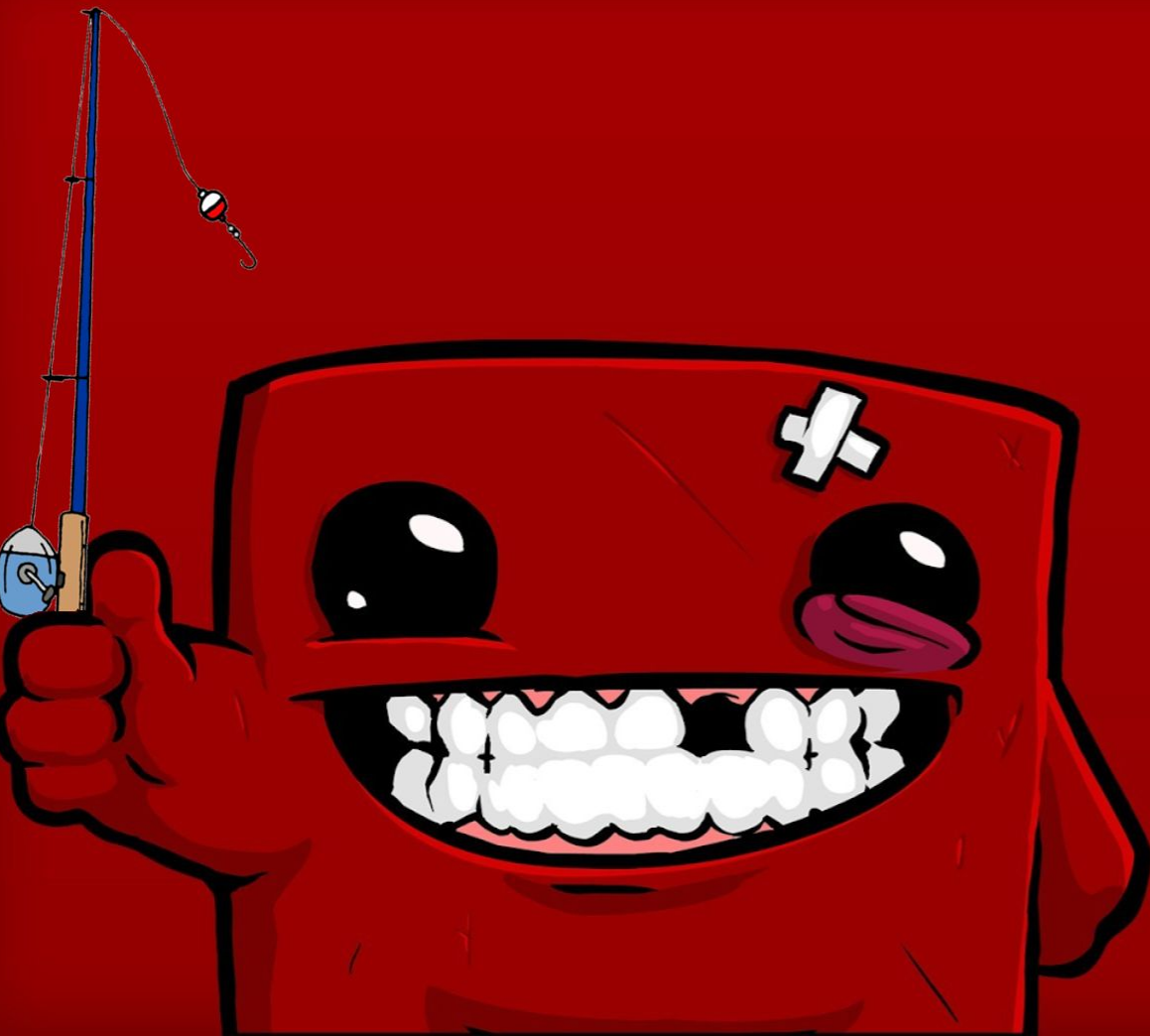


Usage of MCTS in the Wild





Teach a man how to fish



MCTS in Total War



MCTS in Spades



MCTS in Fable Legends



Pros and Cons of MCTS for Commercial Games

Pros

- Game agnostic
- Robust with respect to game updates

Cons

- Model-Based, i.e. you have to abstract, state and actions space, and time
- Authorial control
- Processing cost

Thanks for coming!



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Your future in
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