# Comp320 Research Artifact

Alastair Rayner

January 8, 2018

## My Research questions I aim to answer

▶ How does game tree search techniques compare for GVGAI?

- How does game tree search techniques compare for GVGAI?
- Where does each tree search technique do well in each game?

- ▶ How does game tree search techniques compare for GVGAI?
- Where does each tree search technique do well in each game?
- ▶ What are the strengths and weaknesses of different search techniques and how can they be improved?

- How does game tree search techniques compare for GVGAI?
- Where does each tree search technique do well in each game?
- What are the strengths and weaknesses of different search techniques and how can they be improved?
- Can visualizing the actions an agent will take in the competition lead to

- ▶ How does game tree search techniques compare for GVGAI?
- Where does each tree search technique do well in each game?
- What are the strengths and weaknesses of different search techniques and how can they be improved?
- Can visualizing the actions an agent will take in the competition lead to
- ► How can the scaling of different metrics within the competition affect different tree search algorithms

- ▶ How does game tree search techniques compare for GVGAI?
- Where does each tree search technique do well in each game?
- What are the strengths and weaknesses of different search techniques and how can they be improved?
- Can visualizing the actions an agent will take in the competition lead to
- ► How can the scaling of different metrics within the competition affect different tree search algorithms

The Goal

#### The Goal

➤ To create a hyper heuristic agent that has been modified from the strengths and weaknesses found in different tree search techniques.

#### The Goal

- ➤ To create a hyper heuristic agent that has been modified from the strengths and weaknesses found in different tree search techniques.
- ► The current aim is to visualize the search space of an algorithm and look for the strengths in particular games and scenarios.

#### The Goal

- ➤ To create a hyper heuristic agent that has been modified from the strengths and weaknesses found in different tree search techniques.
- ► The current aim is to visualize the search space of an algorithm and look for the strengths in particular games and scenarios.

Visualizations for the GVG-AI Competition

## Visualizations for the GVG-AI Competition

One of my main focuses this far is to get visualizations rendering over the competition.

### Visualizations for the GVG-AI Competition

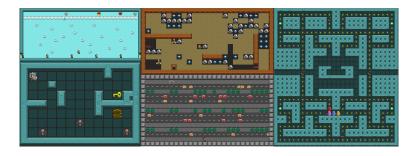
- One of my main focuses this far is to get visualizations rendering over the competition.
- ► This will help facilitate the data collection about the strengths and weaknesses of different search algorithms

## Visualizations for the GVG-AI Competition

- One of my main focuses this far is to get visualizations rendering over the competition.
- ► This will help facilitate the data collection about the strengths and weaknesses of different search algorithms
- Being able to visualize where the agent is planning to go and finds most interesting/valuable to explore can help to creating an hyper heuristic that will search the right places(REWORD).

# Demo of the GVG-AI competition

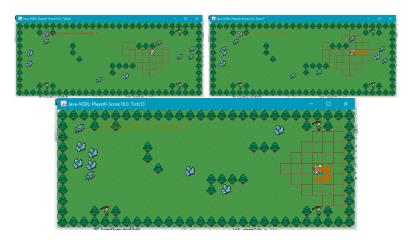
### **Example Games**



Angles, BoulderDash, Pac-man, Zelda, Frogger.

## Demo of the GVG-AI visualizations

# **Example of MCTS visualisations**



# Demo of the GVG-AI competition and visualizations

Live Demo