ARTIFICIAL INTELLIGENCE

DREXEL UNIVERSITY College of Computing & Informatics

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RETHink at DREXEL UNIVERSITY

Overview

Artificial Intelligence

How can one create AI's that effectively play real time, deterministic video games? In order to better understand this question, microRTS, a real time strategy game, was developed. MicroRTS implements a variety of hard coded AI's which can be played against and evaluated to determine the AI's prowess as a game player. This research demonstrates the limitations of hard coded AI and transitions into the need for Machine Learning or Intelligent AI.

microRTS

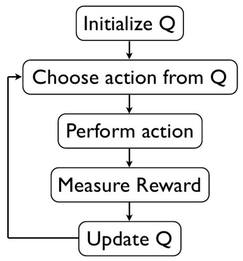
Minimalist Real-Time Strategy Game designed for AI Research

Project Objectives

- **Understand the game play and functionality of microRTS**
- **Develop lesson plans to introduce students to AI while using microRTS as an engagement tool**
- **Develop materials to demonstrate AI and machine learning through hands-on activities**
- **Use microRTS to facilitate student understanding of concepts learned in their programming class and begin to possibly delve into coding their own AI**
- **Discuss Open Source Coding and the need for documentation when others are contributing to their code**

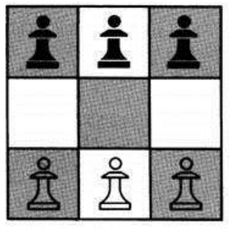
Activities

Creating an Algorithm Activity – Tic-Tac-Toe (cs4fun)



Explaining Q-Learning

Hexapawn Demo w/Machine Learning – Reward Activity (cs4fun)

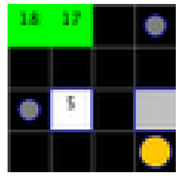


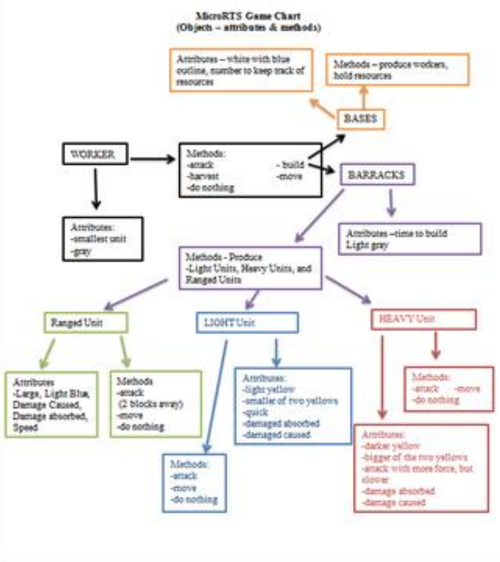
Play microRTS to understand AI

In game analysis questions

Describe algorithms to roam, attack and build units on playing grid

Deciphering the Code Activity





Understanding Objects in microRTS

- A review of Object Oriented Programming

Course Materials

CS Principles Big Ideas: Big Data, Algorithms & Machine Learning

Artificial Intelligence PPT

Handouts and Questions for use during PPT, Activities, and Demos

Hands-on demos as reinforcement of material in PPT

Easy to use package for microRTS including installation instructions (Eclipse & NetBeans)

Tutorial File (video and hard copy) for understanding and playing microRTS

Plans/Tutorials for AI Projects using Finch Robots, Lego Mindstorm, and E-Textiles

Future Work

Expansion in regards to the use of Robots and E-Textiles during the AI Unit

Lego Mindstorm, Finch Robots, & E-Textiles!

Programming One's Own AI in microRTS

Acknowledgements

RETHink@Drexel
Research Experiences for Teachers in Engineering and Computer Science: Machine Learning, Big Data and CS Principles

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