# Artificial Intelligence – Minutes and Todo

## Week 5

**Minutes**

Introductions.

Discussion on potential games we could implement for the project.

Discussion on potential algorithms we could use for the project.

Wednesday chosen as the idea

**Todo**

Each member of the team to suggest at least one game next week, along with an existing github environment where some sort of algorithm has been achieved for this game.

## Week 6

**Minutes**

Matt suggested Space Invaders as a potential game to write an AI for. Showed an example of a genetic algorithm.

Sherwin suggested Snake, and showed an example of a graph search algorithm solving it.

Aaron suggested 2048, and showed an example of deep reinforcement learning solving it.

Ashlynn suggested a variety of board games, including rummikub and scrabble, along with some deep reinforcement solvers for each.

**Todo**

For our next meeting, each member of the team is to investigate whether their chosen games can facilitate at least three different types of algorithms that are fundamentally different.

## Week 7

**Minutes**

Matt suggested Space Invaders as a potential game to write an AI for. Showed an example of a genetic algorithm.

Sherwin suggested Snake, and showed an example of a graph search algorithm solving it.

Aaron suggested 2048, and showed an example of deep reinforcement learning solving it.

Ashlynn suggested a variety of board games, including rummikub and scrabble, along with some deep reinforcement solvers for each.

**Todo**

For our next meeting, each member of the team is to investigate whether their chosen games can facilitate at least three different types of algorithms that are fundamentally different.

## Week 8

**Minutes**

We had a discussion on the possibility of applying different algorithms to our suggestions in the previous week.

We decided snake would be the most versatile, and could find good examples of genetic, graph search and deep reinforcement algorithms applied to the game.

We divided up our work by algorithm.

**Todo**

Matt – To work on the genetic algorithm

Sherwin and Ashlynn – to work on the deep reinforcement algorithm

Sherwin – to email the professor about our choice of game and algorithm.

Aaron – to work on the graph-search algorithm

## Week 9

**Minutes**

We discussed our preliminary research on each of our respective algorithms.

We decided on a common snake environment to use, suggested by Ashlynn, which contains the game logic and takes advantage of openAI gym. It uses Turtle and Tkinter to draw the game on screen:

<https://github.com/henniedeharder/snake>

We agreed to set up a github repo for the project.

**Todo**

Sherwin – To setup a github and send the details to the professor

Matt – To adjust the provided environment to work with the genetic algorithm

Sherwin and Ashlynn – extend the deep reinforcement network contained in the environment

Aaron – implement a graph-search algorithm that works with the chosen environment

## Week 10

**Minutes**

Matt – has a basic version of the genetic algorithm working, but the weights are not being carried over generations. Will debug with Ashlynn during the week.

Sherwin – will extend reinforcement learning with double deep q network

Aaron – could not make it due to a deadline, but let us know that the graph search is about a third complete

**Todo**

Sherwin – Continue work on double deep q network

Matt – To troubleshoot with Ashlynn on the weights problem

Aaron – to continue work on the graph search

## Week 11

**Minutes**

Matt – provided demo of genetic algorithm. Currently having problems with looping snakes, and takes too long to train (at least a week). Will investigate running in parallel for next week.

Aaron – provided demo of graph search algorithm, will tweak some parameters to improve further.

Sherwin – basic version of double q complete – results will be ready for next week

Divided sections on report:

Ashlynn – abstract, intro and lit review

Matt, Sherwin, Aaron – all parts relevant to respective algorithms for the remainder of the paper

**Todo**

Matt – rewrite the algorithm to work in parallel, fix looping snakes (likely fitness function)

Aaron – tweak parameters further and report results

Ashlynn – lit review, intro and abstract

Sherwin – finish double q and report results

## Week 12

**Minutes**

Matt – genetic algorithm now works in parallel, re-weighting of fitness function fixed the infinite snake problem. Now takes a few hours to train. Will add description and results.

Aaron – Graph search is perfected, will add description and results

Sherwin – deep q ready, will add description and results.

Agreed to meet at the weekend to record presentation and finalise report.

**Todo**

Matt – report results and add any missing descriptions. Add slide on genetic.

Aaron – report results and add any missing descriptions. Add slide on graph search.

Sherwin – report results and add any missing descriptions. Add slide on deep q.