

## 1. Abstract

- (a) Your abstract should be a 150 - 250 word summary of your report. It should cover : 1) the overall purpose of report 2) the basic design of your study/research —what did you do? 3) any major findings or trends you found as a result of your analysis; and, 4) a brief summary of your conclusions. You have some of these components but not all.
- (b) I think you can remove the following “...which will hopefully simulate coordination between ghosts and maximise the performance measure of winning the game by catching pacman. This will in turn hopefully pave the way to inspiring the use of market-based approaches in different domains of Artificial Intelligence. ...”
- (c) “...the ghost with the highest probability of catching pacman...” —so the ghost submit their probability of catching Pacman as their bid?

## 2. Introduction

- (a) “The objective is to control a team of ghosts as the focal agents to communicate with each other through auctions - the type of which will be determined next chapter - which will in turn coordinate predator behaviours to catch Pacman as efficiently as possible.” —this sentence is poorly written it needs to be fixed. Is this two sentences?
- (b) “This method will be compared to existing traditional methods of predator behaviour in Pacman,” —You can state what those methods are since few people know the *traditional* methods used to control the ghost.

- (c) I think your intro. should start with section 1.2 (you can remove the header). This section reads more like an intro. than your first paragraph. It would be great if you could make section 1.2 your first paragraph, add a new 2nd paragraph expanding on the new paragraph 1, and then use your current first paragraph as a 3rd paragraph. For example,

*Multiagent Systems allows multiple intelligent agents to communicate and coordinate a set of tasks to complete an overall objective as a team....*

*[NEW PARAGRAPH]*

*Distributed Artificial Intelligence is a key area of research in Artificial Intelligence in recent years, with many papers published as of late....*

*This project aims to use Market-Based algorithms in a Multiagent System to coordinate multiple entities in a software system....*

### 3. Background & Literature

- (a) You have two Figure 1s
- (b) You have to reference all figures in your text. Meaning, if you have a Figure X, then somewhere in your text you have to mention/discuss Figure X. You haven't done that with Figure 1 and some figures in your results section
- (c) “ *If the player manages to collect a capsule, every ghost changes into a “scared” state making all of them head towards their respective , where the player can “eat” the ghosts if they collide (instead of losing if the ghosts are not scared).*  ”  
—Something not write with this sentence. Do you mean : *If the player manages to collect a capsule, every ghost changes into a scared state. In the scared state ghost immediately head back to a staging area. Also, during this state Pacman can eat the ghost.*
- (d) In the section where you describe the ghost behaviours, you should mention that this is one of the ‘traditional’ approaches to ghost behaviour
- (e) Make sure to fix all of the captions (in your figures) —captions should describe the figure in complete sentences.
- (f) “ *However there are a few other additional quality of life extensions included to allow for ease of expansion, which will be explained later on.* ” —quality of life extensions? change the wording here.
- (g) Make sure to use the same terminology throughout your report, e.g., if you define *power-up* in one section make sure to use the word *power-up* when referring to *power-ups* in other sections.

- (h) “*The Pacman game model can be easily represented as a Multiagent System (MAS),*” —keep your opinions out of this, how do you know it’s easy, better : “*The Pacman game model can be represented as a Multiagent System (MAS),*”
- (i) You should define *toroidal world*.
- (j) “*There are extremely basic implementations of pacman that are included in the package, which are the pacman ‘agents’ that control pacman differently to each other.*” —wording, remove the words *extremely basic*.
- (k) “*- which as stated by the name -*” —this is not what hyphens are used for, stop using hyphens like this, I think you need one or more commas in this sentence
- (l) “*Nonetheless, ... complexity of the ruleset.*” —what rule set?
- (m) On pg. 18, it reads like you’re assessing the Random Agent performance. You can’t do that here; that defeats the purpose of running experiments. Did you use RandomAgent, yes or no? If yes, explain how it works without evaluating it’s performance. If you didn’t use the RandomAgent agent then there’s no reason to discuss it here.
- (n) What does section 2.3.2 have to do with your project? I don’t see the connection.
- (o) Pg. 20, there a sudden shift in topic here “*The performance measure of each agent can be collected by measuring the distance of each agent from Pac-Man.*”; I think this should be a new paragraph.
- (p) You should cite your source for the description of the English/Japanese/Dutch/Blind auction
- (q) Section 2.3.4 begins with “The second challenge...” —what was the first?
- (r) It doesn’t make any sense to me to have the Auction material as a subsection of Multiagent Systems

#### 4. Chapter 3

- (a) Make sure your algorithms fit on a single page, e.g., Algorithm 1 spans 2 pages instead of one.
- (b) Pg. 25, reads more like your thought process which is not what you want to discuss here, discuss the implementation, for example :  
*The agent or ghost will chase Pacman if given the Chase task. The ghost is given state information which includes the exact coordinates of Pacman. The UC Berkeley package has a chase algorithm, Algorithm 1.*
- (c) Try not to use words or phrases such as obvious, we can, or fortunately
- (d) Pg. 27, the pseudocode should be numbered so that you can refer to it in your text

- (e) There's too much text about the Pacman package, focus on what you've implemented. The title of this chapter is 'Market-Based Multiagent Coordination' which is not part of the pacman package so there shouldn't be much text about the package. For example, "In the UC Berkeley implementation, each ghost agent is assigned a specific index number at initialisation. Since Pac-Man itself also counts as an agent in the package, it is given an index value of 0. Remaining ghosts are assigned index values 1 onwards up to 4." —you can remove this.
- (f) Another example, from pg. 28, "...and obtainable in the game package."
- (g) Remove this : "Imagine a scenario where an environment that closely resembles a complex maze, where a Breadth First Search returns the worst case scenario which expands every single space on the map. Now imagine 4 agents perform this search on an updated game state every single game state. This would massively slowdown the performance of the system." —what's a complex maze? why BFS? would it really be slow?
- (h) "If an auction is called every game tick, the auction will get the most up-to-date information about the state of the game." —this isn't worded properly. Regardless of when the auction takes there's no reason for the information to be stale. State information is retrieved whenever the auction takes place which means it's always up-to-date.
- (i) "Because of the nature of the UC Berkeley package, the game runs in increments called 'ticks', " —you're referring to the package again.
- (j) The if-statement for triggering auctions is NOT an algorithm
- (k) On pg. 31, you have a chunk of pseudocode, is it discussed anywhere?

## 5. Chapter 4

- (a) First sentence : "This chapter will outline the testing and experiments carried out on the UC Berkeley version of Pac-Man." —delete this; better would be : "This chapter will outline the testing and experiments carried out to evaluate a market-based coordination system for ghosts in Pacman."
- (b) Pg. 32, this is the first time you've mentioned MDP Pacman agent, you have to define this somewhere
- (c) If DirectionalGhost and RandomGhost are explained somewhere, you don't have to mention that they're part of the package again.
- (d) You should state somewhere that DirectionalGhost and RandomGhost are used as benchmarks
- (e) pg. 33, remove 'UC Berkeley package'
- (f) "Here, charts will be extrapolated from the mass amounts of data retrieved from all of the tests." —remove the word *mass*.

- (g) In Table 7, win rate, is that Pacman's win rate or the Ghost's win rate?
- (h) Why is the Auction min and Auction max included in Figure 5? —You can't include these amongst the other averages.
- (i) Where's directional ghost in Table 7 and Figure 5?