

# **The use of different artificially intelligent agents in software development using different programming paradigms.**

**COMP130 - Software Development**

1702208

March 19, 2018

Please include an abstract of at most 100 words (these do not count towards your word count). In this paper, the author is going to discuss the use of different artificially intelligent agents in software development using different approaches. This includes five agents classified by Stuart Russell and Peter Norvig (CITE): 1) Simple reflex agent; 2) Model-based reflex agent; 3) Goal-based agent; 4) Utility-based agent; 5) Learning agent. An agent is anything that can perceive its environment through sensors and act through actuators depending on the environment. This can be anything, starting from simple machines, such as thermostats (which are programmed to act depending on the conditions) to worms (which can learn a small repertoire of behaviour) to humans (who can learn very quickly).

# 1 Introduction

Throughout the last few centuries "computer" has become one of the most important and powerful technologies we have now. Therefore, the field of engineering has become very severe today. Software engineering refers to the disciplined and scientific approach to developing advanced software. The field has made a wide range of software that supports different systems and applications. Such are artificially intelligent agents, or autonomous agents, which are going to be discussed in this paper. Artificially intelligent agents are a big field in software development, as there are being produced very advanced systems using agents. This would improve and ease people's lives as well as developing games using complex artificial intelligent (AI) systems. Moreover, in this paper will be discussed what programming paradigms are better for this area. In addition, whether it is valuable to use such approaches. Conclusions will include how these agents can be used in software development.

## 2 Artificially intelligent agents

"An agent is anything that perceives an environment through sensors and acts upon it through effectors." (Russell and Norvig, p. 31) This can be anything, starting from simple machines, such as thermostats (which are programmed to act depending on the conditions) to worms (which can learn a small repertoire of behaviour) to humans (which can learn very quickly). The most basic agent is simple reflex one. It follow the *condition-action rule*, which is described as - if condition then action. This type of agents is not used in advanced software or game development. Rather they are used in everyday life, such as thermostat. To have some meaningful use in software, agents must, at least, have different algorithms, which will make

them act differently depending on the given task. Such can be considered as model-based agents. These have certain list of rules, which they follow to depending on the given task. Those rules are considered by the programmers beforehand, so it would not be flexible enough to execute random tasks. In addition, rules are executed as soon as it suits the condition, which doesn't usually lead to the best outcome. For this reason goal-based agents are introduced. Goal-based agents have the same list of rules, but they consider executing the best one to have the best outcome so that it reaches its goal faster. That way the flexibility and capabilities of the agent are expanded.

### **3 Your section title here**

Write the main body of your essay here. Add more sections if appropriate. You may choose to write about each of your three papers in its own section, or you may choose a different structure. Either way, remember that you are being assessed on technical insight and analysis: it is not enough to merely summarise the contents of the three papers. You must demonstrate the ability to make inferences beyond what is written in the papers, and to draw the three papers together into a single coherent narrative.

Your essay must make a clear recommendation, in terms of which of the three techniques you have reviewed is the best according to whichever metric or metrics you feel is most appropriate. You must justify your choice, backing it up with empirical evidence. However remember that an academic essay is not a murder mystery: you should already have briefly discussed your recommendation in the introduction and in other parts of the essay. Do not save it for a grand reveal at the end.

## **4 Conclusion**

Write your conclusion here. The conclusion should do more than summarise the essay, making clear the contribution of the work and highlighting key points, limitations, and outstanding questions. It should not introduce any new content or information.