School of Computer Science – Individual Coursework Issue Sheet

Session	2022/2023	**Semester**	Spring
Module Name	Designing Intelligent Agent	**Code**	COMP3071
Module Convenor	Rodney Petrus Balandong, El Ioini Nabil		

Coursework Name	Individual Coursework **Weight**: 100%
Coursework Overview	The coursework for this module revolves around several main components. The first involves designing intelligent autonomous agents and an environment where they can interact. In the second component, a task will be assigned to these agents. Finally, the results will be evaluated using experimental methods. A report must be submitted to present the findings, which should also provide context for the work.
Coursework Details and example	Here are a range of project ideas to consider. Although we encourage you to develop an original project idea, these examples are all acceptable options: • Investigate different coordination strategies and robot numbers using the "robot vacuum cleaner" discussed during the lab session. For example, compare robots that try to stay a fixed distance from each other, compared to sharing a map that they build up) • Conduct a user test to determine the most effective approach for ordering questions in a chatbot (e.g., contrast random, fixed, and planned methods). • Evaluate the performance of various trading strategies using the Bristol Stock Exchange system under varying levels of noise and uncertainty to determine their robustness. • Analyze the "avoid the cats" problem by comparing strategies that: warning the cats vs. moving out of the way, and learning when to act based on a simple statistical approach vs. a decision-tree approach. • Evaluate the effectiveness of A* search against genetic algorithms on planning a robot's movement around a mapped environment (e.g. a WiFi triangulation-generated map from class), and compare both against random wandering.
Deliverable (a brief description of what is to be handed in; e.g. 'software', 'report')	▪ A report. ▪ The solver's code ▪ Anything else that you think would be helpful for the markers, e.g. sample outputs from your system, a link to a brief video demonstrating it working, etc.
Format	▪ The report should be submitted in .pdf format. ▪ The solver code in a respected programming language file extension. For example, to submit a .py file if the solver was implemented in Python.

Issue Date	20 February 2023
Topic Approval	You should submit a description of your project idea (around a paragraph, 300 words, or more) on the Moodle page by 17:00 on the 16th March 2023.

	We will then give you feedback on whether the project is an acceptable one, and how it might be modified or improved. You do not have to wait until then before submitting your idea; we will start looking at them from beginning of March onwards. To include the following 7 elements when submitting the project proposal 1. Project Name: - Come out with a name that accurately reflects the problem that you are trying to address together with the possible solution that might consider. 2. Problem Statement: - Provide relevant details explaining about the issue you are addressing. As a starter, you can refer to blog explaining about how to generate proper problem statement https://scientific-publishing.webshop.elsevier.com/research-process/what-problem-statement-examples/ 3. Existing Solutions: - Identify existing solutions or applications that address the problem you've identified. Discuss their strengths and weaknesses, 4. Differentiation: - Explain how your solution might address the weakness of the existing solution. Highlight the benefits and advantages of your approach. You are strongly advised to cite relevant academic manuscripts to support your claims. 5. Research Questions: - Identify the key questions you need to answer to solve the problem. These questions should be clear, focused, and specific. Use them to guide your research and experimentation. 6. Experiments: - If you have any idea of experiments you would need to run to answer the research questions, briefly explain them. You can create a simple flowchart and briefly explain each stage. The stages include might but are not limited to the methodology, data collection techniques. It is also beneficial to have an idea of why the experiments are necessary and how they will help you address the problem. 7. Metrics: - Discuss the metrics you need to collect from the experiments to evaluate the success of your proposed solution. Be specific about the metrics and explain how they will be used to measure success.
Submission Date	Final report and code: By 1700 pm on 11th May 2023, you should submit the following. This may be extended if you have a support plan or extenuating circumstances.
Submission Mechanism	Both the report and code should be submitted as .pdf files via Moodle. For the code, please try your best to wrap all the functionalities in a single file. For example, if you are using Python to complete the coursework, you can store

	all the functions/classes within a single .py file. If this is not possible, kindly zip all the solver file extensions when attaching it in Moodle.
Late Policy	Late submissions will incur a penalty of 5% per working day, up to 17th May 2023, after which you will receive a mark of zero.
Feedback Date (default of 21 days of the published submission date will apply, if blank)	Report and solver code: The feedback will be provided during the oral interview OR via the individual Moodle page.

Instructions	The individual Coursework is also explained in the general coursework guide uploaded to Moodle. A FAQ will be maintained in Moodle. If you have questions, talk to the module convenor; answers to new questions will be added to the FAQ.
Assessment Criteria	**Part 1 Report (75%)** ▪ A report, around 2500 words (up to 3500 words if you need it) ▪ The report should consist of the following elements and in the following order **a) Research Title** - Come out with a name that accurately reflects the problem that you are trying to address together with the proposed solution. **b) Abstract (optional):** - The abstract of a research paper serves as a crucial summary, providing a concise overview of the main research question, methods, findings, and conclusions of the study, as well as an indication of the research topic's significance. - It must be written in a manner that is easy to comprehend for both experts and non-experts in the field and should not exceed the recommended word limit. - Additionally, the abstract should provide an overall evaluation of the paper in terms of the quality of the research and its originality. **c) Introduction (optional)** - The introduction of a research paper should serve as a comprehensive and short overview, providing a clear background of the research problem. - It must also clearly describe the research question and objectives of the study, and preferably the needs of the study. - Optionally, the introduction should give a preview of the paper's main sections which may help readers to have a clear idea of what to expect from the remainder of the paper. **d) Literature Review:**

- This section serves as a comprehensive and organized overview of the existing ideas, technologies, solutions, or applications that address the identified problem and also discusses their strengths and weaknesses.
- It is essential to provide a critical assessment and synthesis of the studies cited while linking them to the research questions at hand.

e) Experiment

- This section can be used to describe the steps taken to design the environment and agents that were used to address the research question.
- It can also highlight the technologies used and the challenges encountered during the implementation process.
- Furthermore, it is essential to explain how the experiments were set up and run.
- A simple flowchart can be created to demonstrate the methodology, data collection techniques, and other stages of the experiment.
- It is also important to explain the significance of the experiments, why they were necessary, and how they can help address the problem at hand.

f) Result

- presents the findings from the experiments.

g) Discussion

- A discussion of the question considering the experimental results. In your explanation, you should clarify how your proposed solution can address the limitations of existing solutions while emphasizing the benefits and advantages of your approach. It is strongly recommended that you cite relevant academic manuscripts to support your claims.

h) Conclusion

This is the report section for giving a clear summary of the main points of the work, reflecting on its successes and limitations, and briefly discussing how to extend the current works, approaches or evaluations if more time is allocated to complete the coursework.

i) Reference

List of references used in the report. While this is optional, it is recommended to apply the APA style of reference citation. See the APA documentation for more details https://apastyle.apa.org/

Presentation (15%)

- The presentation will be based on the poster.

	▪ Failing to attend the presentation will result in a mark of **ZERO** (0) for the coursework. ▪ The module convener will set a time slot for the presentation, and you may pick the preferred time at your convenience. More detail about the slot opening will be issued around the submission deadline. ▪ The presentation will take around 8~10 minutes and will be either: - 10 minutes recorded presentation about the individual coursework, OR, - 10 minutes face-to-face presentation about the individual coursework. - More information will be provided regarding the presentation format as this is subjected to logistic consideration. ▪ During the presentation, the agenda includes a presentation about your work guided by a poster, followed by Q&A related to the code and report. **Poster Design (10%)** ▪ The design and layout follow typical academic poster design.
How the Work will be Marked	Marking will take into account: • background research and how you have used it to contextualise your work • the choice of task environment and how you have used it/adapted it for your specific project • the effective use of artificial intelligence and agent-based systems ideas from the course and your wider studies in designing your autonomous agents • how clear your question(s) are, how well the experiments have been designed to answer them, and your level of rigour in planning and analysing the experiments • how well the report answers the question by using the evidence from the experiments • the overall clarity and structure of the report, appropriate use of scientific and technical English, and the quality of charts, diagrams, pseudocode where relevant • the quality of reflection on the successes and limitations of the work • The structure of the presentation, the clarity of explanations, and good use of slides or other visual aids
Grading Guidelines	**Band: 90-100** Marks in this range are reserved for a superb all-around performance. Work done in all aspects of the project go beyond even high expectations. The student has shown a thorough understanding of the problem. All expected tasks have been successfully completed, the project shows depth and engagement with research ideas, and everything has been completed to a high standard. The report could form the basis of a publishable conference/workshop paper. **Band: 80-89**

	Excellent contributions to all areas of the project. The program and the report exceed expectations; for example, extra functionality is implemented, interesting analysis is performed, et cetera. Exceeded expectations in some areas. Demonstrates knowledge and understanding of the project beyond standard resources covered in the module. A clear appreciation of the project as a whole, its adequacies, limitations and possibilities for future development. The project demonstrates insight and depth beyond that usually expected in undergraduate work. **Band: 70-79** Very good contributions to all areas of the project. All the requirements are met: the solver performs as expected, and the report adequately reflects the work. Able to reflect accurately on the adequacy and limitations of the project's achievements. **Band: 60-69** Good appreciation of background. A good attempt at applying this to the task, with demonstrated ability to cope with difficulties. Good technical skills in several areas. While most of the requirements are met, the solver mainly performs as expected, and the report adequately reflects the work. It might come a little short in some areas—good reflective understanding of the project. **Band: 50-59** The core task is met, albeit with minor weaknesses: satisfactory background reading and a competent attempt at their tasks. Reasonable technical competence demonstrated. Able to reflect satisfactorily on the project. **Band: 40-49** **Pass level.** Competent background reading and appreciation of the project area. Basic technological competence. Some core areas are met, but a decent attempt has been made at them, albeit with significant weaknesses. Able to reflect in a limited way on the project. **Band: 30-39** Unsatisfactory. Some attempt has been made at the background reading but clearly, only a partial understanding of the project topic. An incomplete attempt at the core tasks. Weak technical competence. Little ability to reflect adequately on the project. **Band: 20-29** Inadequate background reading but shows some limited understanding of how ideas can be linked to the task. A minimal attempt at the core tasks, showing poor understanding. A substantial amount of work is still needed to achieve the core tasks. Minimal reflection on the project. **Band: 10-19** A minimal attempt at background reading, inappropriate use of material, and almost no attempt at core tasks. Very poor understanding of the problem. Minimal or no reflection on the project. **Band: 0-9** No or almost no significant attempt

Remarks	There are no restrictions for using publicly available code and/or formulations (subject to correct referencing); however, grading is still subject to your own contributions. Nevertheless, this should not discourage you from utilizing the advanced techniques from the literature as long as you can demonstrate a sufficient understanding of the relevant scientific literature. If in doubt, talk to the module convenor. If you struggle with the implementation, you may still achieve a reasonable mark for the report explaining your solution method.
Academic misconduct	This is an individual assessment that should consist of your own unaided work. While it is good practice to use your own word when explaining something from a primary source, if you are unable to paraphrase the statement, then you should quote the statements and cite the source accordingly. If you are building on someone else's code (e.g. our code from the classes, open-source projects, etc.), please make it clear which aspects of the code are your work through the use of comments. The University has detailed advice about academic integrity, and submissions that demonstrate a lack of that integrity will be treated under appropriate disciplinary procedures. The academic misconduct policy document can be accessed via: https://www.nottingham.ac.uk/qualitymanual/assessment-awards-and-deg-classification/pol-academic-misconduct.aspx