

Faculty of Technology – Course work Specification 2015/16

Module name:	Mechanics and Artificial Intelligence for Simulation		
Module code:	IMAT2800		
Title of the Assignment:	Tankwar		
This coursework item is: (delete as appropriate)	Summative		
This summative coursework will be marked anonymously	No		
The learning outcomes that are assessed by this coursework are:			
<ol style="list-style-type: none"> 1. Know the principal areas of Artificial Intelligence and how they are related 2. Be able to implement a simple AI software system and demonstrate it successfully. 			
This coursework is: (delete as appropriate)		Group	
This coursework constitutes 50% to the overall module mark.			
Date Set:	February 5th 2016		
Date & Time Due:	Tuesday the 19th of April at 4pm		
The 'normal' coursework return date for this work is:	May 23rd		
When completed you are required to submit your coursework to:			
<ol style="list-style-type: none"> 1. FOTAC, printed report plus CD, DVD or USB memory stick 			
Late submission of coursework policy: Late submissions will be processed in accordance with current University regulations which state: <i>"the time period during which a student may submit a piece of work late without authorisation and have the work capped at 40% if passed is 14 calendar days. Work submitted unauthorised more than 14 calendar days after the original submission date will receive a mark of 0%. These regulations apply to a student's first attempt at coursework. Work submitted late without authorisation which constitutes reassessment of a previously failed piece of coursework will always receive a mark of 0%."</i>			
Academic Offences and Bad Academic Practices: These include plagiarism, cheating, collusion, copying work and reuse of your own work, poor referencing or the passing off of somebody else's ideas as your own. If you are in any doubt about what constitutes an academic offence or bad academic practice you must check with your tutor. Further information is available at: http://www.dmu.ac.uk/dmu-students/the-student-gateway/academic-support-office/academic-offences.aspx and http://www.dmu.ac.uk/dmu-students/the-student-gateway/academic-support-office/bad-academic-practice.aspx			
Tasks to be undertaken: This is a group assignment. You will need to organise yourselves into groups of 4. All group members should be in the same lab group. You will receive an individual grade within the context of you group. Your grade will be broken down into the following components: <ul style="list-style-type: none"> • Project management 25% • Presentation skills 25% • Final product and report 50% For each component your group will be given an overall grade. This grade will be shared between individuals based on peer evaluation. For each component you will be required to allocate 100 points between your other team members based on the amount you believe they contributed to the submission, this will be done confidentially. These peer evaluation scores will then be used to allocate final marks to individuals unless the tutor has reason to believe peer evaluations have not been done confidentially or the process has not been wholly above board in any way. In this case the tutor will allocate individual marks.			

Example allocation

Group submission was graded at 67%

	John	Paul	George	Ringo	Aggregate Score	Scalar	Final Mark
John		35%	27%	30%	23%	0.92	62%
Paul	37%		43%	40%	30%	1.2	80%
George	38%	35%		30%	26%	1.03	69%
Ringo	25%	30%	30%		21%	0.85	57%
Sum	100%	100%	100%	100%	100%		

Instructions

Download the tankwar-CW.zip file from Blackboard and extract to the same folder where your lab work is saved. Open the tankwar.sln project in Visual Studio and compile.

Explanation of the Game

Tankwar is simple 2D strategic shooter game. The game has two tanks – red and blue. Each tank has a fixed number shells which it can fire, there are no opportunities to restock ammunition. Fired shells will only hit objects which are in the tanks field of vision at the time the shell is fired. Each tanks scores points by shooting the other tank (25 points) or shooting one of the opposition's buildings (10 points). At the end of the game the tank with the highest points wins. The game ends when both tanks have run out of ammunition or when either players buildings have been entirely destroyed.

Your Task

Your task for this coursework is to implement a controller (bot) for the AI Tank. The bot may make use of any AI technique you wish. Your group will need to carefully design the A.I. so that the bot exhibits the desired behaviours. Your AI Tank should be written as a class which inherits from AITank. The class DumbTank has been included to give you an example of how you should make use of the existing functionality. You may add additional classes related to this class but you may not alter any of the existing functionality in any way.

Working in a group is challenging, it will require you to deploy a range of transferable skills if your group is to be successful. You will be graded on your project management and presentation skills in addition to your technical abilities. These skills will be invaluable to your future career.

Assessment of Transferable Skills

Project Management

Your group should adopt a recognised software development methodology to help manage the resource you have to achieve the functionality you specify. You will be assessed on both planning and the implementation of that plan.

Presentations

Your group will be required to give a presentation to the rest of the class during the allocated lecture, on the design and implementation of your final product. This presentation will be assessed and this score will be your grade for the presentation component of the mark.

Teamwork

Your ability to work within a team is critical to the success of all aspects of this coursework. As an individual you need to be able to provide technical contributions, negotiate, compromise and be willing to accept contributions and constructive criticism from your peers. It is your responsibility to contribute to your group and it is the responsibility of your peers to allow you to make that contribution.

Deliverables to be submitted for assessment:

- A report detailing and explaining the design decisions of your software, level of functionality achieved and the testing regime used.
- A visual studio project containing the game.

How the work will be marked:

The mark will be assessed using a clear mark scheme appended to this document.

Module leader/tutor name:	Stephen Ackland
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Marking Scheme

Mark %	Project Management	Presentation Skills	Final Product and Report
0-29	Little thought given to project plan.	Amateurish presentation lacking basic information.	Design lacks any substance. No recognisable A.I. methodology attempted. A sparse poorly written report which lacks substance.
30-39	No clarity in individual roles. Plan does not reflect project scope.	Poor presentation which lacked clarity and confidence.	Design lacks thought and has serious flaws and/or omissions. Some attempt at implementing a sensible A.I. technique. Errors in design and implementation mean that bot does not exhibit the desired behaviour. A poorly written report which only covers the most trivial aspects of the A.I. design.
40-49	No clarity in individual roles. Plan contains the minimum amount of information required for the project to go ahead.	Presentation communicated basic information but lacked confidence in delivery.	Design covers key functionality but contains flaws and/or omissions. An attempt at implementing a sensible A.I. technique. Bot generally exhibits desired behaviour with some significant flaws. Report written and presented to an acceptable standard. Little detail about the design, implementation and testing are given.
50-59	Roles within the team have been thought about. Plan contains core information required for the project to be successful.	Presentation provided clear information with each team member providing a contribution.	Well thought through design with some problems. An attempt at implementing a sensible A.I. technique. Bot generally exhibits desired behaviour with some minor flaws. A decently presented report written to an acceptable standard. Some details about the design and implementation are given.
60-69	Roles clearly allocated and well thought out division of work. Good plan containing milestones and deliverables.	Engaging presentation with good contributions from each team member.	Well thought through and articulated design. Reference made to tank sensing functionality. A sensible A.I. technique has been well implemented and thoroughly tested resulting in a Bot which exhibits the desired behaviour and performs well. A well written and presented report. Design, implementation and testing decisions are justified.
70-100	Roles clearly allocated and well thought out division of work. Good plan containing milestones and	Excellent, highly professional presentation with strong contributions from each team member.	Well thought through design which is very well presented. Design is full related to tank sensing capability and problem explored. The A.I. technique has been selected from a range of options which have been explored. The final implementation is of a high standard. Very well presented document in all aspects.

	deliverables which have been measured throughout.		All decisions are justified and testing results are well presented.
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