



LIT

DEPARTMENT OF
INFORMATION TECHNOLOGY

Semester: Semester 2 (Summer 2014-2015)

Date/Time: Thursday 14th May 2015, 9:30 AM – 11:30 AM

Programme: Bachelor of Science (Honours) in Computing (Games Design and Development)

Stage: 4

Module: DIGITAL GAMES ARTIFICIAL INTELLIGENCE

COMP 8007

Time Allowed: 2 hours

Instructions: Attempt any four (4) questions

Additional Attachments: None

External Examiners: Derek O'Reilly

Internal Examiners: Janice O'Connell, Eugene Kenny

Question No. 1 (25 Marks)

- (a) Outline with aid of a diagram the basic structure of a games artificial intelligence engine. (8 marks)
- (b) In World Interfacing, a *Region Sense Manager* can be used to manage sense signals and sensors. Outline the functioning of the *Region Sense Manager*. (7 marks)
- (c) A *Region Sense Manager* can lead to non-realistic effects in games. (10 marks)

Give examples of these non-realistic effects and outline an alternative method for managing sense signals and sensors.

Question No. 2 (25 Marks)

- (a) How can movement behaviours be used in *Obstacle Avoidance*? (10 marks)
- (b) Complex movement behaviours can be constructed by combining more basic behaviours. Outline two approaches for doing this. (15 marks)

Question No. 3 (25 Marks)

In *Pathfinding*, planning a path is often reduced to a graph search problem by:

1. Constructing a graph representing the planning problem
2. Searching the graph for a (hopefully, close-to-optimal) path

Give details of four approaches of how a graph can be constructed by *Skeletonisation* of the configuration space. What are the advantages and disadvantages of each approach?

Question No. 4 (25 Marks)

- (a) Describe how *Goal-Oriented Planning* is implemented to bring seemingly intelligent behaviours to computer games. (12 marks)
- (b) Basic goal-oriented schemes can yield predictable results. How can uncertainty factors be implemented? (13 marks)

Question No. 5 (25 Marks)

- (a) What are the purposes and benefits of learning in computer games? What types of learning can be applied? (13 marks)
- (b) *Action Prediction* attempts to predict the future actions of a player based on past actions. Outline two methods for achieving this. (12 marks)