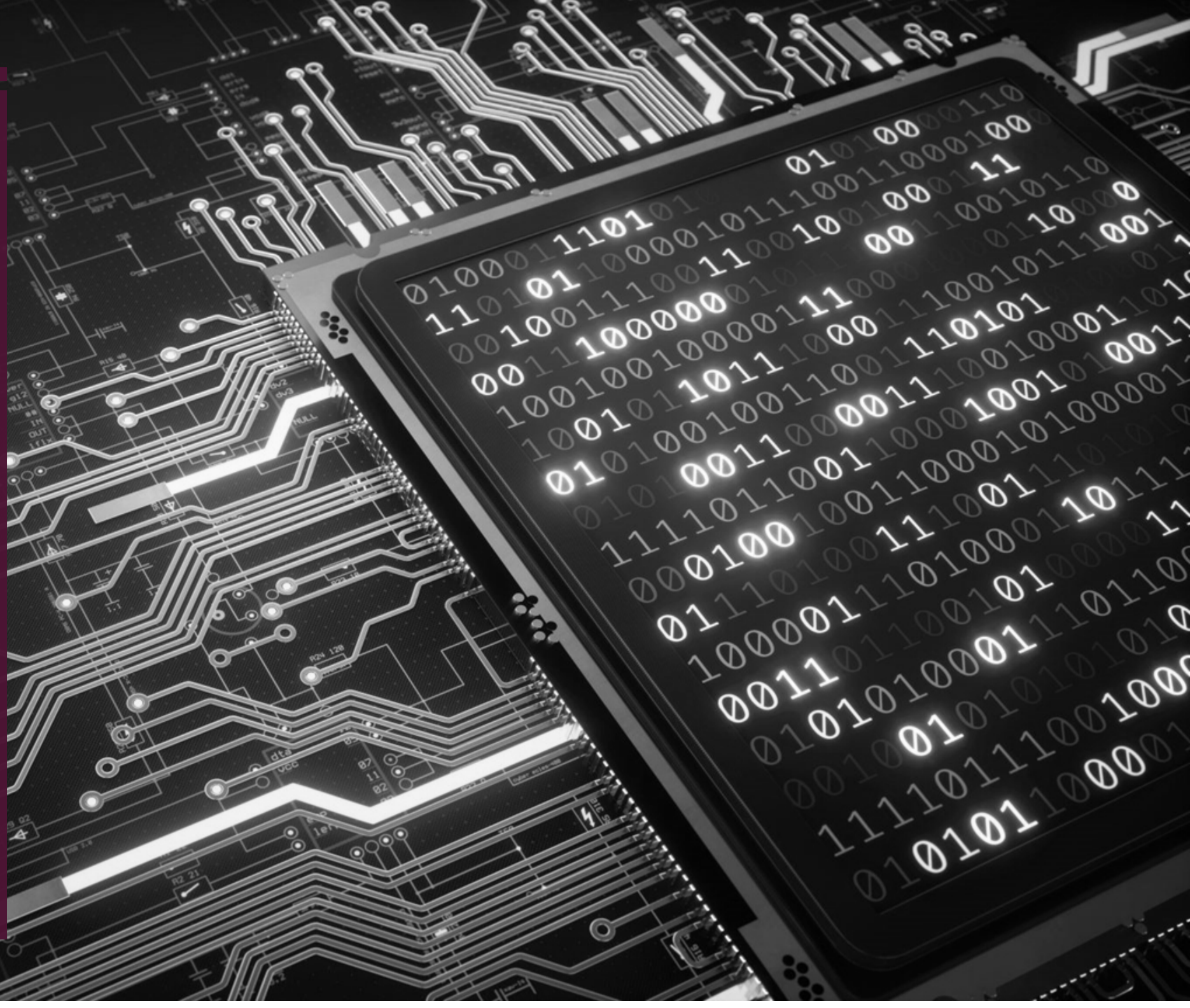
# COMP702

# CLASSICAL ARTIFICIAL INTELLIGENCE

# MODULE INDUCTION



# MODULE AIM

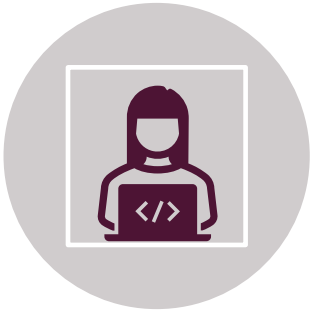
To confidently implement artificial intelligence techniques which are commonly used to solve problems in industry.

# SUMMARY MODULE DESCRIPTION

This module introduces you to the core techniques of artificial intelligence (AI): computational techniques for tackling problems that normally require human intelligence. You will refine your understanding of these techniques by applying them to well-defined problem domains, laying the foundation for more complex applications in subsequent modules. A deep knowledge of the past and present of AI will equip you for future developments in this fast-moving field.

This module covers "classical" AI focusing upon techniques that are commonly applied to decision-making and content generation in games and beyond. Applications of such techniques include the authoring of non-player character behaviours in games, the navigation of complex environments, the formation of logistical plans with respect to constraints, and the generation of content in creative domains. You will build a portfolio of AI instances applied to simplified versions of these and other domains. Thus you will study the strengths and weaknesses of standard AI techniques, gaining the ability to select appropriate technologies to solve real problems and to contextualise recent advances in the field.

# LEARNING OUTCOMES



**Code**: Implement working and maintainable software components

**Solve**: Demonstrate computational thinking and numeracy skills

# ASSESSMENT

Assignment 1:

**Portfolio of AI Instances** (100%)

Assignment brief on **LearningSpace**

Deadline on **MyFalmouth**

**Design** and **implement** a portfolio of **two** AI instances

**Instance 1:** Authored Behaviour (33%)

**Instance 2:** Computational Intelligence (67%)

# AI INSTANCES – EXAMPLES / IDEAS

NPC behaviour

Strategic AI

Procedural content generator

Director system

Game design tool

Puzzle solver

Component for existing project

Board game AI

Standalone game / demo

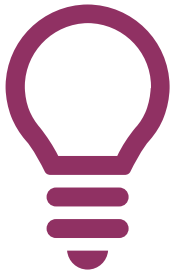
Unity asset

# ASSESSMENT CRITERIA

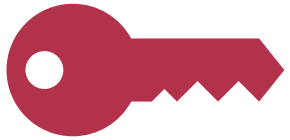
| 20% Choice of Concepts | 40% Sophistication | 20% Functional Coherence | 20% Maintainability |
|---|---|---|---|
| • Appropriateness to demonstrate AI techniques<br>• Scope<br>• Creativity | • Insight into AI techniques<br>• Insight into software architecture | • Requirements are met<br>• No bugs detected | • Code quality<br>• Tweakability<br>• Documentation |

# INSTANCE 1 PROPOSAL

For **this Friday's workshop**, prepare a **draft proposal** for your first AI instance (authored behaviour)



Outline the **concept**



Describe the **key requirements**

Identify the **AI technique(s)** you will implement (or if you don't know yet, explain how you'll find out)

# PRELIMINARY TOPIC SCHEDULE

- **Week 7**
  - Module Induction
  - What Is AI?
- **Week 8**
  - Authored Behaviour
  - Emergence
- **Week 9**
  - Theoretical Models
  - Monte Carlo Tree Search
- **Week 10**
  - Navigation
  - Planning
- **Week 11**
  - Constraint Programming
  - Logic Programming
- **Week 12**
  - Fuzzy Logic

# TIMETABLE OVERVIEW

| Week 7 | Week 8 | Week 9 | Week 10 | Week 11 | Week 12 |
|---|---|---|---|---|---|
| Induction (1 hr) | Journal Club (2 hr) | Journal Club (2 hr) | Journal Club (2 hr) | Journal Club (2 hr) | Journal Club (2 hr) |
| Workshop (2 hr) | Workshop (2 hr) | Workshop (2 hr) | Workshop (2 hr) | Workshop (2 hr) | Workshop (2 hr) |
| | Workshop (2 hr) | Workshop (2 hr) | Workshop (2 hr) | Workshop (2 hr) | |

Holiday

| Week 13 | Week 14 | Week 15 |
|---|---|---|
| Peer Review (1 hr) | Assessment & feedback vivas (1 hr) | |
| Assessment Deadline (check MyFalmouth!) | | |

Refer to MyTimetable for up-to-date timetable details

# JOURNAL CLUB SEMINARS

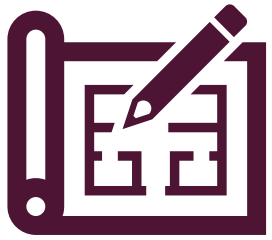
**Read** a paper, which will be linked on LearningSpace the previous week

Come to the seminar ready to **discuss** the paper: bring your comments, questions, thoughts

Not assessed, but an important opportunity to reflect on state-of-the-art AI research and possibly apply it to your own practice

For **next Monday**: Grow et al. "A Methodology for Requirements Analysis of AI Architecture Authoring Tools"

# SUMMARY OF WHAT'S NEXT



**For this Friday**

Start drafting your proposal for AI Instance 1

**For next Monday**

Read the first paper for Journal Club

**For now**

Any questions?