Classical Artificial Intelligence

COMP712

Week 1 - Induction

Dr Daniel Zhang (Senior Lecturer in AI)

Falmouth University, v. 2023 - 2024

FALMOUTH UNIVERSITY

Digital Attendance System (SEATS)

Be aware of the system and check your attendance regularly. Manually register if it did' t work.

Module Outline

Aim

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

Description

- introduce you to the core techniques of AI
- refine your understanding of these techniques
- study the strengths and weaknesses of standard AI techniques
- equip you with a solid background in this fast-moving field
- train you to apply them to well-defined problem domains
- lay the foundation for more complex applications in subsequent module
- select appropriate technologies to build a portfolio of AI instances

Description Summary

learn classical AI techniques

will look at machine learning in next SB

make a 'portfolio' using AI techniques

Learning Outcomes

Code/Compute

implement working and maintainable software components

Solve

Demonstrate computational thinking and numeracy skills (Not directly assessed)

Teaching

Module Delivery

- Given by: Dr Daniel Zhang
- Email: Daniel.Zhang@falmouth.ac.uk (also on MS Teams)
- Drop me an email to arrange meetings if necessary.

Who am I?

- **Name:** Dr Daniel Zhang
- **Role:** Senior Lecturer in Artificial Intelligence
- **Background:**
  - worked for Rolls-Royce UTC at University of Southampton (aircraft engine design & optimisation)
  - focused on AI/ML and their Applications
  - delivered more than 10 successful software and production tools to Rolls-Royce to solve their computational engineering problems
  - supported Rolls-Royce engineers in five R&D Centres: Bristol (UK), Derby (UK), Dahlewitz (Germany), Illinois (US), Bangalore (India)

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- **Name:** Dr Daniel Zhang
- **Role:** Senior Lecturer in Artificial Intelligence
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- Rolls-Royce XWB

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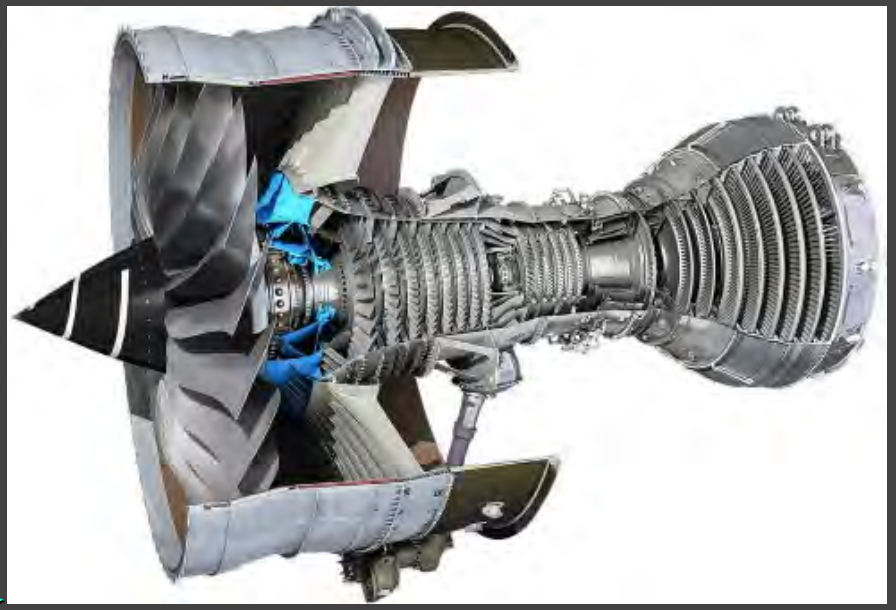
-  - Rolls-Royce XWB

Who am I? (cont.)

- **Name:** Dr Daniel Zhang
- **Role:** Senior Lecturer in Artificial Intelligence
- **Teaching:** MSc courses in Games Academy
  - Classical Artificial Intelligence
  - Machine Learning
- **Other activities**: dissertation, group project, PhD supervision, research, etc.

Email Policy

Daniel.Zhang@falmouth.ac.uk

- Short and to-the-point email will be read. (or MS Teams).
- Talk to me before or after class during my office hours.
- An alternative mutually acceptable meeting time may need to be agreed upon if there's an unavoidable scheduling conflict.

Assessment

Assignment

- **Format**: portfolio of AI instances with computational efforts
- **Marks**: 100%
- **Details**: see Learning Space

Important Notes

Deadline: check MyFalmouth and/or MyTimetable for deadlines

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-> Please note: late submission WILL be penalised!
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You marks would be capped for anything past the due date, unless you have an approved Extenuating Circumstances (EC) Applications (you must submit your EC application via MyFalmouth portal)

Examples/Ideas

- NPC Behaviour
- Strategic AI
- Procedure Content Generator
- Game Design Tool
- Puzzle Solver
- Component for Existing Project*
- Board Game AI
- Standalone Game/Demo

*Draw a clear line between the project and the component!

NO duplicate submissions!

Marking Criteria

Choice of Concept: 20%

-Appropriate
-Scope
-Creative

Functional Coherence: 20%

-Requirements are met
-No (obvious) bug detected

Sophistication: 40%

-Insight into AI techniques
-Insight into software architecture

Maintainability: 20%

-Code quality
-Flexibility
-Documentation

Step 1: Proposal (Part A)

For your first AI technique:

- **Outline** concept
- **Describe** key requirements
- **Identify** AI techniques that will be implemented

Step 2: Implement (Part B)

Implement your AI technique

- **Write** your code
- **Pay attention** to the marking rubic

Step 3: Repeat (Part C & D)

Repeat step 1 and 2 for the second instance

- **Repeat** the previous two steps
- **Check** the requirements for the second instance

Step 4: Refine (Part E)

- **Implement** final version of your AI
- **Submit** on learning space
  - Deadline on **MyFalmouth**
  - Do not miss the deadline or be penalised

Step 5: Viva (Part F)

- Attend the viva, demonstrate your work
  - Currently scheduled with me and other lecturers
  - Week 15(ish), the end of SB1
  - Check timetable for session!

Version Control

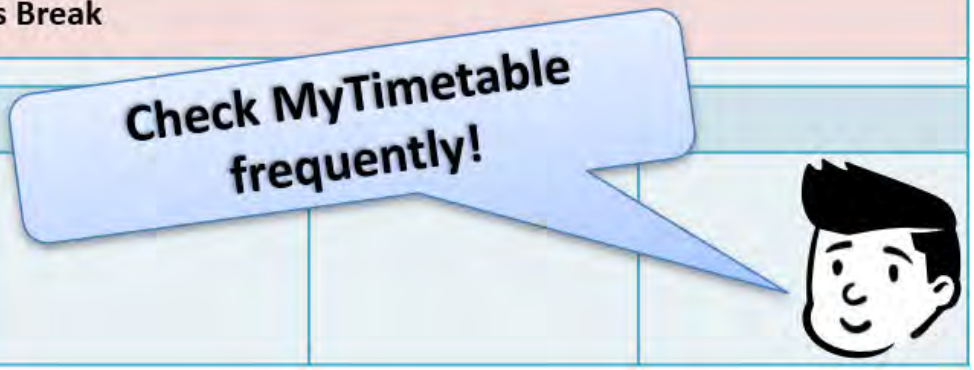
Manage your work using version control tools.

You are going to submit a repository.

Timetable

Timetable (Study Block 1)

Study Block 1					
Week1	**Week2**	**Week3**	**Week4**	**Week5**	**Week6**
Week7	**Week8**	**Week9**	**Week10**	**Week11**	**Week12**
	Induction (1 hr)	Lecture (1 hr)	Lecture (1 hr)	Lecture (1 hr)	Lecture (1 hr)
		Workshop (2 hr)	Workshop (2 hr)	Workshop (2 hr)	Workshop (2 hr)
		Seminar (1 hr)	Seminar (1 hr)	Seminar (1 hr)	Seminar (1 hr)
Christmas Break					
Week13	**Week14**	**Week15**			
Lecture (1 hr)	Drop-in (1 hr)	**Assessment** (1 hr)			
Workshop (2 hr)	Peer review (1 hr)				
Seminar (1 hr)					



Week 8 to week 15 (DO check MyTimetable)

Session Structure

- Lectures (1 hour)
- Weekly workshops (2 hours)
- Seminar/paper club (1 hour)

Check MyTimetable for details!

Paper Club (Seminar)

-  Read a paper together with your peers
-  Come to the seminar ready to discuss the paper: bring questions, comments, thoughts, ...
-  Not assessed, but an important opportunity to reflect on state-of-the-art AI research, and possibly apply it to your own practice

Prerequisites

- Some knowledge of maths and probability
- Some programming skills would be useful but not essential (C++, Python, Matlab, Java, etc.)


No Panic!

Questions?

Email: Daniel.Zhang@falmouth.ac.uk

Games Academy, Penryn Campus, Falmouth University