COMP8410

Advanced Topics in Artificial Intelligence

Session 2, In person-scheduled-weekday, North Ryde 2023

School of Computing

Contents

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General Information

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Credit points
10

Prerequisites
COMP6400

Corequisites

Co-badged status

Unit description
The fast moving field of Artificial Intelligence (AI) continues to push the frontiers what machines can achieve. This unit surveys emerging topics and trends in AI. These topics drawn from the latest research literature vary from offering to offering, their selection being inspired by cutting-edge development in the field. These topics include but are not limited to: decision making under uncertainty, reasoning, planning, machine learning, natural language understanding and the legal and ethical implications of AI-driven technologies. The unit consists of lectures, reading, and assessed components of scientific writing in various forms.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at https://www.mq.edu.au/study/calendar-of-dates

Learning Outcomes

On successful completion of this unit, you will be able to:

ULO1: Demonstrate an understanding of emerging concepts, techniques, and algorithms in AI.

ULO2: Critically navigate and examine the scientific literature within the field of AI.

ULO3: Identify strengths and limitations of recent AI-driven technologies and judge their readiness for industry.

ULO4: Explain the legal and ethical implications that AI has on organizations and on the future of work

ULO5: Communicate and present scientific research clearly and effectively to others.

General Assessment Information

Requirement to Pass this Unit

To pass this unit, you must achieve a total mark equal to or greater than 50%. Note that we offer 12 portfolio tasks during the semester but only count the 10 best submissions, each worth 4 marks.

Late Assessment Submission Penalty

Unless a Special Consideration request has been submitted and approved, a 5% penalty (of the total possible mark of the task) will be applied for each day a written report or presentation assessment is not submitted, up until the 7th day (including weekends). After the 7th day, a grade of '0' will be awarded even if the assessment is submitted. The submission time for all uploaded assessments is **11:55 pm**. A 1-hour grace period will be provided to students who experience a technical concern.

For any late submission of time-sensitive tasks, such as scheduled tests/exams, performance assessments/presentations, and/or scheduled practical assessments/labs, please apply for Special Consideration.

Assignments where Late Submissions will be accepted/not accepted:

- Assignment #1 (12 Portfolio Tasks): **No,** unless Special Consideration is granted.
- Assignment #2: **Yes**, Standard Late Penalty applies.
- Assignment #3: **Yes**, Standard Late Penalty applies.

Special Consideration

The Special Consideration Policy aims to support students who have been impacted by short-term circumstances or events that are serious, unavoidable and significantly disruptive, and which may affect their performance in assessment. If you experience circumstances or events that affect your ability to complete the assessments in this unit on time, please inform the convenor and submit a Special Consideration request through ask.mq.edu.au.

Assessment Tasks

Name	Weighting	Hurdle	Due
Assignment 1	40%	No	Each Tuesday, Week 2-13
Assignment 2	30%	No	Week 7
Assignment 3	30%	No	Week 12

Assignment 1

Assessment Type [1]: Portfolio
Indicative Time on Task [2]: 40 hours
Due: **Each Tuesday, Week 2-13**
Weighting: **40%**

A collection of evidence of skills development in form of reports and short videos.

On successful completion you will be able to:

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- Communicate and present scientific research clearly and effectively to others.

Assignment 2

Assessment Type [1]: Literature review
Indicative Time on Task [2]: 30 hours
Due: **Week 7**
Weighting: **30%**

Review of the literature relevant to one or more of the topics presented in the unit.

On successful completion you will be able to:

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- Critically navigate and examine the scientific literature within the field of AI.
- Communicate and present scientific research clearly and effectively to others.

Assignment 3

Assessment Type [1]: Case study/analysis
Indicative Time on Task [2]: 30 hours
Due: **Week 12**
Weighting: **30%**

Students will conduct a case study of an AI application in an industry context; investigate a scenario, determine what problems exist, and develop the best possible strategy to achieve the desired outcome.

On successful completion you will be able to:

- Demonstrate an understanding of emerging concepts, techniques, and algorithms in AI.
- Identify strengths and limitations of recent AI-driven technologies and judge their readiness for industry.
- Communicate and present scientific research clearly and effectively to others.

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[1] If you need help with your assignment, please contact:

- the academic teaching staff in your unit for guidance in understanding or completing this type of assessment
- the Writing Centre for academic skills support.

[2] Indicative time-on-task is an estimate of the time required for completion of the assessment task and is subject to individual variation

Delivery and Resources

Classes

Each week has two hours of lectures. For details of days, times and rooms consult the timetables webpage. There is no workshop/practical class for this unit.

Required and Recommended Texts

All required and recommended readings will be provided as part of the lecture material.

Unit Web Page

The unit web page will be hosted in iLearn. You will need to log in to iLearn using your Student One ID and password. The unit will make extensive use of discussion boards also hosted in iLearn. Please post questions there, they will be monitored by the staff on the unit.

Methods of Communication

We will communicate with you via your university email or through announcements in iLearn. Questions to convenors can either be placed on the iLearn discussion board or sent to the unit convenor from your university email address.

COVID Information

For the latest information on the University's response to COVID-19, please refer to the Coronavirus infection page on the Macquarie website: https://www.mq.edu.au/about/coronavirus-faqs. Remember to check this page regularly in case the information and requirements change during the semester. If there are any changes to this unit in relation to COVID, these will be communicated via iLearn.

Unit Schedule

Week	Topic	Reading
1	+ Towards Statistical Relational Artificial Intelligence + Imperative versus Declarative Programming	Lecturer Supplied
2	+ Answer Set Programming + Optimisation in Answer Set Programming	Lecturer Supplied
3	+ Commensense Knowledge and Reasoning + Diagnosis and Explanations	Lecturer Supplied
4	+ Probabilistic Logic Programs (PLPs) + Inference Tasks for PLPs	Lecturer Supplied
5	+ Parameter Learning of PLPs + Structure Learning of PLPs	Lecturer Supplied
6	+ PLPs for Natural Language Understanding + Neural Probabilistic Logic Programming	Lecturer Supplied
7	+ Complex Data Structures and their Real World Application Environments + Averaged One Dependence Estimators	Lecturer Supplied

8	+ Hidden Naive Bayes - Theories + Hidden Naive Bayes - Performance Analysis	Lecturer Supplied
9	+ Weak Machine Learning + Multi-instance Learning	Lecturer Supplied
10	+ Data Mapping + Positive and Unlabelled Learning	Lecturer Supplied
11	+ Multi-view Learning + Cross-view Feature Selection	Lecturer Supplied
12	+ Guest Lecture (TBD) + Guest Lecture - continued (TBD)	
13	+ Review: First Half of the Unit + Review: Second Half of the Unit	

Policies and Procedures

Macquarie University policies and procedures are accessible from Policy Central (https://policies.mq.edu.au). Students should be aware of the following policies in particular with regard to Learning and Teaching:

- Academic Appeals Policy
- Academic Integrity Policy
- Academic Progression Policy
- Assessment Policy
- Fitness to Practice Procedure
- Assessment Procedure
- Complaints Resolution Procedure for Students and Members of the Public
- Special Consideration Policy

Students seeking more policy resources can visit Student Policies (https://students.mq.edu.au/support/study/policies). It is your one-stop-shop for the key policies you need to know about throughout your undergraduate student journey.

To find other policies relating to Teaching and Learning, visit Policy Central (https://policies.mq.edu.au) and use the search tool.

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of

Conduct: https://students.mq.edu.au/admin/other-resources/student-conduct

Results

Results published on platform other than eStudent, (eg. iLearn, Coursera etc.) or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in eStudent. For more information visit ask.mq.edu.au or if you are a Global MBA student contact globalmba.support@mq.edu.au

Academic Integrity

At Macquarie, we believe academic integrity – honesty, respect, trust, responsibility, fairness and courage – is at the core of learning, teaching and research. We recognise that meeting the expectations required to complete your assessments can be challenging. So, we offer you a range of resources and services to help you reach your potential, including free online writing an d maths support, academic skills development and wellbeing consultations.

Student Support

Macquarie University provides a range of support services for students. For details, visit http://stu dents.mq.edu.au/support/

The Writing Centre

The Writing Centre provides resources to develop your English language proficiency, academic writing, and communication skills.

- Workshops
- Chat with a WriteWISE peer writing leader
- Access StudyWISE
- Upload an assignment to Studiosity
- Complete the Academic Integrity Module

The Library provides online and face to face support to help you find and use relevant information resources.

- Subject and Research Guides
- Ask a Librarian

Student Services and Support

Macquarie University offers a range of Student Support Services including:

- IT Support
- Accessibility and disability support with study
- Mental health support
- Safety support to respond to bullying, harassment, sexual harassment and sexual

assault

- Social support including information about finances, tenancy and legal issues
- Student Advocacy provides independent advice on MQ policies, procedures, and processes

Student Enquiries

Got a question? Ask us via AskMQ, or contact Service Connect.

IT Help

For help with University computer systems and technology, visit http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/.

When using the University's IT, you must adhere to the Acceptable Use of IT Resources Policy. The policy applies to all who connect to the MQ network including students.

Changes since First Published

Date	Description
07/07/2023	I forgot to add Jia Wu as a lecturer. -- Rolf