CITS5508 Machine Learning
Overview and Administration

Débora Corrêa (Unit Coordinator and Lecturer)

2023

Unit Description

Extracting meaningful knowledge from large amounts of data has become a priority for businesses as well as scientific domains.

Machine learning provides techniques to data analytics, where algorithms iteratively learn from data to uncover hidden insights.

In this unit, students will develop understanding of machine learning techniques that are applicable to both scientific and business data. The topics covered by the unit include supervised classification and unsupervised classification.

Learning Outcomes

On completion of this unit, students will be able to:

- understand the role of machine learning in knowledge extraction
- understand the difference between supervised and unsupervised learning algorithms
- display a systematic knowledge of algorithmic machine learning approaches
- produce practical implementations of machine learning solution for a real-world dataset (programming exercises)
- develop the ability to analyse data datasets from the perspective of machine learning

LMS page

Answers to everything. :)

People

Unit Coordinator and Lecturer: Dr Débora Corrêa
Consultation: Thursdays 9am – 11am in CSSE Room 1.14

Unit email: cits5508-pmc@uwa.edu.au

Facilitators:
Braden Thorne
Talin Taparia
Nathaniel Barry

Places

Students should attend the two-hour lecture each week.

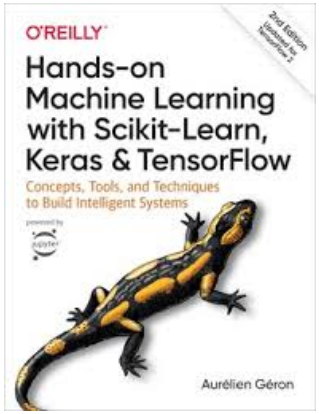
Lab work is assessed and you have a supervised lab allocated each week. Students are encouraged to attend the lab class for completing the programming exercises. You can use your own laptop to catch up with them at your own time.

Type	**Time**	**Day**	**Location**
Lecture	11am-1pm	Tuesday	ENCM:G04 (Eng. LT2)
Lab	11am-1pm	Thursday	ELEC:151
Lab	3pm-5pm	Thursday	ENCM:207A and 207B

You may attend one or both lab sessions.

Text Book and Resources

Aurélien Géron, *Hands-on Machine Learning with Scikit-Learn & TensorFlow*, O'Reilly, 2nd edition, 2019



Find links via: O'Reilly, Amazon, UWA Library

Schedule and Topics

Week	Lectures
1	Introduction to Machine Learning
2	Overview of a Machine Learning project
3	Supervised Learning Techniques: K-nearest neighbors (KNN)
4	Supervised Learning Techniques: Regression Models
5	Supervised Learning Techniques: Support Vector Machines
6	Supervised Learning Techniques: Decision Trees
Non-teaching week	
7	Mid-semester test
	Supervised Learning Techniques: Ensemble Learning and Random Forests
8	ANZAC Day on Tuesday (no lecture this week)
9	Dimensionality Reduction
10	Unsupervised Learning Techniques: K-means
11	Unsupervised Learning Techniques: Hierarchical Clustering
12	Topics in Machine Learning

Python

Programming and examples for this unit will be undertaken in Python. It is recommended to use the latest 3.X version, e.g., 3.8.5 or above, and definitely not 2.X.

We will use standard scientific libraries such as NumPy, Pandas and MatPlotLib; and Jupyter Notebook or Jupyter Lab.

We will learn to make use of packages such as *Scikit-Learn*.

Coursework

Your work in this course will include:

- Reading from the textbook
- Taking part in lectures
- Lab exercises
- A mid-semester test
- A final exam

Assessment

Type	**Percent**	**Date**
Assignments	35%	various times
Mid-semester test	15%	week 7
Exam	50%	June exam period

Assignments include 3 assessed lab exercises. Assignment one weights 10%, assignment two weights 10%, and assignment three weights 15%. Please refer to the Unit Calendar for deadlines and Unit Details for Special Consideration Rules.

The mid-semester test is a 1-hour test in class. It will cover unit content from weeks 1 to 6.

The *Exam* is a 2-hour exam. More details about this in week 12.

Plagiarism

Do not submit the work of other people.

Penalties are severe.

If you are unsure of a particular situation, please check `https://www.uwa.edu.au/students/Getting-started/Student-conduct`.