MONASH University

Handbook

Unit

FIT3181 Deep Learning

Overview

Deep learning (DL) has been fuelling Artificial Intelligence (AI) and the Fourth Industrial Revolution in recent years. The success of DL in many applications, including generative AI such as ChatGPT or DALL·E, has gained rocketed attention and becomes a highly demanded skill across industries and sectors. It is transforming innovations, powering new applications and impact our society in everyday activities. In this unit, the students will learn the foundations of deep learning theory within a broader context of machine learning. At the same time, they will gain hands-on practical skills on how to apply DL to real-world applications across a range of AI cognitive tasks in computer vision such as image and object recognition, in natural language processing such as text classification using deep neural embeddings. Learning activities will focus on understand the fundamental concepts in DL such as neural networks (NN), convolutional NN, backpropagation and optimisation for deep learning, adversarial robustness, attention mechanism, transformer, important concepts in deep generative AI (VAE, GAN), in combination with laboratory sessions to gain hands-on experiences.

Faculty:
Faculty of Information Technology

Owning organisational unit:
Faculty of Information Technology

Study level:
Undergraduate

SCA band:
2

EFTSL:

Credit points:

0.125 6

Open to exchange or study abroad students?
Yes

Offerings

S2-01-CLAYTON-ON-CAMPUS

Location: Clayton

Teaching period: Second semester

Attendance mode: On-campus

S2-01-MALAYSIA-ON-CAMPUS

Location: Malaysia

Teaching period: Second semester

Attendance mode: On-campus

Requisites

Prerequisite

→ FIT2086 6 CP

Modelling for data analysis

Contacts

Chief Exami

Professor Dinh Phu

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Offering(s):

- Applies to all offerings

Unit Coordinator(s)

Dr Lim Chern Hong

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Offering(s):

- Second semester, Malaysia, On-campus

Learning outcomes

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

1. Describe basic and advanced concepts of machine learning, AI, and deep learning
2. Assess what deep learning is, what makes deep learning work or fail, and critique where they should be applied.
3. Explain fundamental elements of deep learning.

4. Construct deep neural networks, convolutional NNs, RNN, deep generative models and apply different strategies for training them

5. Apply DL models in real-world applications such as image classification, text translation, image/text gener

6. Develop critical th nds-on experiences with practical deep learning models and fram

Teaching approach

Active learning

Assessment summary

This unit has threshold mark hurdles. You must attempt all assessments, achieve at least 40% in the midterm exam and an overall unit mark of 50% or more to pass the unit. If you do not achieve the threshold mark, you will receive a fail grade (NH) and a maximum mark of 45 for the unit.

Assessment

Assignment 1

Value %: 25

Quiz 1

Value %: 10

Assignment 2

Value %: 20

Quiz 2

Value %: 10

Mid term test

Value %: 35

Hurdle type: Threshold

Hurdle description:

This task is part of the in-semester assessment hurdle.

Scheduled teaching activities

Laboratories

Total hours: 24 hours

Offerings:

- Applies to all offerings

Seminars

Total hours: 24 hours

Offerings:

- Applies to all offerings

Workload requirements

Workload

Minimum total expecte the learning outcomes for this unit is 144 hours per semester typically com heduled online and face to face learning activities and independent study. Ind nclude associated reading and preparation for scheduled teaching act

Availability in areas of study

Data Science, Computer Science, Artificial Intelligence