School of
Engineering and Computer Science
Te Kura Mātai Pūkaha, Pūrorohiko

Prescription

This course addresses the fundamentals of neural network based deep learning. It covers the commonly used deep learning architectures such as fully connected networks, resnets, variational autoencoders, and generative adversarial networks. It discusses functional blocks such as convolutional nets, recurrent neural nets such as LSTMs, and the common objective functions and regularization procedures. Examples will discuss applications such as object classification, classification of sequential text, and the generation of realistic human faces.

Course learning objectives

Students who pass this course should be able to:

1. Explain advanced concepts of neural networks and deep learning.
2. Use and implement deep learning techniques to solve real-world problems such as classification and the generation of realistic images.
3. Read, interpret, and explain current papers on deep learning in the research literature.

Course content

The course is primarily offered in-person, but there will also be a remote option and there will be online alternatives for all the components of the course for students who cannot attend in-person.

Students taking this course remotely must have access to a computer with camera and microphone and a reliable high speed internet connection that will support real-time video plus audio connections and screen sharing. Students must be able to use Zoom; other communication applications may also be used. A mobile phone connection only is not considered sufficient. The computer must be adequate to support the programming required by the course: almost any modern windows, macintosh, or unix laptop or desktop computer will be sufficient, but an Android or IOS tablet will not.

If the assessment of the course includes tests, the tests will generally be run in-person on the Kelburn campus. There will be a remote option for students who cannot attend in-person and who have a strong justification (for example, being enrolled from overseas).
The remote test option will use Zoom for online supervision of the tests and you must be able to use Zoom with a camera, microphone, and screen-sharing. Students who will need to use the remote test option must contact the course coordinator in the first two weeks to get permission and make arrangements.
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Withdrawal from Course

Withdrawal dates and process:
https://www.wgtn.ac.nz/students/study/course-additions-withdrawals

Lecturers

Bastiaan Kleijn (Coordinator)

bastiaan.kleijn@vuw.ac.nz 04 4636613

417 Alan MacDiarmid Building, Kelburn

Teaching Format

This course will be offered in-person and online. For students in Wellington, there will be a combination of in-person components (lectures and office hours) and web/internet based resources. It will also be possible to take the course entirely online for those who cannot attend on campus, with lectures accessible by zoom and also recorded, and office-hours via email or zoom.

Student feedback

Student feedback on University courses may be found at:
www.cad.vuw.ac.nz/feedback/feedback_display.php

Dates (trimester, teaching & break dates)

- Teaching: 05 July 2021 - 08 October 2021
- Break: 16 August 2021 - 29 August 2021
- Study period: 11 October 2021 - 14 October 2021
- Exam period: 15 October 2021 - 06 November 2021

Class Times and Room Numbers

05 July 2021 - 15 August 2021

- **Monday** 09:00 - 09:50 – LT105, Alan MacDiarmid Building, Kelburn
- **Wednesday** 09:00 - 09:50 – LT105, Alan MacDiarmid Building, Kelburn

30 August 2021 - 10 October 2021

- **Monday** 09:00 - 09:50 – LT105, Alan MacDiarmid Building, Kelburn
- **Wednesday** 09:00 - 09:50 – LT105, Alan MacDiarmid Building, Kelburn

Set Texts and Recommended Readings

Required

There are no required texts for this offering.

Mandatory Course Requirements

There are no mandatory course requirements for this course.

If you believe that exceptional circumstances may prevent you from meeting the mandatory course requirements, contact the Course Coordinator for advice as soon as possible.

Assessment

This assessment scheme is the 2020 version. It is likely to change somewhat in 2021.

Assessment Item	Due Date or Test Date	CLO(s)	Percentage
Project 1 (20 Hours, code, output, plus structured report)	TBC	CLO: 1,2	15%
Project 2 (20 Hours, code, output, plus structured report)	TBC	CLO: 1,2	15%
6 assignments (3 Hours each)	TBC	CLO: 1,3	10%
Test (50 minutes duration)	TBC	CLO: 1,2	15%
Final examination (2 hours duration)	During examination period	CLO: 1,2,3	45%

Penalties

It is important to get the assignments in on time if possible, and so late hand-in will be penalized at 20% per day (unless a prior arrangement has been made with the lecturer).

Extensions

Individual extensions will only be granted where there are special personal circumstances, and should be negotiated with the course coordinator before the deadline whenever possible. Documentation (eg, medical certificate) may be required.

Submission & Return

All work should be submitted through the ECS submission system, accessible through the course web pages. Marks and comments will be returned through the ECS marking system, also available through the course web pages.

Workload

In order to maintain satisfactory progress in AIML 425, you should plan to spend an average of 10-11 hours per week on this paper. A plausible and approximate breakdown for these hours would be:

- Lectures: 2
- Readings and reviewing the lecture material: 4
- Assignments or project : 4

Teaching Plan

See https://ecs.wgtn.ac.nz/Courses/AIML425_2021T2/LectureSchedule

Communication of Additional Information

All online material for this course can be accessed at https://ecs.wgtn.ac.nz/Courses/AIML425_2021T2/

Links to General Course Information

- Academic Integrity and Plagiarism: https://www.wgtn.ac.nz/students/study/exams/integrity-plagiarism
- Academic Progress: https://www.wgtn.ac.nz/students/study/progress/academic-progess (including restrictions and non-engagement)
- Dates and deadlines: https://www.wgtn.ac.nz/students/study/dates
- Grades: https://www.wgtn.ac.nz/students/study/progress/grades
- Special passes: Refer to the Assessment Handbook, at https://www.wgtn.ac.nz/documents/policy/staff-policy/assessment-handbook.pdf
- Statutes and policies, e.g. Student Conduct Statute: https://www.wgtn.ac.nz/about/governance/strategy
- Student support: https://www.wgtn.ac.nz/students/support
- Students with disabilities: https://www.wgtn.ac.nz/st_services/disability/
- Student Charter: https://www.wgtn.ac.nz/learning-teaching/learning-partnerships/student-charter
- Terms and Conditions: https://www.wgtn.ac.nz/study/apply-enrol/terms-conditions/student-contract
- Turnitin: http://www.cad.vuw.ac.nz/wiki/index.php/Turnitin
- University structure: https://www.wgtn.ac.nz/about/governance/structure
- VUWSA: http://www.vuwsa.org.nz

Offering CRN: 33067

Points: 15
Prerequisites: AIML 420 or COMP 307
Restrictions: the pair (COMP 421, 422);
Duration: 05 July 2021 - 07 November 2021
Starts: Trimester 2
Campus: Kelburn