Introduction to Deep Learning (COMP0090)

Description

Aims:
To have a full understanding of the learning outcomes.

Learning outcomes:
On successful completion of the module, a student will be able to:
1. understand the fundamental principles, theory and approaches for learning with deep neural networks;
2. understand the main variants of deep learning (such as feedforward and recurrent architectures), and their typical applications;
3. understand the key concepts, issues and practices when training and modelling with deep architectures;
4. understand automatic differentiation theory and multivariate optimisation;
5. understand how deep learning fits within the context of other ML approaches and what learning tasks it is considered to be suited and not well suited to perform;

Content:
- This module will aim to teach students the fundamentals of modern neural networks. It will cover the most common forms of model architectures and primarily the algorithms used to train them. The theory and principles will be presented alongside example applications. The aim is to focus on the core algorithms, ideas and mathematics, rather than any specific implementation framework;
- Students will be taught the basics of neural networks, feedforward networks, recurrent networks; and introduced to concepts such as: regularisation, optimisation and hyper-parameter optimization;

Requisites:
In order to be eligible to select this module, a student must be registered on a programme for which it is a formally-approved option or elective choice AND must be (i) familiar with undergraduate mathematics, in particular multivariate calculus, linear algebra and probability (including the multivariate normal distribution and other

Key information

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<th>Year</th>
<th>2019/20</th>
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<tr>
<td>Credit value</td>
<td>15 (150 study hours)</td>
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<tr>
<td>Delivery</td>
<td>PGT L7, Campus-based</td>
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<td>Reading List</td>
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<tr>
<td>Tutor</td>
<td>Prof David Barber</td>
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<td>Term</td>
<td>Term 1</td>
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Assessment

Find out more

For more information about the department, programmes, relevant open days and to browse other modules, visit ucl.ac.uk
standard distributions); (ii) familiar with Machine Learning concepts and practice; and (iii) proficient in programming (examples and assignments may be given in a high level language such as Julia or Python).

Please note that this module is not suitable as an introduction to Machine Learning. It is suitable only for students that wish to gain an understanding of the mathematics of Deep Learning.
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**Assessment**

- Coursework: 30%
- Written examination (main exam period): 70%

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