

Summary Information

Module Code	7146COMP
Formal Module Title	Advanced Topics in Deep Learning
Owning School	Computer Science and Mathematics
Career	Postgraduate Taught
Credits	20
Academic level	FHEQ Level 7
Grading Schema	50

Module Contacts

Module Leader

Contact Name	Applies to all offerings	Offerings
Paul Fergus	Yes	N/A

Module Team Member

Contact Name	Applies to all offerings	Offerings
Carl Chalmers	Yes	N/A

Partner Module Team

Contact Name	Applies to all offerings	Offerings
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Teaching Responsibility

LJMU Schools involved in Delivery
Computer Science and Mathematics

Learning Methods

Learning Method Type	Hours
Lecture	11
Practical	11
Tutorial	11

Module Offering(s)

Offering Code	Location	Start Month	Duration
JAN-CTY	CTY	January	12 Weeks

Aims and Outcomes

Aims	To develop knowledge of advanced topics in deep learning at masters level and provide guidance on the purpose, design and development of deep learning projects using advanced constructs. To provide an understanding of the range of tools, techniques and algorithms used in advanced deep learning architectures. To provide help on establishing advanced deep learning design and development principles to successfully complete a deep learning project.
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Learning Outcomes

After completing the module the student should be able to:

Code	Description
MLO1	Demonstrate a deep, systemic understanding of the theoretical principles and objectives of advanced Deep Learning (DL) principles
MLO2	Critically evaluate and determine the applicability of a range of advanced DL concepts and techniques.
MLO3	Select advanced DL algorithms and architectures to solve particular tasks
MLO4	Implement and test different advanced DL algorithms and architectures using a suitable language, e.g. Python and associated frameworks
MLO5	Evaluate advanced DL algorithms and architectures to determine their strengths and weaknesses
MLO6	Critically evaluate the merits of advanced DL techniques and utilise them appropriately.

Module Content

Outline Syllabus
GPU-enabled Machine Learning 2. Convolutional Neural Networks – Part 13. Convolutional Neural Networks – Part 24. Transfer Learning Concepts and Approaches 5. Object Detection 6. Object Segmentation 7. Long-Term Short-Term Deep Neural Networks 8. One Dimensional Convolutional Neural Networks 9. Time Series Deep Learning 10. Natural Language Processing with Deep Learning 11. Real-World Applications of Deep Learning; Future Directions in Deep Learning

Module Overview

This module provides advanced skills required in deep learning to conduct a wide variety of projects in signal processing, object detection, natural language processing and time series analysis. These skills will help to equip you with advanced skills in deep learning. They are practical core requirements for a successful career as a deep learning engineer in industry.

Additional Information

This module provides advanced skills required in deep learning to conduct a wide variety of projects in signal processing, object detection, natural language processing and time series analysis. These skills will help to equip the student with advanced skills in deep learning. These skills will be practical core requirements for a successful career as a deep learning engineer in industry.

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Learning Outcome Mapping
Report	Report	40	0	MLO2, MLO1, MLO6
Artefacts	Prototype	60	0	MLO3, MLO4, MLO5