

Summary Information

Module Code	7145COMP
Formal Module Title	Accelerated Machine 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
Basma Abdulaimma	Yes	N/A

Module Team Member

Contact Name	Applies to all offerings	Offerings
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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
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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 accelerated machine learning at masters level and provide guidance on the purpose, design and development of accelerated machine learning projects. To provide an understanding of how the range of tools, techniques and algorithms can be applied for accelerated machine learning. To provide help on establishing accelerated machine learning design and development principles to successfully complete large scale machine learning projects.
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Learning Outcomes

After completing the module the student should be able to:

Code	Description
MLO1	Describe in depth and detail the theoretical principles and objectives of accelerated Machine Learning (ML) using the Python-based NVIDIA RAPIDS framework
MLO2	Demonstrate deep understanding of relevant RAPIDS ML concepts and techniques
MLO3	Critically select appropriate RAPIDS ML algorithms to solve particular tasks
MLO4	Evaluate RAPIDS ML algorithms to determine their strengths and weaknesses
MLO5	Implement and test different RAPIDS ML algorithms using a suitable language, e.g. Python
MLO6	Evaluate the suitability of different processing architectures for specific computational tasks (CPU/GPU)

Module Content

Outline Syllabus
1. GPU Computing 2. Introduction to CUDA 3. cuDF Analytics 4. cuML Machine Learning 5. cuGraph Graph Analytics 6. Deep Learning 7. Visualisation 8. Apache Arrow 9. Accelerated Data Science 10. Applications in Accelerated Machine Learning 11. Performance, Validation and Model Interpretation; Future Large Scale Machine Learning

Module Overview

This module provides the key skills required in accelerated machine learning to solve large scale machine learning problems. These skills will help to equip you with the fundamental principles of accelerated machine learning to support your final degree project. Furthermore, they will be practical core requirements for a successful career as a machine learning engineer in industry.

Additional Information

This module provides the key skills required in accelerated machine learning to solve large scale machine learning problems. These skills will help to equip the student with the fundamental principles of accelerated machine learning to support the final degree project. Furthermore, these skills will be practical core requirements for a successful career as a machine learning engineer in industry.

Assessments

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