LIVERPOOL JOHN MOORES UNIVERSITY

Autonomous Systems and Machine Learning

Module Information

2022.01, Approved

Summary Information

Module Code	6513ELEMM
Formal Module Title	Autonomous Systems and Machine Learning
Owning School	Engineering
Career	Undergraduate
Credits	20
Academic level	FHEQ Level 6
Grading Schema	40

Teaching Responsibility

LJMU Schools involved in Delivery
LJMU Partner Taught

Partner Teaching Institution

Institution Name
Auston College Myanmar, Yangon, Myanmar

Learning Methods

Learning Method Type	Hours
Lecture	11
Practical	33

Module Offering(s)

Display Name	Location	Start Month	Duration Number Duration Unit
APR-PAR	PAR	April	12 Weeks

Aims and Outcomes

Aims	The aim of this module is to study the fundamentals of computational intelligence (CI) and their potential applications in robotics, and practise some CI-based techniques in the planning and control problems.

After completing the module the student should be able to:

Learning Outcomes

Code	Number	Description
MLO1	1	Analyse the techniques of computational intelligence (CI) and explain their strengths and weaknesses.
MLO2	2	Use CI techniques to solve modern engineering and robotic problems.
MLO3	3	Apply suitable autonomous system based solutions to modern automation problems
MLO4	4	Design and implement machine learning systems

Module Content

Outline Syllabus	Review of CI, Autonomous Systems, Mobile Robots, Robotic Arms.Optimisation, Searching, Heuristic Algorithms, Swarm Intelligence, Generic Algorithms, Particle Swarm Optimisation.Modelling, Data-driven, Artificial Neural Networks, Back Propagation, Deep Networks, Fuzzy Rule-based Systems, Interpretability, Black-box systems.Artificial Intelligence, Machine Learning, Classification, Clustering, Big Data.Planning Algorithms, Motion Planning, Path Planning, Decision Theory, Decision Tree.
Module Overview	
Additional Information	In this module, students study the fundamentals of computational intelligence and their potential applications in robotics through both lectures and practical application.

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Exam	Examination	50	2	MLO1, MLO2, MLO3, MLO4
Report	Practical and Design	50	0	MLO3, MLO4

Module Contacts

Module Leader

Contact Name	Applies to all offerings	Offerings
Qian Zhang	Yes	N/A

Partner Module Team

Contact Name	Applies to all offerings	Offerings