

Summary Information

Module Code	6520CSWUC
Formal Module Title	Computer Graphics and Visualisation
Owning School	Computer Science and Mathematics
Career	Undergraduate
Credits	20
Academic level	FHEQ Level 6
Grading Schema	40

Module Contacts**Module Leader**

Contact Name	Applies to all offerings	Offerings
Hoshang Kolivand	Yes	N/A

Module Team Member

Contact Name	Applies to all offerings	Offerings
Yun Sheng	Yes	N/A

Partner Module Team

Contact Name	Applies to all offerings	Offerings
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Teaching Responsibility

LJMU Schools involved in Delivery
LJMU Partner Taught

Partner Teaching Institution

Institution Name
Westford University College

Learning Methods

Learning Method Type	Hours
Lecture	33
Practical	11

Module Offering(s)

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

Aims and Outcomes

Aims	To use computer Graphic techniques to develop data and information visualization To introduce the theoretical concepts of graphical display, both 2D and 3D, leading to the practical development of visualisation solutions using relevant tools and techniques.
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Learning Outcomes

After completing the module the student should be able to:

Code	Description
MLO1	Critically relate communication requirements to real-time visual graphics.
MLO2	Critically analyse graphics used in interactive data visualization.
MLO3	Apply key concepts in graphical representation on display devices.
MLO4	Evaluate solutions for data and information visualization.

Module Content

Outline Syllabus

Introduction to the application of visualisation and the associated technologies Data Abstraction; data types, statistical data, time series data, etc. Principles of graphics and viewing: Colour, alignment, balance, consistency, contrast, proximity, camera positioning, etc. Type of Visualisation: Data visualisation, information visualisation, concept visualisation. Visualisation Development: Visualisation design, interaction design, data acquisition, data interpretation (parsing) visualisation development – programming, testing and deployment. Principles of geometric objects and transformations, 2D and 3D coordinate systems. vectors, matrices and basic vector/matrix operations. Coordinate Spaces, Euclidean Space vs Vector Space. Introduction to 3D Data Representation and Resource Usage. Polygonal representations of manifolds and functions. Raster vs Vector Graphics Introduction to Rasterisation for real-time 3D visualisation. Pipelined Transformation through the Coordinate Spaces: Local -> Model -> Eye -> H.Clip -> Screen Vertex Operations Pixel Operations. Hidden surface removal 2D and 3D Visualisation in Virtual; Reality and Augmented Reality The role of Visualisation in 21st century

Module Overview

Additional Information

Massive amounts of data are being generated by modern digital systems; there is a demand for rapid and effective analysis and communication of the relevant data. This module covers topics related to interpreting and displaying data for visualisation and techniques to present various types of data in appropriate formats.

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Learning Outcome Mapping
Report	Visualisation Research	50	0	MLO1, MLO2
Artefacts	Application	50	0	MLO3, MLO4