MODULE DESCRIPTOR

Module Title

Computer Vision

Reference	CM4709	Version	1
Created	April 2022	SCQF Level	SCQF 10
Approved	June 2022	SCQF Points	30
Amended		ECTS Points	15

Aims of Module

To enable students to develop computational solutions to understand the content of images and video in a way similar to human perception.

Learning Outcomes for Module

On completion of this module, students are expected to be able to:

1	Critically analyse a range of image processing and image manipulation techniques.
2	Critically evaluate a range of image features extraction and features representation methods.
3	Critically analyse different machine learning and deep learning methods for image classification and object detection and recognition tasks.
4	Create an end-to-end intelligent computer vision solution by applying underlying concepts and theories of modern computer vision.

Indicative Module Content

This module will cover image and video analysis, including image processing methods, classification, object recognition and detection, and object tracking. Core image processing tasks such as image enhancement, sampling, noise removal, filtering and morphological operations. Modern computer vision methods such as Convolutional Neural Networks, deep learning methods for handling images and videos. Object Detection, Localisation and Recognition. Object tracking and motion estimation. Deploying computer-vision solutions for real world problems. Working with relevant tools and technologies such as Python, OpenCV, and Tensorflow.

Module Delivery

The module is delivered in Blended Learning mode using structured online learning materials/activities and directed study, facilitated by regular online tutor support. Workplace Mentor support and work-based learning activities will allow students to contextualise this learning to their own workplace. Face-to-face engagement occurs through annual induction sessions, employer work-site visits, and modular on-campus workshops.

Module Ref:	CM4709 v1

Indicative Student Workload	Full Time	Part Time
Contact Hours	30	N/A
Non-Contact Hours	30	N/A
Placement/Work-Based Learning Experience [Notional] Hours	240	N/A
TOTAL	300	N/A
Actual Placement hours for professional, statutory or regulatory body	240	

ASSESSMENT PLAN

If a major/minor model is used and box is ticked, % weightings below are indicative only.

Component 1

Type:	Coursework	Weighting:	100%	Outcomes Assessed:	1, 2, 3, 4
Description:	A report based on applying computer vision techniques to a case study from the public domain.				

MODULE PERFORMANCE DESCRIPTOR

Explanatory Text

The calculation of the overall grade for this module is based on 100% weighing of C1. An overall minimum grade D is required to pass the module.

Module Grade	Minimum Requirements to achieve Module Grade:
A	The student needs to achieve an A in C1
B	The student needs to achieve a B in C1
C	The student needs to achieve a C in C1
D	The student needs to achieve a D in C1
E	The student needs to achieve an E in C1
F	The student needs to achieve an F in C1
NS	Non-submission of work by published deadline or non-attendance for examination

Module Requirements

Prerequisites for Module	None.
Corequisites for module	None.
Precluded Modules	None.

INDICATIVE BIBLIOGRAPHY

1	J Howse and J Minichino, 2020, ?Learning OpenCV 4 Computer Vision with Python 3: Get to grips with tools, techniques, and algorithms for computer vision and machine learning?, 3rd Edition.
2	Krishnendu Kar, 2020, ?Mastering Computer Vision with TensorFlow 2.x: Build Advanced Computer Vision Applications Using Machine Learning and Deep Learning Techniques.
3	Aurelien Geron 2019, Hands-on Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems.