

Professional Diploma in Computer Vision Systems (Part-time, Online, One Year)

Course Introduction:

Computer Vision is a field of Artificial Intelligence that enables a computing system to derive meaningful information from digital images, video, and related signals.

The programme introduces students to the principles of Computer Vision, rapidly advancing the students knowledge of this innovative field of technology. The programme emphasis is on peer and team learning, critical reflection and feedback incorporating coding challenges in AI and Computer Vision.

The programme will be of interest to those working in engineering and technical roles or graduates with a degree in numerate disciplines including Engineering, Computer science and Physics.

Learning Outcomes:

On successful completion of this programme, the graduate will be able to:

- Utilise and design state of the art computer vision techniques and algorithms for a wide range of applications in automotive safety, manufacturing, security, and consumer devices.
- Work in technical, engineering, and scientific roles requiring computer vision.

Course structure:

The course is online and is self-directed with 15-18hrs commitment per week. A one hour weekly live session will be held 6pm. Tutorials will be held at a time that suits students.

How will students be assessed?

There is no terminal exam. Assessment is based on group work, regular e-tivity assessments including biweekly coding tasks and short online quizzes.

Students complete two future focused professional portfolio modules, which will involve group work and development of a presentation/event on a relevant topic(s).

Final grade will be associated with key project deliverables in each module, as well as engagement in the process week -to-week.

Entry Requirements:

Applicants are normally expected to hold a primary honours degree in a cognate (related) discipline, (minimum H2.2), or equivalent and have at least 5 years of relevant industrial experience.

Alternative Entry Route:

In accordance with the University's policy on the Recognition of Prior Learning candidates who do not meet the minimum entry criteria may be considered. These candidates will be required to submit a portfolio to demonstrate their technical and/or management experience. An interview with the course admission team is also required to ensure candidates have the experience, motivation, and ability to complete and benefit from this course.

Course breakdown:

<p>Semester 1</p> <p>September– December 2022</p>	<p>Introduction to Scientific Computing for AI – CE4021 To prepare students to take a range of Artificial Intelligence related modules by introducing the associated scientific computing, programming language and host platforms.</p> <p>Introduction to Vision - CE5001 This module will introduce students to the principles of Machine & Computer Vision. Key topics such as linear image processing, feature detection and basic object detection are introduced. Practical examples of these techniques are included in the laboratories for this module to increase student engagement with this material.</p>
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<p>Semester 2</p> <p>January– May 2023</p>	<p>Geometric Computer Vision - CE5002 In computer vision, we replicate this through geometric processing. Geometry is used to describe the structure and shape of the environment in which a camera is located. Geometric computer vision is, therefore, the process of determining the structure of the environment, and the position and orientation of the camera, and how the camera moves, with respect to the environment, through the analysis of camera image streams. It is commonly used in mobile robotics, vehicle autonomy and augmented reality.</p> <p>Intelligent Visual Computing & Applications This module will focus on the use of state-of-the art Deep Learning techniques in specific Machine/Computer vision applications. This model follows on from previous Machine Vision and Geometric Computer Vision modules where students have previously studied traditional machine/computer vision methods and have also been introduced to the standard deep learning vision applications (classification, object detection and semantic segmentation). This model enables students to obtain broader understanding of practical applications of deep learning techniques in vision, through a series of lectures, student engagement activities and completion of coding tasks.</p>
<p>Both Semesters:</p>	<p>Future Focused Professional Portfolio 1&2: Participants will be guided in the organisation of a series of future facing industry relevant talks on the technology and the future of markets and society more broadly. Participants will work collaboratively to identify key trends impacting their field/discipline and create and use their professional network to reach out to key thought leaders in this space. This module provides learners with an opportunity to demonstrate independent and self-determined learning through the creation of their individual portfolio. The portfolio includes a range of activities that enable the learner to demonstrate: the development of their reflective practice, evidence-based excellence in applying discipline specific knowledge in different contexts, and leading discussion on the future of their respective discipline.</p>

Summary detail

Course Schedule:

- Dates:
 - **Semester 1:** September – December - **Semester 2:** January – May. *Final dates TBC.*
 - Application closing date: August 2022
 - Induction will take place over one/two days one week prior to the start date
- Timetable: Weekly online lectures, 2 hours per week + self-directed learning and group work. Two lectures, Evenings and weekends, all lectures will be recorded. Live sessions will be at a time suitable to the student group
- Delivery Method: Online via the University of Limerick Virtual Learning Environment - Sulis

Course fee:

- EU - €3,500
- Non EU - €4,750

A €250 (€600 non EU) deposit is required once an offer is issued to secure a place)

How to apply:

Simply click on the link below and click “Apply”. You can review the full application form without submitting and save your application as you go along.

<https://www.ul.ie/gps/computer-vision-systems-professional-diploma-ulwork>

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Course Director Profile:



Dr. Tony Scanlan

Dr. Scanlan is a Senior Research Fellow in the UL Dept. of Electronic & Computer Engineering. He has extensive experience in the field of microelectronics and signal processing in association with multinational and SME industrial partners.

Dr. Scanlan's current research interests are in the application of Artificial Intelligence (AI) & computer vision to manufacturing inspection, environmental monitoring and consumer & media applications.



Dr. Ciarán Eising

Dr. Eising has extensive experience working in computer vision, having worked for >15 years designing computer vision algorithms and systems for driver assistance and automated driving solutions with Valeo Vision Systems.

His research in UL focuses on the applications of artificial intelligence and computer vision in areas such as medical imaging, waste management and automated driving.



Dr. Pepijn van de Ven

Dr. van de Ven is a Senior Lecturer in Artificial Intelligence and Machine Learning and a Course Director for UL's national online MSc in AI, an industry driven fast-paced masters to upskill Ireland's workforce in use of Artificial Intelligence.

Frequently Asked Questions

Is there a list of companies & industries that are the ideal fit? Companies where Computer Vision

Systems is prevalent include, but are not limited to: AMCS, Amazon, Analog Devices, Cainthuis, Colins Aerospace, Dataminr, Emdalo Technologies, Ericsson, Facebook, Huawei, IBM, Intel, Jaguar Land Rover, Johnson & Johnson, Qualcomm, Shutterstock, Valeo Vision Systems, Xperi, GM, Twitter

What software/ programmes will they be using?

Python packages including, Numpy, sklearn, OpenCV, Tensorflow with access to this software via Google Colab. However, prospective students do not need to already have experience with these tools – you will be taught them during the programme.

Does the learner need access to anything? Eg. Data, software?

Access to a reasonably modern PC and a good internet connection that is suitable for live video lectures. All software used in the programme is open source and freely available.