**About the Project**

We invite expressions of interest from applicants with a first or upper second-class honours degree in a science or engineering for a full-time, 4-year PhD scholarship in addressing image analysis during advanced manufacturing processing. This PhD project will be supervised by Dr Kevin Nolan ([kevin.nolan@ucd.ie](mailto:kevin.nolan@ucd.ie)). The PhD Project is jointly funded by I-FORM, the Research Ireland Centre for Advanced Manufacturing and Digital Manufacturing Ireland (DMI), [*https://www.i-form.ie*](https://www.i-form.ie)*, https://www.dmireland.org*

The successful candidate will spend time at the I-Form Centre in University College Dublin, along with DMI’s state of the art manufacturing facility in Limerick.

**PhD Overview:** The objective is to develop and validate image analysis techniques for precision measurements of nano-size features on manufactured parts during processing. Dedicated AI algorithms will be developed, tested and evaluated in practical case studies ranging from micro manufacturing at submicron precision to nano-sized electronic components with precision requirements under 1 μm. The automation of quality inspection in manufacturing is critical for directly assessing product quality features, such as dimensional accuracy (geometry) and surface defects, which are traditionally gauged through costly and time-consuming methods like tactile 3D systems or computed tomography, or subjective manual inspection by trained workers. Laboratory prototype development of vision-based inspection systems for manufactured products will be carried out at DMI’s new VCMG laboratory.

Amongst the objectives will be to enhance the accuracy & precision metrics for inspection of complex 3D shapes. This will be achieved by:

• Development of customised and robust computer vision methods to retrieve the geometry and surface defects of complex 3D-shaped parts, including techniques such as light field, photometric stereo, and structured light.

• Development and implementation of control algorithms and computer vision methods for continuous path planning and quality control of complex 3D-shaped parts.

• Define and establish visibility and accuracy & precision metrics for continuous view path operation and quantification of the obtained 3D data, respectively.

**Living allowance (Stipend):**€28,000 per annum, [scholarship award]

**University fees:**Covered by the scholarship in addition to stipend

**Closing date for applications:**16th January, 2025

Please submit your Expression of Interest with a CV by email to [**info@i-form.ie**](javascript:void(0))