**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). 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**

**About the Project**

We invite expressions of interest from applicants with a first or upper second-class honours degree in business or related discipline for a full-time, 4-year PhD scholarship in addressing the human side of implementing digital technologies (particularly artificial intelligence), within a manufacturing environment. This PhD project will be supervised by Assoc. Prof. Orla Byrne (orla.byrne@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.dmireland.org

The successful candidate will spend time at the Smurfit School of Business at University College Dublin, along with DMI’s facility in Limerick.

**PhD Overview:** Manufacturing companies in Ireland are undergoing a digital transformation, implementing new digital technologies to improve all aspects of the manufacturing process. Adopting AI for example, has great potential to boost efficiency and socio-ecological sustainability. AI could significantly improve labour efficiency by removing repetitive tasks, facilitating automating monotonous and, in some cases, dangerous work tasks, thereby enhancing worker well-being and workplace conditions.

The introduction of new digital technologies, however, will require a degree of task reorganisation and upskilling of employees, which may exacerbate social inequalities among workers and alienate employees. Furthermore, cultural barriers and fear could mean a reluctance to embrace new skills, and an aversion to risk-taking.

High quality empirical research is needed to understand how to protect and promote employee wellbeing in the Irish context and beyond, while simultaneously retaining a competitive edge. This area of research is known as human-centric manufacturing and involves fully engaging humans in decision making and operations while leveraging advanced digital technologies.

The successful applicant will work within a small team focused on human-centric manufacturing, to publish excellent research, and identify best practices for the adoption of artificial intelligence (AI) within Irish manufacturing. The longer-term objective will be to help inform critical Government policy decisions in this area.

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

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

**Closing date for applications:**9th January, 2025

Please submit your Expression of Interest with a CV by email to **info@i-form.ie**