MIDLANDS CENTRE
For Data-Driven Metrology

Topic: Intelligent 3D scanning for complex objects
Location: The University of Nottingham

In this project the student will develop a smart photogrammetry instrument for quantifiably accurate measurement of complex objects in a compact setup. The student will use machine learning methods to improve data coverage, measurement accuracy and to minimise measurement time. A method to quantify the confidence limit (measurement uncertainty) of the model and specific measurement algorithms for related feature measurements of an artefact will be developed. This project will develop a user-friendly measurement system able to feed back to their specific measurement requirements. The final step will be to mount the photogrammetry system on to a robot arm to increase portability and measurement volume for measurement of larger objects in the field.

The project will be supervised by Dr Samanta Piano, from the Manufacturing Metrology Team (MMT). MMT is an international and diverse team that thrives on openness and cooperation – students work in teams to achieve joint goals in a friendly but professional cohort.

The position is available for UK candidates, but EU or International applicants who can pay the difference between the Home and International Fees would also be welcome to apply.
Candidates must possess or expect to obtain, a high 2:1 or 1st class degree in science, engineering or computer science, or other relevant discipline.

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Supervisor: Dr Samanta Piano

Dr Samanta Piano is Assistant Professor in Metrology and deputy director of the Manufacturing Metrology team at the University of Nottingham (UoN). Her research interests concern the development of innovative and unconventional optical techniques and 3D probing systems for high-precision coordinate metrology to be used in industrial applications. She is currently investigating how artificial intelligence approaches can be used for camera calibration in 3D measurement systems. She is a former Marie Curie and UoN Advanced Research Fellow who has contributed to several forefront areas of experimental condensed matter physics, materials science, atomic and optical physics, metrology and nanotechnology. She has published in international peer reviewed journals, including three papers in the prestigious Physical Review Letters, one in Applied Physics Letters, and six refereed book chapters. She is currently co-supervising five PhD students, working on novel optical measurement techniques, defects in additive manufacturing and machine learning techniques for 3D optical measurements.