

Topic: Uncertainty evaluation with point cloud data

Location: The University of Nottingham

In this research project, the student will explore what we currently know about measurement uncertainty associated to high-density measurement of part geometry and surface texture. The student will acquire expertise in investigating and understanding error sources associated to state-of-the-art measurement technologies, and will work towards the objective of increasing our understanding of how error propagates through the measurement process, ultimately affecting the primary dataset resulting from measurement, i.e. the point cloud or volumetric data. The student will then investigate how error in the point cloud/volumetric data may propagate through the algorithmic procedures commonly applied at the industrial level to verify whether a part conforms to geometric and dimensional specifications, ultimately investigating solutions for the accurate estimation of uncertainty associated to the verification process, thus providing a fundamental contribution towards the development of manufacturing solutions of the future.

The project will be supervised by Professor Richard Leach, 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 mathematics, science or engineering, or other relevant discipline.

Supervisor: Professor Richard Leach



Richard is currently a Professor in Metrology at the University of Nottingham, Director of the Midlands Centre for Data-Driven Metrology, Head of the Manufacturing Metrology Team and prior to this spent 25 years at the National Physical Laboratory. He has been researching and lecturing on surface metrology for over 30 years. He is on the Council of the European Society of Precision

Engineering and Nanotechnology, the Board of the American Society of Precision Engineering and several international standards committees. He is the European Editor-in-Chief for Precision Engineering and has over 500 publications including eight textbooks. He is a Fellow of the International Academy of Production Engineering (CIRP), the Institute of Physics, the Institution of Engineering & Technology, the Higher Education Authority, the Institute of Measurement & Control, and the International Society of Nanomanufacturing. He is a visiting professor at Loughborough University and the Harbin Institute of Technology.