

**Topic: Creating digital twins using AI for automation and robotics**  
**Location: Loughborough University**

Digital twins are an essential concept within industry 4.0. Their aim is to allow physical manufacturing assets to be closely represented within a digital model of a manufacturing system. Using multiple digital twins, equipment, machines, automation systems, robotics or manufacturing processes can be integrated digitally, to allow testing, programming, and verification, prior to purchase and installation of physical assets. A metrology framework to support highly detailed digital twins has yet to be defined. This PhD study will investigate the measurement and modelling approaches using AI and machine learning, plus digital traceability suitable for creating highly accurate and detailed digital twins of robotic automation systems.

The project will be supervised by Dr Peter Kinnell and Dr Niels Lohse, from the Wolfson School of Mechanical Electrical and Manufacturing Engineering.

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 1<sup>st</sup> class degree in a related science or engineering discipline.

### **Supervisor: Dr Niels Lohse**



Is a Reader in Manufacturing Automation and Robotics. He is the Director of the Intelligent Automation Centre at Loughborough University. His research interests are in the field of intelligent automation and include manufacturing system modelling, human-machine interaction, distributed control, diagnostics and design decision-support with a primary focus on modular and evolvable production systems and applications of artificial intelligence techniques in manufacturing.

### **Supervisor: Dr Peter Kinnell**



Is a Reader in Metrology and held an EPSRC Manufacturing Fellowship in Collaborative Metrology for High Value Manufacturing. He is the assoc. Director of the Intelligent Automation Centre at Loughborough University where he leads the research team working on 3D vision for robust intelligent measurement. He is currently working on the creation of new sensing technology, new algorithms for advanced data processing, and implementing measurement systems within automation and manufacturing systems.