



## Hybrid Metrology for Automated Inspection of Large-scale Workpiece Surfaces

EPSRC funded PhD studentship with full fee waiver and £21,805 pa stipend (2026/27 rate)

**Project Code:** DLA\_DTP\_2026\_15

**Main Supervisor:** [Dr Shan Lou](#)

**Co-Supervisor:** [Professor Andrew Longstaff](#),  
[Dr Simon Fletcher](#), [Professor Dame Jane Jiang](#)

### Project Introduction

This PhD project addresses the challenge of inspecting large, complex engineering components that are difficult to measure using conventional systems. It will develop a hybrid metrology platform combining a structured light sensor, an industrial robot, and multi-view photogrammetry to enable accurate, automated, and large-scale surface measurement. The research focuses on uncertainty-aware robot control and metrology system integration to ensure reliable measurement performance in industrial environments. The system will be validated through nuclear-sector case studies in collaboration with the National Physical Laboratory and the Advanced Manufacturing Research Centre.

### Project Details

Modern manufacturing increasingly depends on fast, flexible, and automated metrology solutions, particularly for oversized components that are difficult or impossible to measure using conventional systems. Traditional approaches typically require additional setup to extend measurement sensor's range so that it can cover the entire surface of a large workpiece. These setups are often manually executed, making the process time-consuming, highly reliant on operator experience, and prone to inconsistent measurement performance that may fall short of industrial requirements.

This PhD research project aims to develop a hybrid dimensional metrology solution that integrates a precision structured light sensor, an industrial robot arm, and a multi-view photogrammetry system.

The combined metrology system will enable high-efficient automated inspection of complex, large-scale engineering components used in advanced manufacturing sectors, such as the nuclear energy industry.

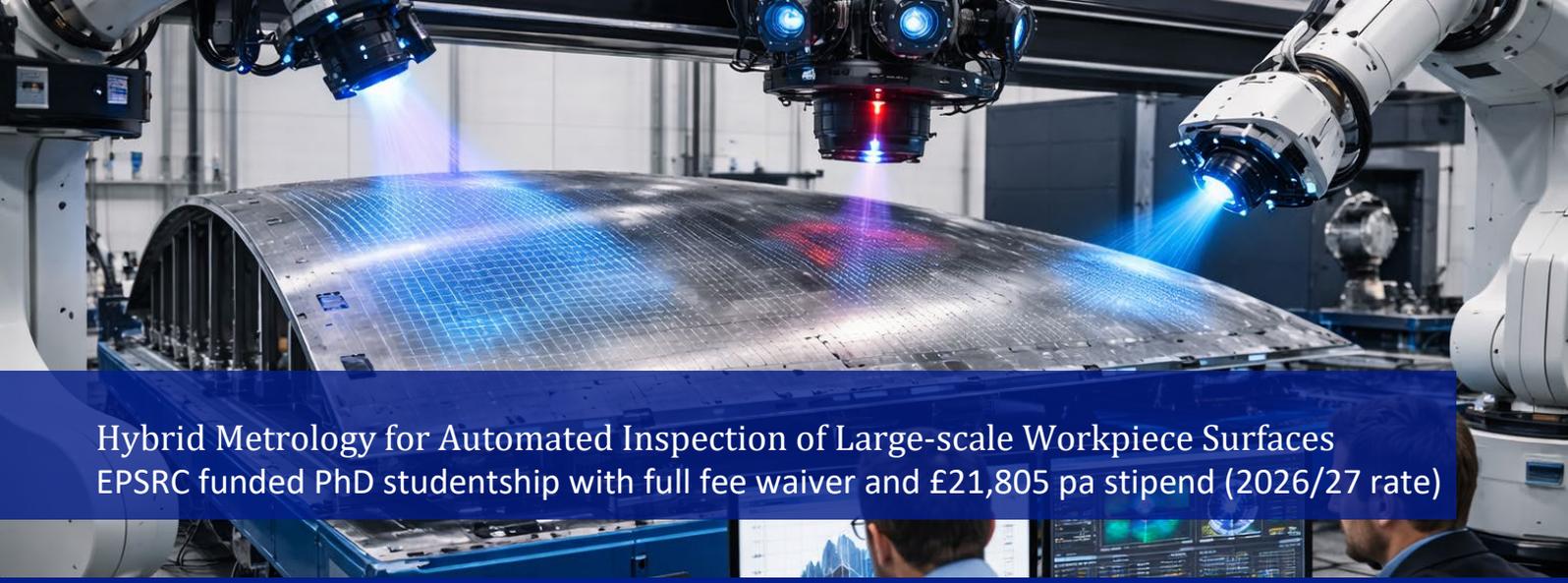
This project will be fulfilled via the following four core research objectives:

- 1) Undertake a systematic evaluation and comparative analysis of metrology-informed feedback-control strategies to improve the positioning accuracy of robot arms within precision-critical manufacturing environments.
- 2) Investigate strategies to incorporate the measurement uncertainty of the external large volume metrology system into the robot control process.
- 3) Develop a hybrid metrology solution for efficient, automated measurement of large workpiece surfaces by combining a structured light sensor, a photogrammetry system, and an industrial robot arm.
- 4) Conduct industrial case studies on nuclear-sector workpieces larger than one metre, demonstrating system capability in real manufacturing environments.

This project will take collaboration with two major UK R&D partners:

Manufacturing Metrology Group @ National Physical Laboratory (NPL, UK's national measurement institute) will provide access to large volume metrology facility and expertise in measurement uncertainty quantification.

Nuclear Manufacturing Group @ Advance Manufacturing Research Centre (AMRC, UK's High Value Manufacturing catapult centre) will contribute expertise in large surface inspection and support industrial case studies.



## Hybrid Metrology for Automated Inspection of Large-scale Workpiece Surfaces

EPSRC funded PhD studentship with full fee waiver and £21,805 pa stipend (2026/27 rate)

### Project-specific entry requirements

- 1) Hold a high-grade qualification, at least the equivalent of a UK First or 2:1 class degree or MSc in engineering or related disciplines
- 2) Be proficient in both written and spoken English, and possess excellent presentation and communication skills
- 3) Experience with instrumentation and robot programming is advantageous.

### Further Information

This call is open to **UK Applicants only**.

Applicants should be of outstanding quality and exceptionally motivated.

The studentships are funded for 3 years (subject to satisfactory annual performance and progression review) and will provide for tuition fees and a tax-free stipend paid monthly.

Please note that there are more projects than funded studentships available and therefore this is a competitive application process which will include an interview. Shortlisted candidates will be contacted for an interview in person or via Teams. After interview the most outstanding applicants will be offered a studentship.

Queries about the application process are welcome and should be emailed to [pgrscholarships@hud.ac.uk](mailto:pgrscholarships@hud.ac.uk).

Informal enquiries about this project should be directed to [Dr Shan Lou](#).

**Type of Award:** Doctor of Philosophy (PhD).

**Eligibility:** UK applicants only. First Class or Upper Second-Class Honours degree or equivalent in a relevant subject area, please refer to the entry requirements on the specific projects being advertised.

**Location:** Huddersfield.

**Funding:** 3 years full time research covering tuition fees and a tax-free bursary (stipend) starting at £21,805 for 2026/27 and increasing in line with the EPSRC guidelines for the subsequent years. Funded via the Engineering and Physical Sciences Research Council Doctoral Training Programme.

**Duration:** 3 years full-time plus 12 months writing up (please note no funding available for writing up period).

**Closing date:** 28<sup>th</sup> April 2026

**Start date:** 1<sup>st</sup> October 2026

### Application details

- Go to the EPSRC webpage and download the [Expression of Interest Form 2026](#).
- Provide copies of transcripts & certificates of all relevant academic and professional qualifications.
- Provide references from two individuals – please contact your referees and ask them to send them directly to [pgrscholarships@hud.ac.uk](mailto:pgrscholarships@hud.ac.uk) from their email address.
- Proof of eligibility – e.g. scan of passport photo page.
- Completed forms, including all relevant documents should be submitted via-email to [pgrscholarships@hud.ac.uk](mailto:pgrscholarships@hud.ac.uk).

**Please note:** if you do not attach all the relevant documentation prior to the closing date your application will not be considered.