

Fully Funded EPSRC PhD Case studentship.

Project Title: A Smart Geometric Information System

Current manufacturing technologies are evolving towards a digitalised and intelligent era where advanced manufacturing systems will become autonomous, self-aware, and self-correcting. Manufacturing systems should be worked harmoniously and collaboratively with as little human intervention as possible. The autonomous factory will not only use data from sensor networks from the manufacturing value chain but must also be able to access the vast amount of human accrued manufacturing knowledge to make informed decisions. To start, a great deal of multidisciplinary knowledge and information has to be represented in a smart machine readable format and further be interrogated and reasoned. Using advanced knowledge representation technologies, the fusion of knowledge from surface design, production and verification can then be encapsulated and represented in an integrated framework to enable stable and unambiguous real-time knowledge transfer and exchange between different stages in the manufacturing value chain.

This PhD project is ambitious in developing a smart geometric information platform using Renishaw's products and applications as starting patterns. The platform will integrate three major components that are: the design, manufacture and verification, the advanced characterisation of geometric data will also be incorporated into the measurement component. Objectives of the project will include: Model customised surface design/manufacture/measurement semantics using categorical based knowledge representation method; Design and develop the structural framework of the integrated information platform, using our centre's previous version of CatSurf as a reference; integrate methods and algorithms for association, filtration and numerical parameterisation into the measurement component of the platform, Populate the information platform with Renishaw knowledge, test and verify the correctness of the platform.

Eligibility: Applicants must hold a UK 1st or 2:1 class degree, MSc with distinction or equivalent qualification in Physics, Mathematics, Engineering or related disciplines. Applicants must be proficient in both written and spoken English, and possess excellent presentation and communication skills. Applicants must also meet standard EPSRC eligibility criteria for studentships, full details can be found at <https://epsrc.ukri.org/skills/students/help/eligibility/>

Salary: £15,285 (2020/21 EPSRC Standard)

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