



Infrastructure for Freeform Surface Characterization

Jane Jiang

University of Huddersfield
Email: x.jiang@hud.ac.uk

Freeform surfaces have become increasingly important and are appearing more and more in new generations of optical surfaces. With a complex nature and containing points that have non-zero Gaussian curvatures by design, we have treated such surfaces as non-Euclidean Geometries and worked on the basis that they can no longer be represented using height values over planar lattices, as is the case with current areal surface measurement. This talk focuses on the development of infrastructure for freeform surface characterization, including: discrete/continuous surface metrology representations for non-Euclidean geometries using mesh-based apex normal representations, finding that decomposition (an inverse problem) can be used to solve the non-uniqueness problem of freeform shape; Filtration based on Diffusion Equations (PDEs) and Morphology (alpha-shape) and numeric characterisation for parametric surface

SHORT BIO:

Metrology and is the Director of the EPSRC Future Metrology Hub. She obtained her PhD in measurement science in 1995, a Professorial Chair in 2003, a DSc for precision engineering in 2007. She received a Damehood in the 2017 Queen's Birthday Honours for services to manufacturing and engineering.

Jane's research involves advanced metrology with two major aspects: i) mathematical models and algorithms for surface texture analysis, filtration and parametric characterisation and ii) optical measurement technologies for embedded sensors/instruments applying to autonomous manufacturing.

Jane is a Fellow of the Royal Academy of Engineering (FREng), a Fellow of the International Academy of Production Research (FCIRP), the Institute of Engineering Technology (FIET). She has published more than 400 journal papers; was awarded a Royal Society Wolfson Research Merit Award in 2006 and the Sir Harold Hartley Medal and IET Innovation Awards in 2014.