

Head, Shoulders Knees and Toes - Human-Centred Tribology

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ABSTRACT

Tribology is the study of friction and wear, and affects a wide range of aspects of our life. Friction results in energy losses whilst wear causes material degradation, component failure and inefficient operation of machinery. Tribology also covers many aspects in and on the human body, and we typically only become aware of this when things stop functioning as they should. Examples are widespread, from arthritic joints to gritty eyes and from skin blisters to bruxism. A key research question in these cases is something along the lines of “What is the relationship between the tribological performance and a person’s experience in terms of perception, (dis-)comfort, injury and pain.”

Investigating these biotribological aspects requires a different approach to that commonly used in tribological testing. Many of the inherent assumptions and simplifications we make when experimentally investigating rigid engineering materials do not hold for soft(er) tissue. Deformations are typically large, contact pressures very low, the contacting geometries are variable and poorly-defined and the materials behave in a rather complex manner. Attempts to accommodate these complexities in experiments have resulted in a wide range of creative set-ups and investigations, which are sometimes elegant in their simplicity, but unfortunately often incredibly complex.

ABOUT THE SPEAKER

Dr. Marc Masen is a Reader in Tribology and Mechanical Engineering Design at Imperial College London.

Marc's main areas of research are tribology of human tissue, tribology of elastomers and polymers, wear prevention and wear mechanisms and tribometer development.

Marc received his MSc and PhD degrees in Mechanical Engineering from the University of Twente in the Netherlands. His PhD thesis was entitled ‘Abrasive Tool Wear in Metal Forming Processes.’ Following his PhD Marc worked at the R&D centre of Hydro Aluminium with a focus on investigating the surface quality of aluminium extrusions.



July 18, 2024, 3:30 PM, AR Auditorium, Mechanical Engineering, IISc