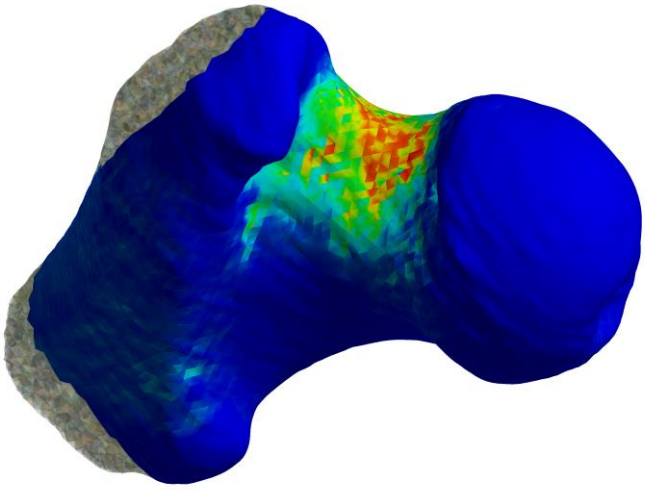
KTH SOLID MECHANICS KEYNOTE SEMINAR; Thursday, January 12th, 16.15; https://kth-se.zoom.us/j/65663530537

Marco Viceconti

"From Solid Mechanics to In Silico Trials"

The frailty associated with ageing manifests in many ways, but the proximal femur fracture is particularly critical. Fragile elders tend, for many reasons, to fall more frequently; this, combined with the progressive loss of bone mass, sometimes produces the so-called fragility fractures, bone fractures caused by low energy impacts. Of all fragility fractures, the proximal femur fracture (PFF) is the most debilitating: it always requires surgery, kills around 25% of patients due to related complications within a year, and leaves some permanent functional disabilities in another third. But until the fracture occurs, the subject is fine and has no evident symptoms. Thus, predicting who is at risk of PFF is a clinical holy grail. A body falling, impacting the ground, and a bone fracturing because of the impact, sounds like an event where biomechanics plays a bigger role than biology. This has driven various research groups to explore the development of patient-specific biophysics models that could predict the risk of PFF in a patient. Over the years, these digital twins in healthcare became quite accurate, to the point where they are now commercialised as clinical decision support systems. In this seminar, we present the journey to develop and validate one of such tools and how now that digital twin technology is being adapted to become a full-blown In Silico Trial to test the efficacy of new treatments.



Marco Viceconti is a full professor of Industrial Bioengineering in the department of Industrial Engineering of the Alma Mater Studiorum – University of Bologna and Director of the Medical Technology Lab of the Rizzoli Orthopaedic Institute. Prof Viceconti is an expert in In Silico Trials, the use of subject-specific modelling to test new medical products. He is one of the key figures in the in silico medicine international community: he founded the VPH Institute and drove the creation of the Avicenna Alliance. He served as President of the European Society of Biomechanics and is currently one of 25 members of the World Council of Biomechanics. In 2018 he became a Fellow of the UK Royal Academy of Engineering; in 2021, he received the Huiskes Medal for Biomechanics. According to SCOPUS he published 377 papers (H-index = 55).