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Seminar: Supercomputer - based virtual humans

Friday 26 September 2025 18:45 (1 hour)

In this talk we are going to address the potential of supercomputer-based virtual humans for the biomedical realm. Virtual Humans are computational «avatars» of a patient, which combine patients' data with a mathematical model that are used to predict some quantities of interest, under a context of use and used to support medical decisions. The virtual human is based on mathematical models that are a combination of first principles and artificial intelligence, which, given the high level of complexity, requires the (efficient) use of supercomputing resources. We will show examples of Populations of Virtual Humans used as cohorts for in-silico clinical trials to optimize drug and devise-based therapies, make clinical diagnosis and understand cardiac pathology evolution.

Short Bio: Eva Casoni, senior scientist

Eva Casoni is a senior scientist at the ELEM Biotech (The Virtual Humans Factory), a spinoff company of the Spanish Barcelona Supercomputing Center (BSC), founded with the goal of speeding-up the technology transfer of BSC modelling technology for the biomedical domain, in particular, the code Alya. She is also a collaborator at the BSC, with more than 70 scientists and developers.

Graduated in Mathematics and Doctor in Applied Mathematics from the Polytechnic University of Catalonia (UPC), Spain, in 2011, she completed her doctoral thesis in Computational Fluid Mechanics (on numerical schemes for stabilization of compressible flow equations for finite elements). She has carried out doctoral and postdoctoral stays at the Aerospace Computational Design Laboratory of MIT (USA), at Airbus company and at the Polytechnic University of Madrid (UPM) in domain decomposition methods for compressible and incompressible flow for aerospace engineering. She has been a lecturer at UPC, UPM and UPF. In 2013 she joined the Barcelona Supercomputer Center as a researcher and lead the Computational solid mechanics group. In 2018, her scientific interests experienced the irresistible grasp of computational biomedicine until this day (and counting).

Presenter: Dr CASONI, Eva (ELEM Biotech & Barcelona Supercomputing Center)