



Tuesday 21 May 2026, 15:00-16:00, 3227.0030 (Anda Kerkhoven Centre)

Lecturer: Ana de Sousa, assistant professor at Instituto Químico de Sarriá (Spain).



Title - From signals to digital twins: control and biomechanical modelling for advanced rehabilitation

Abstract - Advances in human movement sciences increasingly rely on the integration of experimental data, computational modelling, and control strategies to understand and enhance motor function. In this lecture, I present a research framework that combines signal acquisition, biomechanical simulations, and control techniques to develop assistive and rehabilitation technologies. Emphasis is placed on the use of predictive simulations and digital twins to explore “what-if” scenarios and estimate variables that are difficult or impossible to measure experimentally, such as joint contact forces. Applications include functional electrical stimulation and sensor-based control of movement, with the goal of improving autonomy for individuals with motor impairments. This work highlights how bridging biomechanics, control engineering, and real-world data can lead to more effective and personalised rehabilitation solutions.