

Title: Supporting the development of an ecosystem for Digital Twins in healthcare

Tutor: Prof Marco Viceconti - <https://www.unibo.it/sitoweb/marco.viceconti/en>

Funding source:

€25,000 on the EDITH project: An ecosystem for digital twins in healthcare G.A. n. 101083771–CUP J53C22002920006, Scientific Supervisor Prof. Marco Viceconti.

Research Project

Ecosystem for Digital Twins in Healthcare (EDITH) is a Coordination and Support Actions (CSA) project founded by the European Commission under the Digital Europe Programme (DIGITAL-2021-DEPLOY-01-TWINS-HEALTH). The project aims to foster an inclusive and sustainable ecosystem for Digital Twins in healthcare (DTH) in Europe.

Activity plan

The selected researcher will mainly work on the:

- orchestration of the computational models used to predict the femoral bone strength
- automatic creation of multiple digital twins for the validation of the methodology
- integration of the use case in the federated cloud-based repository of human digital twins

Place of work: all activities will take place at the institutional sites of the department DIN, or at the Istituto Ortopedico Rizzoli (Bologna).

Short description

As part of the team of EDITH, the candidate will work on the digital twin ecosystem building by integrating a specific digital twin methodology in the federated cloud-based repository of human digital twins. The in silico model solution is called Bologna Biomechanical Computed Tomography (BBCT) and is a digital twin methodology deployed on HPC clusters that uses a subject-specific FE model to predict femoral bone strength. Quantitative Computed Tomography (QCT) scans of the hip region and patient data inform a patient-specific computer model able to predict the risk of hip fracture when the CT is performed.

The ideal candidate would have these qualifications:

- Master's degree in Engineering or Computer Science
- Good English language knowledge.
- Knowledge in computer modelling and simulation, digital twins, and health data.
- Experience with finite element analysis and biomechanics.
- Programming experience in Python

The candidate will work in a multidisciplinary team coordinated by Prof. Marco Viceconti and in collaboration with a large international consortium.