Joint project-based training of medical, biology and engineering students on data science and computational models in biomedicine

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In most medical and biology schools, advanced computational tools and technologies based on modern concepts such as data science and computational models do not take part of their degree curricula, despite their disrupting impact on biomedical research. Therefore, clinicians and biologists need to train and upgrade their technological abilities mainly on their own. At the same time, engineering students rarely have the opportunity during their studies to work with colleagues of other degrees in order to put into practice their methodological skills to solve real biomedical problems. At Universitat Pompeu Fabra (UPF), Barcelona, inspired by similar initiatives implemented at University College London (UCL) under the umbrella of the CompBioMed EU project, we have designed an elective course to integrate students from medicine, biological, engineering and data science degrees around projects on computational techniques in biomedicine. Basic concepts, adapted to the level of each student's typology, will be given on data science, artificial intelligence and machine (deep) learning, digital twin, visual analytics and high-performance computing. The students will work together in multidisciplinary teams leveraging the complementary skills from each discipline. Clinician-friendly tutorials of computational tools to perform cardiac electrophysiological simulations on patient-specific left ventricular geometries were prepared by a biomedical engineering student, Núria Moya, as part of her undergraduate thesis. The subject will be implemented in collaboration with the Barcelona Supercomputing Centre, which will facilitate the access to computational resources, and UCL collaborators. The main goal of this talk is to provide details of the planned subject and on the implementation across several faculties and departments of a university.