

INTEGRATION OF CLINICAL DATA AND NUMERICAL METHODS FOR CARDIOVASCULAR PROBLEMS

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MINI-SYMPOSIUM PROPOSAL

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New algorithmic challenges are rapidly arising in healthcare thanks to increasing availability of high-resolution clinical data. These include cine-MRI to assess cardiac function (and related pathology like hypertrophic/dilated cardiomyopathy), phase contrast MRI or echocardiography for blood flow quantification and diagnosis of cardiac valves dysfunction, stress-CT to investigate myocardial perfusion, CT-angiography to detect vascular abnormalities like stenosis or aneurysms, and activation maps of the ventricles and the atria measured with catheters or through non-invasive electrocardiographic imaging.

Computational and data-science research can support many aspects of medical practice, ranging from pathology diagnosis to treatment design and optimization. Great impact can be achieved by developing and implementing suitable strategies for the integration of clinical data with numerical and computational strategies. This integration can lead to accurate results, often simplifying the mathematical models, and provide non-invasive information that could be useful to clinicians and potentially improve clinical data acquisition and procedures.

This mini-symposium aims at gathering scientists whose research focuses on merging clinical data and numerical models in different fields of cardiovascular modelling, such as ventricular and arterial blood flow dynamics, myocardial perfusion, cardiac electro-physiology and cardiac mechanics.