Title : Automated images segmentation of aortic aneurysms with geometrical characterization using ROMs for synthetic data generation

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Abstract : Hemodynamic simulation has an important potential for risk stratification of patients with aortic aneurysms in addition with morphological characterization. However, several issues are still unsolved to be able to perform such simulations in a clinical setting. First, geometries have to be extracted accurately and automatically based on CT images which is the gold standard exam. Second, the morphological characterization plays a first key role in the clinical decision making process to decide wether or not the patient will need to undergo surgery. Third, the hemodynamic simulation would be an important add-on to this process if it can be fully automatized and robust in order to be used directly by physicians. In this presentation we will address the first two topics that are the first key steps for an initial integration of innovative tools in a clinical setting. In particular we will present different approaches for image segmentation with the different challenges due to image variability that need to be addressed. Then, we will present an innovative approach using ROMs for morphological characterization and synthetic data generation as a first step to address risk stratification.