Cardiovascular Imaging: advanced computational techniques for 4D data representation, quantification and surgical planning

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4D imaging represents a huge source of information that is clearly underexploited in the clinical setting. Computational techniques derived from standard fluid dynamics and structural simulation software can be usefully implemented for an intuitive representation of the imaging data. Moreover, they can condense the information and provide synthetic and quantitative data to be used for risk stratification analysis in an unprecedented way.

All these data can then be used in combination with advanced visualization tools, such as augmented or mixed reality glasses, or with numerical simulation tools, such as finite element, spring mass or finite volume models, to obtain patient specific models to be used for surgical planning, teaching and training purposes