

Modeling and Simulation of Cardiovascular Systems

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Different disciplines explore the human body at various levels ranging from the entire body to organ level over the tissue structure down to the protein and gene level. However, there seems to be a lack of bridges between these disciplines. This presentation tries to show how visualization can help bridge between these disciplines by presenting an ongoing project that incorporates two of these levels: the organ and the tissue structure. Different methodologies are presented that abstract from volumetric imagery and extract quantitative data in order to - in the long term - develop a model of the human heart. The volumetric images used throughout this project stem from the organ itself to derive geometric and morphometric properties of the vasculature as well as from tissue samples to determine mechanical properties of the individual vessels.