Transcatheter Aortic Valve Implantation (TAVI)

Problem: Until recently, heart valve failure has been treated adopting open-heart surgery techniques and cardiopulmonary bypass. However, over the last decade, minimally-invasive procedures have been developed to avoid high risks associated with conventional open-chest valve replacement techniques. Such a recent and innovative procedure represents an optimal field for investigations through virtual computer-based simulations. In particular, we aim at simulating the whole prosthetic device virtually implanted in a patient-specific aortic root created by processing medical images

Objective: Evaluate postoperative prosthesis performance in dependence on different factors (e.g., device size and prosthesis placement site, etc…).
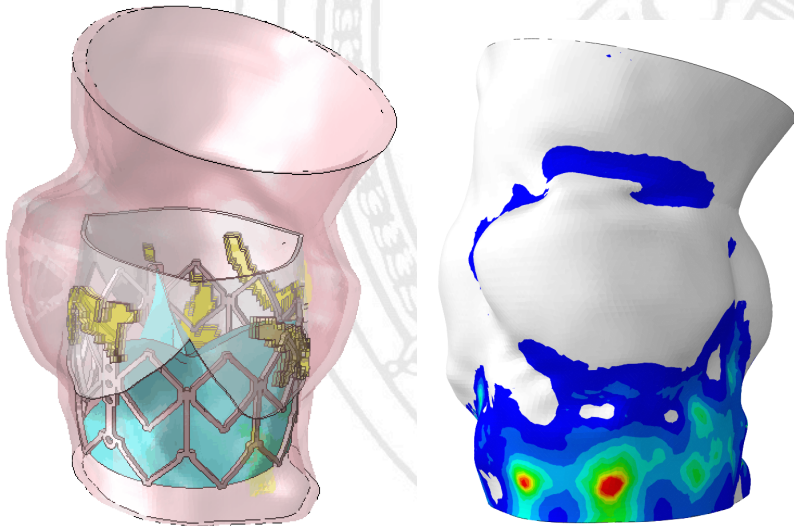

Type: Numerical

Prerequisites:
➢ Good knowledge of Matlab
➢ At least basic knowledge of Abaqus

References:
• F. Auricchio et al., *Simulation of transcatheter aortic valve implantation: a patient-specific finite element approach*, Computer Meth. in Biomech. and Biomed. Eng., 2013.

Key collaborations:
• ICSA Sant'Ambrogio, Milano
• IRCCS Policlinico San Matteo, Pavia

Thesis proposal