

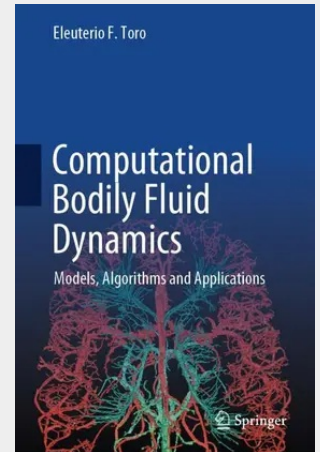
Toro

Computational Bodily Fluid Dynamics

Models, Algorithms and Applications

This book provides fundamental information on all aspects of computational haemodynamics in an integrated manner, combining physiology, fluid mechanics, differential equations and related numerical methods, computing, experiments and cardiovascular pathologies. Further, it demonstrates how to develop mathematical models for blood and other physiological fluids, such as cerebrospinal fluid, all in the context of research on cardiovascular and neurodegenerative diseases. The book is based on two Master's courses and a PhD Winter School course taught at the University of Trento, Italy. Its target audience includes Master's students and PhD researchers in engineering, mathematics, computer science, and medicine, but it will also benefit medical professionals, researchers and academics.

Introduction.- Cardiovascular physiology.- Elementary haemodynamics.- A primer on solid and fluid mechanics.- Mathematical models for blood flow.- Compartmental models.- Properties of averaged 1D models.- Basics of numerical methods.- The exact solution of the Riemann problems for arteries and veins.



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