

SIAM CSE 11

Title: Modeling coupled electromechanics in the cardiovascular system

Abstract:

Computational approaches to mathematically modeling the function of the human heart have increasingly incorporated coupling between the electrical activity that pace the heart and the mechanical activity that drive its pump function. Both cardiac mechanics and cardiac electrophysiology are well-developed computation fields, and bringing them together in a physically relevant and computationally solvable manner presents particular challenges. Active fields of research in this area include the development of multiscale models and the associated computational methods for solving them, as well as the validation and use of such models in biomedical research.

Speakers:

Natalia Trayanova

Title: Electromechanical Models of the Heart

Roy Kerkhoffs

Title: Apex to base heterogeneous electrophysiology in a ventricular dog model of the heart

Samuel Wall

Title: Modeling the infarct injured heart, insights into mechanical dysfunction

Victorien Emile Prot

Title: Finite element analysis of the mitral valve with active muscle fibres