University of Stuttgart
Institute for Modelling and Simulation
of Biomechanical Systems

A continuum model for blood perfusion in skeletal muscles

Master thesis project

Blood perfusion in skeletal muscles ensures oxygen and nutrient supply and thus serves as an essential physiological process to allow the muscle‘s core function: force generation and the creation of movement of the musculoskeletal system. To account for metabolic effects in existing 3D continuum models for the active muscle behaviour, these models can be properly extended by means of the Theory of Porous Media (TPM).

Tasks:

- Formulating a multiphase TPM model for blood perfusion
- Implementation into an FE framework
- Obtaining permeability data from literature
- Simulating examples with realistic muscle geometries

Requirements:

- Basic programming skills (Python)
- Basic knowledge of continuum mechanics
- Basic knowledge of muscle physiology

Language:
English or German

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