Optimal Control Techniques in Hemodynamics

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Resumo/Abstract:
Blood flow simulations can be improved by integrating known data into the numerical simulations. Data Assimilation techniques based on a variational approach play an important role in this issue. We propose a non-linear optimal control problem to reconstruct the blood flow profile from partial observations of known data in different geometries. To simplify, blood flow is assumed to behave as a Navier-Stokes fluid. Using a Discretize then Optimize (DO) approach, we solve a non-linear optimal control problem and present numerical results that indicate its robustness with respect to different idealized geometries and measured data. Blood flow in real vessels will also be considered, including the discussion of a particular clinical case.