

Modeling blood flows in patient-specific arteries

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In this talk we discuss some recent experiences of modeling blood flows in patient-specific arteries. To obtain computational results that are useful for the understanding of certain arterial diseases or for the planning of surgery, the numerical model has to be physically correct, and the simulation has to use the correct computational domain, initial condition, boundary conditions, and material parameters, etc. However, many of these necessary conditions are difficult to measure directly from a particular patient. Fortunately, in some situations machine learning can provide such conditions if there is enough training data. In this presentation, we focus on a class of domain decomposition algorithms for the numerical solution of the governing equations and also for the fast training of deep neural networks.