Talk announcement

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Isogeometric Analysis for non-linear elasticity problems

We consider a non-linear elasticity problem for modelling a human artery. Therefore, we introduce the St. Venant-Kirchhoff material law and the corresponding stored energy function, which is used to define the energy potential of hyperelastic, isotropic materials. Based on the total energy potential, we derive a non-linear weak formulation and briefly mention existence and uniqueness results, mainly based on the theory of polyconvexity. For discretizing and solving our model problem numerically, we use an Isogeometric Analysis (IgA) approach. Motivated by the well-known locking effect, we shortly discuss the advantages and disadvantages of using high order IgA in contrast to high order Finite Element Method (FEM) and present some examples in two and three dimensions. Further, numerical results of those experiments will be provided.