Numerical Analysis and Scientific Computing Seminar

Space-time methods for optimal control models in pedestrian dynamics

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Abstract: The complex behavior of large pedestrian groups has always fascinated researchers from various scientific fields. Starting with empirical observations, its research has continued with the development of different models in the field of applied physics and more recently applied mathematics. In this talk, we focus on optimal control models, which describe the evolution of a large pedestrian group trying to reach a specific target with minimal cost. We discuss different choices of cost functionals and the connection to the Hughes model for pedestrian flow. The proposed space-time method is based on the Benamou and Brenier formulation of optimal transport problems. We present its extension to more general cost functionals and optimal control problems and illustrate the dynamics with numerical simulations.

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