Optimal control models in pedestrian dynamics

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Large pedestrian crowds often exhibit complex dynamics. There is a vast literature on different mathematical approaches ranging from the microscopic description of the individual dynamics to macroscopic equations for the evolution of the crowd. 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 models regarding the cost functionals and PDE-constraints as well as the connection to the Hughes model for pedestrian flow. We propose a space-time method which is based on the Benamou and Brenier formulation of optimal transport problems and illustrate the dynamics with numerical simulations.