

## Optimal control of pedestrian dynamics

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This talk is devoted to optimal control problems for the Hughes model which is a mathematical description of pedestrian dynamics. As an application, we consider the optimal evacuation of a crowd in e. g. a burning building. The typical observation is that all people run to the closest exit and depending on the initial distribution of the crowd some exits slightly further away are not minded. Thus, we modified the model and introduced so-called agents which may also attract the crowd and the aim is to control the movement of these agents such that the evacuation is optimized by evenly spreading the crowd to all exits.

The model is based on a coupled system of a transport equation for the crowd, an Eikonal equation for the potential and an ODE system for the agent dynamics. The problem is discretized with a discontinuous Galerkin scheme. Moreover, we investigate first-order necessary optimality conditions and gradient based optimization methods for the optimal control problem.

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