

27th IFIP TC7 Conference 2015 on System Modelling and Optimization

[Partial Differential Equations in the Modeling of Collective Phenomena]

[Modelling, simulation and optimization on networks]

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**Abstract:** [In this talk we consider several applications on networks within a unified simulation and optimization framework, in particular gas and water supply networks, road traffic and production systems. Based on the underlying macroscopic models, we first apply appropriate discretization schemes to each problem. To solve optimization tasks, we use an SQP solver and compute gradient information with a first-discretize adjoint approach. The latter information can additionally be exploited for error estimation and an adaptive simulation/optimization algorithm. Finally, various numerical results are shown to demonstrate the applicability of the presented framework.]