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Predictive Control of Large Complex Networks ALEKSANDAR HABER, ADILSON E. MOTTER, Northwestern University — Networks of coupled dynamical subsystems are increasingly used to represent complex natural and engineered systems. While recent technological developments give us improved means to actively control the dynamics of individual subsystems in various domains, network control remains a challenging problem due to difficulties imposed by intrinsic nonlinearities, control constraints, and the large-scale nature of the systems. In this talk, we will present a model predictive control approach that is effective while accounting for these realistic properties of complex networks. Our method can systematically identify control interventions that steer the trajectory to a desired state, even in the presence of strong nonlinearities and constraints. Numerical tests show that the method is applicable to a variety of networks, ranging from power grids to chemical reaction systems.

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