1128-93-213 **Krishnamurthy Dvijotham*** (`dvij@cs.washington.edu`), 1850 Stevens Drive Apt 225, Richland, WA 99354. *Robust optimization of infrastructure networks.*

Infrastructure networks like the electric power grid, the gas pipeline network and the water distribution network deliver critical services for a modern economy. However, the steady-state behavior of these networks is described by nonlinear "flow equations" and poses a challenge for optimization and optimal control of these networks. Furthermore, these networks are being subject to ever-increasing sources of uncertainty (intermittent renewable generation in the power grid, increased coupling between the gas and power grid, the water-energy nexus etc.) and the traditional operating paradigms are insufficient to deal with the uncertainty while still ensuring optimal utilization of network resources. We present a new framework to construct convex inner approximations of the nonconvex feasible sets defined by the nonlinear flow equations and use these to compute robust-feasible solutions to the nonlinear systems. We further identify special cases when the robust nonconvex optimization problems can be solved to global optimality using convex relaxations. Finally, we present numerical results validating our approach. (Received February 27, 2017)