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## A scale-free small-gain theorem for hyper-connected networks

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### Abstract

Emerging technologies such as the Internet of Things, Clouds, 5G, etc. are expected to generate a paradigm shift towards a hyper-connected world composed of a large number of smart networked systems. An underlying aspect of such networked systems is to be large, time-varying and often unknown in size. Existing tools for controller synthesis, however, do not scale to such increasingly common networked systems. In this talk, we provide a promising solution to the scalability issues by over-approximating a large-but-finite network with an infinite network and developing a small-gain theorem which is independent of the size of the network. An application of our result to traffic networks together with several outlooks of our work will be discussed.

### Biography

Dr. Navid Noroozi received his M.Sc. and Ph.D. degrees in Electrical Engineering from Shiraz University, Shiraz, Iran, in 2009 and 2014, respectively. From August 2012 to February 2013, he was a visiting scholar at the Electrical and Electronic Engineering Department of the University of Melbourne, Melbourne, Australia. Dr. Noroozi joined the Electrical Engineering Department of Sheikh Bahaei University, Iran, in August 2014, where he was an Assistant Professor until August 2016. From August 2016 to October 2018 he was a Humboldt Research Fellow (Humboldt-Forschungsstipendiat) at the Dynamical Systems Chair of Passau University, Germany. Since November 2018 Dr. Noroozi has been a Scientific Associate at the Institute for Automation Engineering (IFAT), Otto-von-Guericke University Magdeburg.