



Anders Rantzer

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Title: Distributed Control Using Positive Quadratic Programming

Biography

Anders Rantzer was born in 1963. He received a Ph.D. degree in optimization and systems theory from the Royal Institute of Technology (KTH), Stockholm, Sweden. After postdoctoral positions at KTH and at IMA, University of Minnesota, USA, he joined the Department of Automatic Control at Lund University in Sweden 1993. He was appointed professor of Automatic Control in Lund 1999. The academic year of 2004/05 he was visiting associate faculty member at California Institute of Technology in USA.

Rantzer has been serving as associate editor of IEEE Transactions on Automatic Control and several other journals. He is a winner of the SIAM Student Paper Competition, the IFAC Congress Young Author Prize and the IET Premium Award for the best article in IEE Proceedings – Control Theory & Applications during 2006. He is a Fellow of IEEE and a member of the Royal Swedish Academy of Engineering Sciences.

His research interests are in modeling, analysis and synthesis of control systems, with particular attention to uncertainty, optimization and distributed control.

Abstract

State space descriptions with nonnegative coefficients define an important class of dynamical systems, so-called positive systems, with many applications in science and technology. In particular, they appear naturally in the study of electrical power systems.

Positive systems have properties that are particularly attractive for distributed control. For example, they allow stability to be verified without conservatism in a distributed way. Moreover, optimal controllers with constraints can be designed using Positive Quadratic Programming. This is a generalization of standard quadratic programming, which exploits positivity of coefficients in objective function and constraints. The technique will be illustrated by examples from electrical networks.