学术报告会

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Multi-objective Complementary Control

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摘要:

In this talk, a new design paradigm for multi-objective complementary control is presented. This new framework allows arbitrary designs of two independent control and utilizes Youla-Kucera parameterization for all stabilizing controls to assemble two controllers together by constructing a specific parameter. The complementary control can then be realized through nature transition as modulated by the output signal of the Youla parameter. Various simplified structures are discussed as derived from this framework. A robust tracking control is present as an application of this framework and analysis of control performance are discussed. This new framework is a ground breakthrough in contrast with traditionalcontrol design.

简介:

Xiang Chen received Ph. D. degree in system and control from Louisiana State University in 1998.He held cross-appointed positions in Department of Electrical and Computer Engineering and Department of Mechanical, Automotive and Materials Engineering at the University of Windsor, Canada, and is currently a Professor in the Department of Electrical and Computer Engineering. He has made fundamental contribution to $\mathcal{H}_\infty$ Gaussian filtering and control, control of nonlinear systems with bifurcation, networked control system, and optimization of field sensing networks.He has also made significant contribution to applications of control and optimization in automotive and manufacturing systems, through extensive research and development collaboration with automotive, robotics, and manufacturing industries. Some of the deliverables have been transferred into product lines of relevant companies. He served Senior Editor and Technical Editor for the IEEE/ASME Transactions on Mechatronics (TMECH) and serves Associate Editors for SIAM Journal on Control and Optimization, IEEE Transactions on Automatic Control, International Journal of Intelligent Robotics and Applications, Control Theory and Technology (English Version), and Unmanned Systems. His current research interests include multi-objective complementary optimization and control of systems with complexities, optimization of field perception and sensing networks and field sensor guided autonomous operations, as well as control applications to automotive systems, manufacturing systems, and autonomous vehicles. He is a registered Professional Engineer in Ontario, Canada.