

ELECTRICAL & COMPUTER ENGINEERING SEMINAR

“Congestion Control Over Satellite Networks Via Safe Switching Adaptive Algorithms”

by

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LSC Room 220**

Abstract & Biography

Abstract: Control of uncertain systems under as few prior assumptions as possible has long been one of the central research interests in the control community. Data-based adaptive methods for assuring stability and performance of operation using switching among multiple models and/or controllers have recently been in the focus of this attention. Satellite clusters, as examples of large-scale, long fat networks subject to varying degrees of uncertainty, are good examples for testing robustness improvement achievable using switching control. Satellite networks play an important role in broadcasting data over large geographic locations and reaching remote locations lacking in communication infrastructure, so an uninterrupted operation of their data flow is the utmost importance.

I will discuss the theoretical issues related to the adaptive control of uncertain systems using data-driven cost functionals, then proceed to present the results of the safe switched data congestion control algorithm for assuring stability and performance of the satellite TCP/AQM networks. Additional structure can be imposed on the candidate controllers or cost function to improve the transient behavior of the system output variables in-between switches. A comparison with some popular, currently existing schemes for the control of the buffer queue rate will be discussed.

Time permitting, I will briefly review a related topic, our new optimal routing system for the LEO satellite networks based on the cross entropy and ant routing scheme. A few examples of the simulation studies of an iridium-like satellite network will be discussed. These results show significant improvement of the convergence speed for achieving optimal or suboptimal paths.

Biography: Dr. Stefanovic is an Assistant Professor in the Electrical and Computer Engineering Department at the University of Wyoming. She received her PhD and MSEE from the University of Southern California in 2005 and 2002, and a Dipl.-Ing. degree in Electrical Engineering from the University of Nis, Yugoslavia in 1996. Her current research interests are in control systems theory (robust switching adaptive control) and applications (network control, routing, modeling and control of biological oscillators, intelligent highway systems).

Please contact Professor Anura Jayasumana, Anura.Jayasumana@Colostate.edu, with any questions.