Inquiry: Jie Chen (jichen@cityu.edu.hk)

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**Jointly present**

**SEMINAR SERIES ON CHAOS, CONTROL AND COMPLEX NETWORKS**

**Some Remarks on the Control of Single-Input LTI Systems over Erasure Channels**

**Dr. Eduardo I. Silva**
Departamento de Electronica
Universidad Tecnica Federico Santa Maria
Casilla 110-V, Valparaiso, Chile

**Date and Time:** Thursday, 20 October 2011, 4:00 – 5:00 pm
**Venue:** Room G6302, Academic 1 Building, City University of Hong Kong
Reception starts at 3:45 pm
(Language: **English**)

**Abstract**

This talk will present results pertaining networked control problems for single-input linear time-invariant (LTI) plants. Our focus is on two types of channels with feedback: analog erasure channels subject to input power constraints, and digital erasure channels. Building upon recent results, we show that it is possible to convert analysis and design problems involving such channels into problems involving two signal-to-noise ratio constrained channels in series. This insight is then used to establish sufficient (and in the case of analog erasure channels also necessary) conditions on the channel parameters that allow one to achieve mean square stability, while respecting the communication constraints. We also consider control problems beyond stabilization. In the case of power constrained erasure channels, we show that optimal controller design problems can be solved by using a (non-iterative) two step design procedure, where the effects of communication constraints appear explicitly as a weighting factor in a standard optimal control problem. This fact allows us to provide a closed form expression for the detrimental effects of communication constraints on closed loop performance. In the case of digital erasure channels, our results provide an upper bound on the achievable performance. Directions for future research will also be discussed.

**About the speaker:**

Dr. Eduardo I. Silva received the Ingeniero Civil Electrónico degree and the M.Sc. degree in electronics engineering from the Universidad Técnica Federico Santa Maria, Valparaiso, Chile, in 2004. In 2009 he received the Ph.D. degree from The University of Newcastle, NSW, Australia. He is currently a Research Academic with the Electronics Engineering Department, Universidad Técnica Federico Santa Maria. His research interests include multivariate control systems, performance limitations, decentralized control, networked control, and signal processing. He has coauthored more than 50 journal and conference papers and contributed one book chapter.