CONFERENCIA INVITADA

Fecha: 27 de Junio
Hora : 15:30 - 16:30
Lugar: Salón de grados del Departamental I. Campus de Fuenlabrada.

TÍTULO: SOI-KF: Distributed Kalman Filtering with Low-Cost Communications using the Sign Of Innovations

ABSTRACT:
When dealing with decentralized estimation, it is important to reduce the cost of communicating the distributed observations -- a problem receiving revived interest in the context of wireless sensor networks. In this paper, we derive and analyze distributed state estimators of dynamical stochastic processes, whereby the low communication cost is effected by requiring the transmission of a single bit per observation. Following a Kalman filtering (KF) approach, we develop recursive algorithms for distributed state estimation based on the sign of innovations (SOI). Even though SOI-KF can afford minimal communication overhead, we prove that in terms of performance and complexity it comes very close to the clairvoyant KF which is based on the analog-amplitude observations. Reinforcing our conclusions, we show that the SOI-KF applied to distributed target tracking based on distance-only observations yields accurate estimates at low communication cost.

BIO:
Alejandro Ribeiro received his B.Sc. degree in Electrical Engineering from Universidad de la Republica Oriental del Uruguay, Montevideo, Uruguay in 1998. From 1998 to 2003 he was a member of the Technical Staff at Bellsouth Montevideo. Since May 2003 he has been working towards his Ph.D. degree in the Department of Electrical and Computer Engineering, University of Minnesota, Minneapolis, MN where he received his M.Sc. degree in Electrical Engineering in 2005. His research interests lie in the areas of communication theory, signal processing and networking. His current research focuses on wireless cooperative communications, random access, wireless ad-hoc and sensor networks, and distributed signal processing. Mr. Ribeiro is the recipient of the 2005 and 2006 ICASSP student paper awards and a Fulbright Scholar.