

Seminario conjunto CMM-IDIA

Speaker: Leszek Szczecinski, University of Quebec, Canadá.

Title: Simplified Kalman filtering for non-linear models.

Abstract: We will discuss the problem of approximate statistical inference in the hidden Markov models where the observation equations are non-linear. We propose a Bayesian approach based on a Gaussian approximation as well as its versions suitable for "large" problems. The proposed approach may be seen as an approximate Kalman filter which is generic in the sense that it can be used for any non-linear relationship between the hidden state and the outcome. We show how the proposed simplified Kalman filter can be used in the context of sport rating where the skills of the players/teams are inferred from the observed outcomes of the games. We show how the well-known algorithms (such as the Elo, the Glicko, and the TrueSkill algorithms) may be seen as instances of the approach we develop. In order to clarify the conditions under which the gains of the Bayesian approach over the simpler solutions can actually materialize, we critically compare the known and the new algorithms by means of numerical examples using synthetic as well as empirical data.

Bio: Leszek Szczecinski is Professor at INRS, University of Quebec, Canada. He obtained M.Eng. degree from the Warsaw University of Technology in 1992, and Ph.D. from INRS-Telecommunications, Montreal in 1997. From 1998 to 2001, he held position of Assistant Professor at the Department of Electrical Engineering, University of Chile. In 2009-2010, as a Marie Curie Research Fellow, he was with CNRS, L2S, Gif-sur-Yvette, France. His research interests are in the area of mathematical modelling, estimation, signal processing, and communication theory. He coauthors a book "Bit-Interleaved Coded Modulation: Fundamental, Analysis and Design" (Wiley, 2015).

Lunes 09 de Enero 2023 a las 16:00 hrs.

Sala de Seminarios John Von Neumann CMM, Beauchef 851, Torre Norte, Piso 7.

