

講演会

日時：2018年10月1日 10:30 - 12:00

場所：早稲田大学理工学術院 63号館1階、数学・応数会議室

(アクセス：早稲田大学 西早稲田キャンパス > 63号館)

(Access: Waseda University Nishi-Waseda Campus > Bldg. No.63)

(早稲田理工学術院談話会および基盤研究(S)(代表：谷口正信)「広汎な観測に対する因果性の導入とその最適統計推測論の革新」による)

講演者：Professor Hans R. Künsch, ETH Zurich, Switzerland

講演題目： Estimation of fixed parameters in state space models:
Computation, Asymptotics and Robustness

Abstract : A state-space model consists of a latent state process (X_t) with a Markovian dynamics and a sequence of independent partial and noisy observations Y_t of X_t . Such models are used in many applications, e.g. ecology, finance or engineering. In this talk I discuss the estimation of unknown parameters in the transition density of (X_t) and in the conditional density of Y_t given X_t . The joint density of states and observation is known explicitly, but the marginal density of observations alone is in general not tractable. In the first part, I discuss three methods to approximate the MLE: The stochastic EM-algorithm, particle Markov chain Monte Carlo and Laplace approximations combined with automatic differentiation. In the second part, I consider a robustified likelihood which reduces the contribution of states and observations with low likelihood. An additional complication of this robustified likelihood and its score equation is the bias that has to be corrected. In the third part, I outline the consistency proof of this robust estimator and the definition and computation of the influence functional of Martin and Yohai (1986). The method is illustrated with data assessing the abundance of North Sea pollock.

This is joint work with William Aeberhard, Eva Cantoni, Chris Field, Joanna Fleming and Ximin Xu.