ALPEN-ADRIA UNIVERSITÄT KLAGENFURT

Invitation to the Doctoral Seminar

Dr. Lassi Roininen
Technische Universität Lappeenranta

"Uncertainty quantification for Bayesian large-scale inverse problems"

N.2.35 Wednesday, 21 February 2024 11:00 a.m.

Abstract

Large-scale inverse problems appear in problems such as computed tomography and satellite remote sensing, where parameter space tends to be of the order of 10´6, or larger. Inverse problems are characterised by ill-posed forward operator and noisy measurements. These problems can be solved within Bayesian inversion framework where the stabilisation of the solution, that is the posterior distribution, is done by imposing a prior distribution. We consider certain examples of such priors constructed via Gaussian and non-Gaussian Markov random fields and mixtures of Gaussian process experts. For drawing estimators from these distributions, we need efficient optimisation algorithms, and Markov chain Monte Carlo and sequential Monte Carlo methods. Finally we show some numerical examples in tomographic imaging with applications in industry and space weather.

Barbara Kaltenbacher and the Department of Statistics look forward to seeing you at the talk!