



Analysis Seminar

Title: A parametric approach to the estimation of risk functionals based on Wasserstein distance

Speaker: Alessandro Sgarabottolo (Universität Bielefeld)

Date: Wed 7th December 2022 at 11:00AM

Location: Seminar Room SCN 1.25

Abstract: We explore a static setting for the assessment of risk in mathematical finance and actuarial science that takes into account model uncertainty in the distribution of a risk factor. We allow for perturbations around a baseline model, measured via Wasserstein distances, and we show how this form of probabilistic imprecision can be parametrized. This leads to a convex risk functional which incorporates a safety margin with respect to nonparametric uncertainty and still can be approximated through parametrized models. The particular form of parametrization allows us to develop a numerical scheme, based on neural networks, which gives both the value of the risk functional and the optimal perturbation of the reference measure. We also study the problem under two constraints on the perturbed models, namely, a mean and a martingale constraint. We show that, in both cases, under suitable conditions on the loss function, it's still possible to estimate the risk functional by a parametrization of the perturbed models, which again allows for a numerical approximation via neural networks. The talk is based on joint work with Max Nendel.

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