ALPEN-ADRIA UNIVERSITÄT KLAGENFURT

Invitation to the Doctoral Seminar

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"Distance between stochastic differential equations: a discretisation approach"

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Abstract

Stochastic differential equations (SDEs) are used to model many phenomena that exhibit randomness. It is important to quantify the uncertainty in the choice of model and the sensitivity of certain values to changes in the model. In order to do this, we seek an appropriate notion of distance between SDEs, or more precisely between the probability measures that they induce. A natural notion of distance between probability measures is the Wasserstein distance arising from optimal transport. However, this distance fails to take into account the flow of information in stochastic processes. In this talk I will introduce the adapted Wasserstein distance, which does encodes this information flow. For a large class of SDEs, we find a coupling that attains the adapted Wasserstein distance between their laws. The methods are based on carefully chosen discretisation schemes for the SDEs. In this way, we find a continuous-time analogue of the celebrated Knothe—Rosenblatt rearrangement. This is based on joint works with Julio Backhoff-Veraguas (Universität Wien) and Sigrid Källblad (KTH Stockholm), and with Michaela

Szölgyenyi (Universität Klagenfurt).

Michaela Hitz and the Department of Statistics look forward to seeing you at the talk!