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FAKULTÄT FÜR MATHEMATIK
Dekan Univ.-Prof. Dr. Christian Krattenthaler

Einladung zur öffentlichen Defensio von

Anastasiia Zalashko

Thema der Dissertation:

Causal optimal transport: theory and applications

Abstract:
This thesis studies the causal optimal transport problem between laws of stochastic processes. Causality here means to add a physically relevant time constraint into the classical optimal transport problem restricting the admissible set of transport plans to those that perform the allocation of mass in an adapted (nonanticipative) way. Intuitively, one can say that the relationship between causal plans and adapted processes is the same as that between transport plans (Kantorovich) and classical transport maps (Monge). The main aim of the thesis is to show the full theoretical potential and the modelling power of causal optimal transport problems by analysing their structure and by highlighting their significant features frst in discrete time, with further extension to continuous time. Questions as duality, characteriza- tion of optimizers, and a connection between transport-information inequalities and stochastic optimization are discussed. Varying the underlying filtrations in the definition of causality allowed to provide a novel point of view on various problems related to enlargement of filtrations and Girsanov theory in stochastic analysis.

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