Einladung

zum Vortrag im Rahmen des **SFB Colloquiums** (Standort Graz), mit dem Titel

Approximation rate for Forward-backward SDEs using a simple random walk

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ORT: KFU Graz

Abstract: For the FBSDE

$$X_t = x + \int_0^t b(r, X_r)dr + \int_0^t \sigma(r, X_r)dB_r$$

$$Y_t = g(X_T) + \int_t^T f(s, X_s, Y_s, Z_s)ds - \int_t^T Z_s dB_s, \quad 0 \le t \le T$$

Briand, Delyon and Memin have shown in [1] a Donsker-type theorem: If one approximates the Brownian motion B by a random walk B^n, the according solutions (X^n, Y^n, Z^n) converge weakly to (X, Y, Z).

If the random walk is constructed from the underlying Brownian motion, (Y_t^n, Z_t^n) converges to (Y_t, Z_t) in L_2. We prove the rate of convergence in dependence of the Hölder continuity of the terminal condition function g and provide some simulations. The proof relies on an approximative representation of Z^n and uses properties of the PDE associated to the FBSDE, and the concept of discretized Malliavin calculus considered in [2].

This is joint work with Céline Labart (Université de Savoie, France) and Antti Luoto (University of Jyväskylä, Finland).

[1] P. Briand, B. Delyon, J. Memin, *Donsker-Type theorem for BSDEs.* Electron. Comm. Probab. 6, 1 – 14 (2001).
[2] C. Bender, P: Parczewski, *Discretizing Malliavin calculus.* Stoch. Proc. Appl. (2017)

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