

Nacira Agram

Title: Mean-field BSDEs and their applications

Abstract: We prove existence and uniqueness of solution of mean-field backward stochastic differential equations (MF-BSDEs) under some conditions. We prove a comparison theorem for a subclass of these equations. Then we specialise to the linear case, and give an explicit formula for the first component of a general linear MF-BSDE. As an illustration we apply the results to study a mean-field recursive utility maximisation problem under model uncertainty.

Bernardo D'auria

Title: Optimal strategies with inside information on the stochastic interest rate

Abstract: We discuss how to apply enlargement of filtration techniques to compute the optimal portfolio strategy for an agent that knows future information on the terminal value of the interest rate processes. After discussing a general model for the interest rate process, we will focus on the Vasicek model that assumes an Ornstein–Uhlenbeck process. We show that, depending on the detail of the information own by the agent, the value of the portfolio may be infinite or finite.

Fabian Andsem Harang

Title: Girsanov theorem for Multifractional processes

Abstract: In this talk I will present a new perspective on the variable order fractional calculus, which allows for differentiation and integration to a variable order, i.e. one differentiates (or integrates) a function along the path of a regularity function. I will show how to construct a multifractional derivative operator which acts as the inverse of the multifractional integral operator. This is done by solving the Abel integral equation generalized to a multifractional order. The derivative operator will then be applied to give strong solutions of SDE's driven by non-stationary Multifractional Processes with drift coefficients of only linear growth.

This work is done in collaboration with Torstein Nilssen, and Frank Proske, see arxiv:

<https://arxiv.org/abs/1706.07387>

Tore Selland Kleppe

Title: Stochastic Volatility and Jumps in Commodity Market Futures Term Structures

Abstract: The Schwartz (J. Finance 1997) model for commodity market futures is augmented with stochastic volatility (SV) and jumps. By specifying the volatility process as a CIR process, we retain an affine jump-diffusion structure and in particular closed form expressions for the future log-prices that is linear in terms of the latent state processes. An efficient Bayesian estimation strategy based on a collapsed Gibbs sampler and Particle Gibbs is proposed. For daily data on crude oil, cotton and copper,

it is found that the inclusion of SV substantially improves in-sample performance (measured using model evidence), whereas the inclusion of jumps in the convenience yield has a smaller impact. In the out-of-sample evaluation, SV produces improved pricing performance for crude oil, whereas the effect is smaller for cotton and copper.

Annika Lang

Title: Random field simulation: bridging stochastic processes and their applications

Abstract: Models in natural sciences, engineering, and finance include in recent years more and more random components. Solving these models and drawing conclusions often requires simulation and knowledge of analytical properties. I will use the example of random field simulation to show how applications lead to interesting mathematical questions and how to transfer analytical results back to the original problems.

Frank Norbert Proske

Title: Strong solutions of SDE's with generalized drift and multidimensional fractional Brownian initial noise

Abstract: In this paper we prove the existence of strong solutions to a SDE with a generalized drift driven by a multidimensional fractional Brownian motion for small Hurst parameters $H < 1/2$. Here the generalized drift is given as the local time of the unknown solution process, which can be considered an extension of the concept of a skew Brownian motion to the case of fractional Brownian motion. Our approach for the construction of strong solutions is new and relies on techniques from Malliavin calculus combined with a "local time variational calculus" argument.

Kerem Ugurlu

Title: Robust Merton problem with nondominated priors

Abstract: We give explicit solutions for utility optimization problems in the presence of Knightian uncertainty in continuous time. We solve the robust optimization problem explicitly both when the investor's utility is of CRRA and of CARA type. We show that our problem formulation allows us to apply Sion's min-max theorem. We further discuss extensions of our model to a jump diffusion framework.

Yinzhi Wang

Title: Model selection methods for non-life insurance claim severity distributions

Abstract: In non-life insurance, the identification of the relevant distributions for both the claim

frequency and claim severity process from given data is of major importance. There is a vast literature with aim of finding models to deal with all data features with model selection techniques. The question is whether the stochastic models and model selection methods that are optimal for large sample sizes are also optimal when data is limited. Moreover, computing solvency capital or claim reserve (i.e., a quantile far out in the tail of the distribution of total insurance loss) is one of the core themes within non-life insurance. Thus, choosing a suitable claim severity distribution is essential since it to a great extent controls how heavy-tailed the total loss distribution is. In this paper we employ the focused information criterion (FIC) which considers a parameter of interest and attempts to select the model performing the best at estimating this particular parameter. An extensive simulation study is conducted to compare FIC to other selection methods, such as other information criteria (AIC, BIC) and goodness-of-fit tests as the sample size and the claim severity distribution vary, when the claim reserve is the focus and the claim frequency distribution is fixed.