

January 29th, 2018

KAP 414

2:00 P.M. – 3:00 P.M.

Professor Ruimeng Hu

(University of California, Santa Barbara)

“Portfolio Optimization Under Fractional Stochastic Environments”

Abstract: Rough stochastic volatility models have attracted a lot of attention recently, in particular for the linear option pricing problem. In this talk, I will start with power utilities, and propose to use a martingale distortion representation of the optimal value function for the nonlinear asset allocation problem in a (non-Markovian) fractional stochastic environment (for all Hurst index $H \in (0, 1)$). A first-order approximation of the optimal value is rigorously established, where the return and volatility of the underlying asset are functions of a stationary slowly varying fractional Ornstein-Uhlenbeck process. We prove that this approximation can be also generated by a fixed zeroth order trading strategy providing an explicit strategy which is asymptotically optimal in all admissible controls. Similar results are also obtained under fast mean-reverting fractional stochastic environment. Furthermore, we extend the discussion to general utility functions, and obtain the asymptotic optimality of this fixed strategy in a specific family of admissible strategies.