

Talk 1: Monday, March 23.

Title: Filtering with Point Process Observations

Abstract: Traditional continuous-time stochastic filtering theory is concerned with diffusion observations. The problem of filtering based on marked point processes is also interesting and often comes up applications. For instance, the central bank filters economy state from discrete economic events such as announced lay-offs; market-makers filter order book trades to infer market liquidity state. In this expository talk I will present an introduction to filtering with point processes, especially in the model of Markov-modulated compound Poisson processes. This is a summary of classical results of Bremaud, as well as recent developments by Dayanik, Sezer, Bayraktar, myself and others.

Talk 2: Wednesday, March 25

Title: Optimal Trade Execution in Illiquid Markets

Abstract: We study optimal trade execution strategies in financial markets with discrete order flow. The agent has a finite liquidation horizon and must minimize price impact given a random number of incoming trade counterparties. Assuming that the order flow N is given by a Poisson process, we give a full analysis of the properties and computation of the optimal dynamic execution strategy. Extensions, whereby (a) N is a fully-observed regime-switching Poisson process; and (b) N is a Markov-modulated compound Poisson process driven by a hidden Markov chain, are also considered. We derive and compare the properties of the three cases and illustrate our results with computational examples.