Forschungsgruppe Finanz- und Versicherungsmathematik
TUM School of Computation, Information and Technology
Technische Universität München

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Announcement Winter Term 2023/24
Advanced Seminar

Filtering Theory & Optimal Investment with Partial Information

Prof. Dr. Christoph Knochenhauer, Prof. Dr. Aleksey Min

Area/ Module ID:	Mathematical Finance/ MA6015
Content:	In many fields of applications one faces the problem of filtering the true state of a system out of a noisy signal. A typical example is the problem of parameter estimation for financial models, in which one tries to determine the drift or volatility of an asset price by only observing the price process. In this seminar, we first discuss this filtering problem from a theoretical point of view before studying several applications arising in mathematical finance in the context of optimal portfolio choice in models with partially observable price processes.
Audience:	Max. 10 M.Sc. students.
Prerequisite:	MA3408 (Financial Mathematics 2) or equivalent.
Literature:	**Elliott, Aggoun, Moore (2008):** Hidden Markov Models **Cohen, Elliott (2015):** Stochastic Calculus and Applications **Dembo, Zeitouni (1986):** Parameter Estimation of Partially Observed Continuous Time Stochastic Processes via the EM Algorithm **Allan, Cohen (2019):** Parameter Uncertainty in the Kalman-Bucy Filter **Krishnamurthy, Leoff, Sass (2018):** Filterbased Stochastic Volatility in Continuous-Time Hidden Markov Models **Bäuerle, Rieder (2005):** Portfolio Optimization with Unobservable Markov-Modulated Drift Process **Brendle (2005):** Portfolio Selection under Incomplete Information **Sass, Westphal, Wunderlich (2017):** Expert Opinions and Logarithmic Utility Maximization for Multivariate Stock Returns with Gaussian Drift **Bandini, Cosso, Fuhrman, Pham (2019):** Randomized filtering and Bellman equation in Wasserstein space for partial observation control problem
Certificate:	Presentation, 3 CP
Lecture/Exercises:	see TUMonline/Moodle