STEVENS
Institute of Technology

Topics in Financial Mathematics

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Stochastic Programming Models in Finance

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3:30 pm
Pierce 218

Abstract: One model is associated with choosing an adaptive strategy for portfolio selection that maximizes the expected utility and is robust in the presence of uncertainty over multiple periods of time. A stochastic optimization model is formulated which has as basic input the random returns of the considered financial instruments. Stochastic models of those instruments are developed on the basis of statistical information. They are used to construct a 'scenario tree'. The scenario tree is the basic input into a deterministic equivalent of the stochastic optimization model called the multi-stage stochastic optimization problem. The latter is solved by special decomposition techniques. The solution is the desired strategy.

Another model is associated with risk management. Investment problems of a given financial system are considered subject to several risk limitations, that is, the value at risk for several risk levels has to be within prescribed bounds. These problems lead to optimization models involving one or more constraints on the probability distribution function of the losses, or of the available cash balance of the financial system over a certain time horizon.

These models are basic stochastic programming models occurring in many other practical applications in telecommunications, network design, etc.

Coffee and refreshments will be served at 3:00pm.

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