Dipartimento di Scienze Matematiche
Politecnico di Torino

Colloquium

Il giorno giovedì 1 marzo, alle ore 14.30 in Aula Buzano, il Professor

Giorgio Consigli

dell'Università di Bergamo, terrà la conferenza dal titolo

An application of stochastic optimization methods
to optimal individual asset–liability management

Abstract. The formulation of an optimal individual financial planning problem and its solution have represented one of the most challenging research areas in financial economics at least since the 1968 seminal article by the Nobel laureate Paul Samuelson on the optimal lifetime investment-consumption problem in a continuous time framework. From a mathematical viewpoint, this is a complex dynamic optimization problem, whose formulation requires:

- the introduction of a possibly nonlinear objective function to capture individuals' risk preferences,

- the generation of long term financial scenarios to describe the random evolution of individual consumptions and investment choices,

- the introduction of a possibly time dependent constraint region binding individual strategies.

We present in the paper a discrete time and discrete state representation of the optimal individual planning problem spanning the entire working life of a young individual. The problem is formulated and solved as a multistage stochastic programme. The key steps from the definition of the underlying stochastic model to the numerical solution of the associated large scale program are analyzed and their underlying theoretical implications considered. Multistage stochastic programming is emerging as a natural mathematical framework to formulate and solve large scale stochastic programs in several application areas, including the financial and energy sectors, telecommunications, supply chain management and logistics. Results from numerical analysis, stochastic processes and probability theory as well from operations research and finance all converge to this naturally multidisciplinary field increasingly adopted in real world application domains.