Abstracts

Reinforcement learning and portfolio management: overview, open problems and possible solutions

HAORAN WANG

Columbia University, USA

ABSTRACT

Reinforcement learning (RL) has been extensively studied in non-finance related domains (e.g., AlphaGO, self-driving, etc). For financial applications, such as risk-sensitive portfolio management, there are additional challenges that remain to be addressed. In this tutorial, we will first review the basic building blocks of RL algorithms. Following that, we further discuss several types of portfolio management problems that could be potentially solved by RL, including the mean-variance problem and its variants. The proposed solitons are motivated by stochastic control techniques in both continuos and discrete time.

Computational issues of dynamic programming and reinforcement learning

Nan Chen

The Chinese University of Hong Kong, Hong Kong

ABSTRACT

In this tutorial, I plan to cover the following topics related to stochastic dynamic programming and its computation.

1. Formulation

2. Basic idea of approximate dynamic programming and Q-learning

3. Approximating value functions: regression and neural network

4. Exploration vs. exploitation

5. Duality on SDP

Some financial examples will also be discussed.

The first and second fundamental theorem of quantitative risk management

PAUL EMBRECHTS

ETH Zürich, Switzerland

ABSTRACT

I very much hope that participants to this 4-hour tutorial will think beforehand what their candidates for a First and Second FT of QRM would/could be. Rather than lifting the "veil of secrecy" at this point, I can say so much as that I will guide the participants through some key results of the book: "A.J. McNeil, R. Frey and P. Embrechts (2015) Quantitative Risk Management: Concepts, Techniques and Tools. Princeton University Press", see also www.qrmtutorial.org for an accompanying website. For this tutorial, I more specifically think of "a methodological excursion through the land of risk management while keeping practical relevance always in sight".