

Backward Stochastic Differential Equations, PDEs and Deep Neural Networks

DI Stefan Kremsner

Abstract:

Backward stochastic differential equations (BSDEs) arise in finance, stochastic control, nonlinear conditional expectation and various other fields. After a short introduction, we will discuss existence and uniqueness of solutions to such BSDEs. We will connect BSDEs to parabolic and elliptic PDEs through a correspondence due to the Feynman-Kac formula. Finally, we will discuss how to solve BSDEs numerically and present a neat approach using deep neural networks.