Well-posedness of mean-field type forward-backward stochastic differential equations

Alain Bensoussan, Phillip Yam and Zheng Zhang[*]

Department of Statistics, The Chinese University of Hong Kong

Abstract

Being motivated by a recent pioneer work Carmona, in this talk, we propose a broad class of natural monotonicity conditions under which the unique existence of the solutions to Mean-field type (MFT) forward-backward stochastic differential equations (FBSDE) can be established. Our conditions provided here are consistent with those normally adopted in the traditional FBSDE (without the interference of a mean-field) frameworks, and give a generic explanation on the unique existence of solutions to common MFT-FBSDEs, such as those in the linear-quadratic setting; besides, the conditions are 'optimal' in a certain sense that can elaborate on how their counter-example in Carmona (2013) just fails to ensure its well-posedness. Finally, a comparison theorem is also included.