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Shige Peng has received his PhD in 1985 at University Paris-Dauphine, in the direction of mathematics and informatics, and 1986 at University de Marseille, in the direction of applied mathematics. He jointed Institute of Mathematics of Fudan University (Shanghai) as a two-year post-doc position during1997-1999. He then come back his homeland Jinan as assistant associated professor in 1990 and full professor 1991. His main researches are in the domains of stochastic optimal controls, backward stochastic differential equations and the corresponding partial differential equations, stochastic HJB equations. Recently he is interested in the theoretical foundation of nonlinear expectations.

Some awards he has received are, the natural Science Prize of China (1995), Su Buqing Prize of Applied Mathematics (2006), Chinese Academy of Science TAN Kah Kee Science Award (2008), Chinese Society of Mathematics Hua Loo-Keng Award (2011), and the Qiu Shi Award for Outstanding Scientists (2016). He was a plenary speaker at the ICM 2010 and ICIAM 2015.

Title: Theoretical study of nonlinear expectations and applications to data sequences with essential uncertainty of probability distributions

Abstract: How to calculate the essential uncertainty of probability distributions hidden behind a real data sequence is a theoretically and practically important challenging problem.

Recently some fundamentally important progresses have been achieved in the domain of law of large numbers (LLN) and central limit theorem (CLT) with a much weaker assumption of independence and identical distribution (i.i.d.) under a sublinear expectation.

These new LLN and CTL can be applied to a significantly wide classes of data sequence to construct the corresponding optimal estimators. In particular, many distribution uncertainties hidden behind data sequences are able to be quantitatively calculated by introducing a new algorithm of phi-max-mean type.

In this talk, I take some typical examples to provide a more concrete explanation of the above mentioned LLN and CLT, the key idea of their proofs, as well as the new phi-max-mean estimators.