Generalised Theory on Asymptotic Stability and Boundedness of Stochastic Functional Differential Equations

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School of Physical and Mathematical Sciences

Asymptotic stability and boundedness have been two of most popular topics in the study of stochastic functional differential equations (SFDEs). In general, the existing results on asymptotic stability and boundedness of SFDEs require (i) the coefficients of the SFDEs obey the local Lipschitz condition and the linear growth condition; (ii) the diffusion operator of the SFDEs acting on a $C^2$-function be bounded by a polynomial with the same order as the $C^2$-function.

However, there are many SFDEs which do not obey the linear growth condition. Moreover, for such highly nonlinear SFDEs, the diffusion operator acting on a $C^2$-function is generally bounded by a polynomial with a higher order than the $C^2$-function. Hence the existing criteria on stability and boundedness for SFDEs are not applicable and we see the necessity to develop new criteria. Our main aim of this paper is to establish new criteria where the linear growth condition is no longer needed while the up-bound for the diffusion operator may take a much more general form.

Speaker Biography
Professor Xuerong Mao is a Fellow of the Royal Society of Edinburgh (FRSE) and the Head of Department of Mathematics and Statistics at Strathclyde University, UK. He received the Ph.D. degree from Warwick University, England in 1989 and was then SERC (Science and Engineering Research Council, UK) Post-Doctoral Research Fellow 1989-92. Moving to Scotland, he joined the University of Strathclyde in Glasgow as a lecturer in 1992, was promoted to Reader in 1995, and was made Professor in 1998 which post he still holds. He has authored 5 books and over 200 research papers. His main research interests lie in the field of stochastic analysis including stochastic stability, stabilization, control, numerical solutions and stochastic modelling in finance, economic and population systems. He is the Executive Editor of Proceedings of the Royal Society of Edinburgh, Section A: Mathematics while he is also a member of the editorial boards of several international journals.

Host: Prof Nicolas Privault, Division of Mathematical Sciences, School of Physical and Mathematical Sciences

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