

Well-posedness and Approximation Properties of Signature CDEs

Tomás Carrondo

In this talk, I will introduce signature controlled differential equations (Sig-CDEs) as a natural and universal class within the framework of path-dependent controlled differential equations. A central open problem is the absence of a general existence and uniqueness theory, even in the simpler case of bounded variation drivers. I will present two equivalent formulations of Sig-CDEs and provide sufficient conditions for existence and uniqueness in each. Additionally, I will establish a stability result showing that any solution of a path-dependent CDE can be approximated, under mild assumptions and in a suitable sense, by a solution of a Sig-CDE. The aim is to offer new insights into the foundational theory of Sig-CDEs and their role in modelling path-dependent dynamics. This talk is based on recent and ongoing joint work with Christa Cuchiero, Paul Hager, and Fabian Harang.