February 3rd, 2020
KAP 414
2:00 P.M. – 3:00 P.M.

Professor Zhaoyu Zhang
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"PDGM: A Neural Network Approach To Solve Path-Dependent Partial Differential Equations"

Abstract: In this paper we propose a generalization of the Deep Galerking Method (DGM) of Sirignano and Spiliopoulos [2018] to deal with Path-Dependent Partial Differential Equations (PPDEs). These equations firstly appeared in the seminal work of Dupire [2009], where the functional Ito calculus was developed to deal with path-dependent financial derivatives contracts. The method, which we call Path-Dependent DGM (PDGM), consists of using a combination of feed-forward and Long Short-Term Memory architectures to model the solution of the PPDE. We then analyze several numerical examples, many from the Financial Mathematics literature, that show the capabilities of the method under very different situations.