RANDOMIZED SIGNATURES AND APPLICATIONS TO LEARNING OF STOCHASTIC DYNAMICS AND PORTFOLIO SELECTION

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Abstract

Several versions of signature processes have been proposed as flexible regression bases for path space functionals, most successfully by Terry Lyons and several co-authors. We complement this literature by analysing signature processes from the point of view of reservoir computing and therefore suggest a low dimensional randomized version of them. In order to prove in detail the expressive power of randomized signatures we apply methods from stochastic geometry and convex analysis. Examples from foundational aspects of Machine Learning, from learning Stochastic Dynamics, and from Portfolio Selection are discussed.