Asymptotics for the Laplace transform of the Elephant Random Walk

Juan Esaul González Rangel*[1]

[1]Laboratoire Angevin de Recherche en Mathématiques – Université d'Angers, Centre National de la Recherche Scientifique – France

Abstract

We give an asymptotic estimation in long time for the Laplace transform of the Elephant Random Walk (ERW). The ERW is a generalization of the Simple Random Walk in which the past influences the future evolution of the process according to some memory parameter. Its transition kernel is neither space nor time homogeneous and its transition probability at the nth step can be written as a function of n and the position of the walk at time $n-1$. We explore this property to apply classical singularity analysis methods on the generating function of the sequence of Laplace transforms. As an application, we are able to conclude the known result of a Large Deviations Principle for the ERW.

*Speaker