Control theory and large deviations

Armen Shirikyan

Abstract

We study Markovian random dynamical systems in a compact metric space. It is well known that such a system has a stationary measure, and our goal is to investigate the deviations of the time averages of functionals calculated on trajectories from the mean value with respect to the stationary measure, provided that the latter is unique. The main result is a sufficient condition for the validity of the large deviation principle in terms of controllability properties of an associated control problem. We also discuss an application of that result to the motion of a particle in a random fluid flow.

The results of this talk are obtained in collaboration with V. Jaksic (McGill University), V. Nersesyan (NYU Shanghai), C.-A. Pillet (CPT Marseille).