



Online
seminar

Tuesday **January 25** at 16:30

Hosted on: [Zoom](#)

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Inria

Optimization of large Markov dynamic systems, with several applications

Prof. Como introduces the seminar.

Abstract

In this talk I will explain how to deal with Markov decision processes, composed of a large number of objects and avoid the curse of dimensionality. I will show that the optimal value of such a Markov decision process, which satisfies a Bellman equation, converges to the solution of a continuous Hamilton-Jacobi-Bellman (HJB) equation based on the mean field approximation of the Markov decision process. I will also give bounds on the difference of their values and present an algorithm for deriving an approximating solution to the Markov decision process from a solution of the HJB equations. I will illustrate the method on several examples such as investment strategies, population dynamics control and scheduling in queues.

I will also mention pitfalls of this approach as well as extensions to systems with no drifts and systems with absorbing states.

Biography

Bruno Gaujal is an Inria research director in Grenoble, member of the performance evaluation team. Till Dec. 2015, he was the head of the large-scale computing team in Inria Grenoble-Rhône-Alpes. Previously, he has held several positions in AT&T Bell Labs (Murray Hill), INRIA Sophia-Antipolis, Loria and École Normale Supérieure of Lyon. He is a former student of École Normale Supérieure of Lyon and obtained his PhD from University of Nice in 1994, under the supervision of François Baccelli. He got his “Habilitation à diriger des recherches” in 2001 from the University of Nancy. He is the author of more than 100 scientific publications in journals and international conferences. He is a founding partner and a scientific advisor of a start-up company, RTaW, since 2007. His main interests are in performance evaluation, optimization and control of discrete event dynamic systems with applications to telecommunication networks and large computing infrastructures.