Résumé de l'intervention de Philippe Mary : « Apprentissage par renforcement dans les communications sans fil ».

Abstract :

Reinforcement learning in wireless communications

In this course, we will introduce the attendees to reinforcement learning algorithms and their application to wireless communications. Reinforcement learning can be rooted back to the behavioral psychology and dynamical programming in computer science. The foundation of reinforcement learning will be first reviewed and the class of problems suitable for being solved with a reinforcement learning algorithm introduced. Once the problem can be modeled with a Markov decision process, then reinforcement learning approach can be applied. We will briefly exposed the optimal solution of a Markov decision process and practical algorithms that can be used. Two applications in wireless communications will be given. The first one involves a mutli-armed bandit algorithm for opportunistic radio communications and the second a Q-learning approach to switch on or off base stations in a wireless network in order to save energy. The end of the talk will open perspectives on this fast-growing topic with the current theoretical and practical issues in this domain.