Séminaire Özgür Erçetin : «Intelligent Channel Sensing and Scheduling in Future Wireless Networks»

Bonjour à tous,

Vous êtes cordialement invités à participer au cinquième séminaire du LATECE de l'année 2017-2018. **Qui?** Özgür Erçetin, professeur à l'université de Sabancı à İstanbul **Quand?** Mercredi 22 novembre 2017 à 12h40 **Où**? PK-5115
Titre : Intelligent Channel Sensing and Scheduling in Future Wireless Networks

Résumé :

Contemporary wireless access schemes need full channel state information to function optimally. However, in many cases, obtaining full channel state information is practically infeasible or costly. In this presentation, we consider two problems in wireless networks, where learning algorithms can be used to intelligently sense the channels under resource constraints.

The first problem deals with an energy harvesting (EH) transmitter communicating over a time-correlated wireless channel. The transmitter is capable of sensing the current channel state, albeit at the cost of both energy and transmission time. The EH transmitter aims to maximize its long-term throughput by choosing among a number of actions at every time slot. The problem is formulated as a partially observable Markov decision process with a belief on the channel state. The optimal policy is shown to exhibit a threshold behavior on the belief state, with battery-dependent threshold values.

In the second problem, we consider scheduling under uncertain channel state information in a queuing system with random connectivity where a server (transmission time, frequency, wireless channel, etc) is shared among many users in a mutually exclusive manner. We establish a trade-off between scheduling a user with the highest queue-rate product (exploitation), and probing of users with outdated channel observations (exploration). The solution of this trade-off problem requires the prediction of the instantaneous user channel states, and the measurement of the associated level of uncertainty in the prediction. We adopt a Bayesian approach, and use Gaussian processes as a state-of-the-art regression method to predict the instantaneous user channel states.

SLIDES

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