Séminaire ICI : Iryna Andryianova, Maël Le Treust

11 Octobre 2016, 10:30 – 12:00

Date et lieu du séminaire

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Information Design for Strategic Coordination of Autonomous Devices with Non-Aligned Utilities

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Abstract: In this paper, we investigate the coordination of autonomous devices with non-aligned utility functions. Both encoder and decoder are considered as players, that choose the encoding and the decoding in order to maximize their long-run utility functions. The topology of the point-to-point network under investigation, suggests that the decoder implements a strategy, knowing in advance the strategy of the encoder. We characterize the encoding and decoding functions that form an equilibrium, by using empirical coordination. The equilibrium solution is related to an auxiliary game in which both players choose the conditional distributions in order to maximize their expected utilities. This problem is closely related to the literature on "Information Design" in Game Theory. We also characterize the set of posterior distributions that are compatible with a rate-limited channel between the encoder and the decoder. Finally, we provide an example of non-aligned utility functions corresponding to parallel fading multiple access channels.

Multi-Stage Quantum Turbo Codes with an Arbitrary Small Decoding Error Probability

Iryna Andriyanova, ETIS, équipe ICI.

Abstract: Quantum turbo codes (QTC) are easier to construct than their quantum LDPC counterparts as thanks the freedom in the choice of code parameters such as codelength, rate or memory size. The minimum distance of QTC can be designed unbounded (polynomial or sub-logarithmic in the codelength). However, the performance analysis of QTC shows that the error probability under iterative decoding is strictly positive. It was shown by Abbara&Tillich in 2013 that the error probability can be largely reduced by using the turbo code construction with two stages. Here we extend this result and consider a general multi-stage construction. By density evolution analysis over the erasure channel, we show that an arbitrarily small decoding erasure probability E can be achieved, when using the multi-stage construction with log(E) stages.