ID de Contribution: 7

7th talk : Fine Properties of the Optimal Skorokhod Embedding Problem.

vendredi 5 juillet 2019 10:50 (50 minutes)

We study the problem of stopping a Brownian motion at a given distribution ν while optimizing a reward function that depends on the (possibly randomized) stopping time and the Brownian motion. Our first result establishes that the set $T(\nu)$ of stopping times embedding ν is weakly dense in the set $R(\nu)$ of randomized embeddings. In particular, the optimal Skorokhod embedding problem over $T(\nu)$ has the same value as the relaxed one over $R(\nu)$ when the reward function is semicontinuous, which parallels a fundamental result about Monge maps and Kantorovich couplings in optimal transport. A second part studies the dual optimization in the sense of linear programming. While existence of a dual solution failed in previous formulations, we introduce a relaxation of the dual problem and establish existence of solutions as well as absence of a duality gap, even for irregular reward functions. This leads to a monotonicity principle which complements the key theorem of Beiglbock, Cox and Huesmann. These results can be applied to characterize the geometry of optimal embeddings through a variational condition. (Joint work with Mathias Beiglbock and Florian Stebegg)s over the years.

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