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Regret-Minimizing Aggregation of Anonymous Information (Joint work with Itai Arieli, Inbal Talgam-Cohen, and Konstantin Zabarniy)

Abstract

We study a model in which a decision maker aggregates information obtained from several symmetric agents. Each agent provides the decision maker with a binary recommendation about a state of nature, where the state is drawn from a known prior distribution. While the decision maker knows the marginal distribution of each agent's recommendation, the correlation between the recommendations is chosen adversarially. The decision maker's goal is to choose an information aggregation function minimizing the regret -- the difference between her own mistake probability when guessing the state of nature, and the mistake probability of a Bayesian decision maker knowing the correlation between the recommendations.

We provide a characterization of the minimal regret for any number of agents as the maximal Jensen gap of a convex function that captures the probability of a correct guess by a hypothetical Bayesian decision maker. For a large number of agents, we deduce that apart from some borderline cases, the unique optimal aggregation function is the random dictator rule that chooses an agent uniformly at random and adopts her recommendation.