IVAR EKELAND, University of British Columbia

A new type of equation arising from noncommitment in economics

In control theory one traditionally uses an exponential discount factor to arbitrage future gains agains current losses. It is well known that the optimal control problem then is solved by a Hamilton–Jacobi–Bellman equation for the value function. In joint work with Ali Lazrak, we point out that this approach completely breaks down when the discount is not exponential, and the decision-maker cannot commit. Instead of looking for optimal controls, one must then look for equilibrium strategies, and the HJB equation is then replaced by a remarkable integro-differential equation.