Verification Theorems
for stochastic optimal control problems and applications.

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Abstract:

A key tool in treating stochastic optimal control problems with the dynamic programming approach are the so-called Verification Theorems that give sufficient and/or necessary optimality conditions in term of the solution u of the Hamilton - Jacobi - Bellman (HJB) equation. The classical Verification Theorems (in finite and infinite dimension) require that u is $C^{1,2}$, i.e. once differentiable in time and twice in space.

Unfortunately such regularity is not true in many cases, especially in the infinite dimensional case where there is not a good regularity theory for fully nonlinear nondegenerate second order operators.

However it is still possible to find solutions for the HJB equations with weaker regularity, like viscosity solutions

In this seminar we first present the state of the art in the finite dimensional case and then present some new result in the infinite dimensional case. We also present some applications to applied model in economics and finance.