***Semi-Lagrangian schemes for Hamilton-Jacobi-Bellman equations***

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In this talk we consider the numerical solution of diffusion equations of Hamilton-Jacobi-Bellman type

$$u_t - \inf_{\alpha\in\mathcal{A}} \Big\{ L^\alpha[u](t,x) + c^\alpha(t,x)u + f^\alpha(t,x) \Big\} = 0 \qquad \text{in} \quad (0,T]\times\mathbb{R}^N,$$
$$u(0,x) = g(x) \quad \text{in} \quad \mathbb{R}^N,$$

where

$$L^\alpha[u](t,x) = \mathrm{tr}[a^\alpha(t,x)D^2u(t,x)] + b^\alpha(t,x)Du(t,x).$$

The solution of such problems can be interpreted as value function of a stochastic control problem. We introduce a class of monotone approximation schemes relying on monotone interpolation. Besides providing a unifying framework for several known first order accurate schemes, the presented class of schemes includes new methods that are second order accurate in space and converge for essentially monotone solutions. Some stability and convergence results are given and the method is applied to a super-replication problem from finance.