

Local minimization algorithms for dynamic programming equations

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Abstract: The numerical realization of the dynamic programming principle for continuous-time optimal control leads to nonlinear Hamilton-Jacobi-Bellman equations which require the minimization of a nonlinear mapping over the set of admissible controls. This minimization is often performed by comparison over a finite number of elements of the control set. In this paper we demonstrate the importance of an accurate realization of these minimization problems and propose algorithms by which this can be achieved effectively. The considered class of equations includes nonsmooth control problems with l_1 -penalization which lead to sparse controls.

This is joint work with Dante Kalise (RICAM, Austria) and Karl Kunisch (RICAM and University of Graz, Austria).