An Adaptive Multilevel Radial Basis Function Scheme for the HJB Equation

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Abstract: Semi-Lagrangian (SL) numerical schemes have proved to be an effective and natural strategy for the approximation of Dynamic Programming equations. The construction and approximation properties of SL schemes are crucially related to the choice of a particular space reconstruction operator.

In this talk, we will show the construction of an adaptive SL scheme based on a multilevel weighted least squares (Shepard) space reconstruction, in which a suitable measure of the residual is exploited in order to locate the singularities of solutions. We will discuss construction and efficiency of the scheme, and provide some preliminary theoretical analysis, as well as numerical results on control problems in low dimension.

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