

Monotone and consistent discretizations of HJB PDEs using Obtuse Superbases

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I will describe the discretizations of various diffusion PDEs and second order Hamilton-Jacobi-Bellman PDEs, on cartesian grid domains, using Obtuse Superbases as a key ingredient. These which are preferred, canonical, systems of coordinates in additive lattices of dimension 2 and 3. The proposed approach is versatile, enjoys some optimality properties, and achieves monotony thanks to the use of these tools of discrete geometry. As an illustration I will demonstrate a generalisation of Varadhan’s formula to Rander’s metrics, in other words compute distance maps and shortest paths with respect to some asymmetric Finsler metrics by solving monotone linear systems.

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