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Probabilistic numerical methods for fully-nonlinear PDEs

The theory of backward stochastic differential equations allows to extend the Feynman–Kac representation result to the case of quasilinear PDEs. By analogy with the linear case, this representation opened the door for probabilistic numerical methods for these equations. This result was further extended to fully nonlinear PDEs by means of the notion of second order backward stochastic differential equations. We provide convergence results for the numerical schemes suggested by this probabilistic representation, together with bounds on the rate of convergence.