

1108-60-9

**Erhan Bayraktar\*** (erhan@umich.edu), Department of Mathematics, 530 Church Street, Ann Arbor, MI 48109. *Stochastic Perron's Method.*

We show that the value function of a stochastic control problem is the unique solution of the associated Hamilton-Jacobi-Bellman (HJB) equation, completely avoiding the proof of the so-called dynamic programming principle (DPP). Using Stochastic Perron's method we construct a super-solution lying below the value function and a sub-solution dominating it. A comparison argument easily closes the proof. The program has the precise meaning of verification for viscosity-solutions, obtaining the DPP as a conclusion. It also immediately follows that the weak and strong formulations of the stochastic control problem have the same value. Using this method we also capture the possible face-lifting phenomenon in a straightforward manner. This method becomes especially handy in problems with Knightian uncertainty. (Received October 16, 2014)