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Exact solutions to the homing problem for a Wiener process with jumps

Communication Info

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Abstract

Stochastic optimal control as a classic topic of applied mathematics has seen significant developments in recent years.

As named by Whittle [1], LQG homing problem represents one of the most interesting problems whose solutions have applications in engineering, financial mathematics, mathematical biology, medicine and epidemiology, see [2,3,4]. The role and the use of the stochastic linear-quadratic-gaussian problem in control system design was justified in [5].

In this work, we precisely consider the problem of optimally controlling a one-dimensional Wiener process with Poissonian jumps until it leaves the interval [a, b]. The exact optimal control is obtained in a particular case by solving the differential-difference equation satisfied by the value function. An approximate solution is also presented in a more general case. This approximate solution is appropriate when the jump size is small.

References

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