

Polynomial chaos expansion for solving stochastic control problems

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We consider the infinite dimensional stochastic linear quadratic optimal control problem and provide a numerical framework for solving this problem using a polynomial chaos expansion approach. The resulting system consists of a set of deterministic partial differential equations in terms of the coefficients of the state and the control variables. For each equation, we then set up an optimal control problem. We solve the arising problems by deterministic numerical methods and thus obtain an approximation of the stochastic problem. We show some numerical examples and compare our approach to the standard one. Moreover, we discuss the difference between the finite and infinite horizon case.

References

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