

Numerical Algorithms for Solving Optimal Control Problems with Integro-Differential Equations of the Second Kind as Constraints

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Abstract

This study presents numerical algorithms for solving optimal control problems with a class of integro-differential equations of the second kind as constraints. This class of equations consists of an integro-differential term containing an Abel-type kernel. The first kind equations, with a weakly singular kernel, investigated here appear in the mathematical model of an aeroelasticity problem [1]. Two controls are considered in this study: delay and stochastic. The feasibility of the proposed numerical algorithm is demonstrated with examples in which the costs are compared with deterministic optimal controls without time lag.

Keyword : optimal control, integro-differential equations of the second kind, delay, stochastic