

## Optimal Control of Volterra Integro-Differential Systems Based on Legendre Wavelets and Collocation Method

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**Abstract :** In this paper, the numerical solution of optimal control problem (OCP) for systems governed by Volterra integro-differential (VID) equation is considered. The method is developed by means of the Legendre wavelet approximation and collocation method. The properties of Legendre wavelet accompany with Gaussian integration method are utilized to reduce the problem to the solution of nonlinear programming one. Some numerical examples are given to confirm the accuracy and ease of implementation of the method.

**Keywords :** collocation method, Legendre wavelet, optimal control, Volterra integro-differential equation

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