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[Open Access](#)**New algorithms for numerical assessment of nonlinear integro-differential equations of second-order using Haar wavelets** (Article)Aziz, I.^a, Siraj-ul-Islam, S.^b, Fayyaz, M.^c, Azram, M.^d^a Department of Mathematics, University of Peshawar, Pakistan^b Department of Basic Sciences, University of Engineering and Technology, Peshawar, Pakistan^c Department of Computer Science, CECOS University Peshawar, Pakistan^d Department of Science in Engineering, International Islamic University Malaysia, Kuala Lumpur, Malaysia[Hide additional affiliations](#)[View references \(19\)](#)

Abstract

This paper deals with the extended design for Fredholm and Volterra integral equations and design for Fredholm and Volterra integro-differential equations of first-order to second-order nonlinear Fredholm and second-order nonlinear Volterra integro-differential equations having square integrable kernels. This approach utilizes the inherent dynamics of the Haar wavelet. The Haar wavelet is used to provide a single platform for the proposed method. The method is tested on problems from literature, and **numerical** results are compared with existing methods. The **numerical** results indicate that the accuracy of the method is reasonably high, even on a coarse grid. © 2015, Walailak University. All Rights Reserved.

Author keywords

Collocation method; Haar wavelet; Second-order fredholm integro-differential equation of second kind; Second-order volterra integro-differential equations of second kind

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