A numerical scheme based on Haar wavelets transform for solutions of integral equations

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In this paper, we have proposed a new numerical technique based on Haar wavelet transform for solving Voltrra and Fredholm integral equations. Such type of equations occurs widely in the diverse area of the applied mechanics and physics. In the development of numerical technique, first, we convert the integral equations into initial and boundary value problems and then solve it by Haar wavelets based numerical technique. More accurate solution is obtained by wavelet decomposition in the form of a multiresolution analysis of the function which represents solution of initial and boundary value problems. Through this analysis, solution is found on the coarse grid points and refined towards higher accuracy by increasing the level of the Haar wavelets. The accuracy of the proposed method is demonstrated by some test problems. The numerical results are found in good agreement with exact solutions. Finally, the error analysis of the proposed method has been discussed.