

Title : Application of Haar Wavelet Method for Solving Differential Equations

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ABSTRACT

Differential equations are fundamental for analyzing dynamic systems and are widely used in many fields. However, obtaining analytical solutions is often difficult or even impossible. Therefore, numerical methods are essential for solving these equations. This study investigates the fundamental properties of Haar wavelets and applies the Haar wavelet method to solve differential equations. The SIR model, a system of nonlinear ordinary differential equations used to study the dynamics of infectious diseases, serves as a case study. This research will approximate solutions to the SIR model under various initial conditions and epidemic scenarios, including the initial, peak, and recovery phases of an outbreak, to evaluate the effectiveness of the Haar wavelet method.