

عنوان مقاله:

Homotopy analysis method and its application for solving integro-differential equations of fractional order

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خلاصه مقاله:

In this paper, based on the homotopy analysis method (HAM), a analytical technique is proposed to solve nonlinear fractional integro-differential equations (FIDEs). Different from all other analytical methods, it provides a simple way to adjust and control the convergence region of series solution by introducing an auxiliary parameter \sim . This work illustrates the validity and high accuracy of the homotopy analysis method for the non-linear integro-differential equations with fractional order. The basic concepts of the HAM can be widely used to solve other strongly non-linear fractional problems. Several numerical examples are given to illustrate the convergence of approximate solutions to analytical solutions. The comparison of the results obtained by the HAM with the exact solutions show that the HAM is very effective and simple for solving various linear and nonlinear fractional problems.

کلمات کلیدی:

Homotopy analysis method; Fractional integro-differential equation; Series solution; Approximate analytical solutions; Caputo fractional derivative

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