NUMERICAL APPROXIMATION METHOD FOR HYBRID NONLINEAR CAPUTO FRACTIONAL DIFFERENTIAL EQUATIONS WITH BOUNDARY VALUE CONDITIONS

K. Ben Amara [♭],[1] and M. I. Berenguer[♢]

(♭) Department of Mathematics. Faculty of Sciences of Sfax,
University of Sfax. Road Soukra Km $3.5 B.P. 1171, 3000$, Sfax, Tunisia.
(♢) Department of Applied Mathematics and Institute of Mathematics (IMAG),
E.T.S. de Ingeniería de Edificación, University of Granada, Granada, Spain.

Abstract

In this paper, a new numerical approach for studying the problem of existence and approximation of solution for a large class of fractional integro-differential equation with boundary conditions is introduced. The method is based on a combination of biorthogonal basis and fixed point theory. First, the existence and uniqueness of a continuous solution for such problem are established, and after that, a numerical method to approximate the unique solution is constructed. Finally, some numerical examples are prepared to illustrated the accuracy and efficiency of the presented method.

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[1] khaled.benamara.etud@fss.usf.tn