

# Non-linear Volterra Fractional Integro- differential Equations: Existence Theory and Semi- Analytical Investigation

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## Editorial

A non-linear equation may be an equation that's not an equation within the unknown perform and its derivatives. There are a unit only a few ways of determination nonlinear differential equations exactly; those who area unit better-known usually depend upon the equation having explicit symmetries. Nonlinear differential equations will exhibit terribly sophisticated behavior over extended time intervals, characteristic of chaos. Even the elemental queries of existence, uniqueness, and extendibility of solutions for nonlinear differential equations, and well-posedness of initial and boundary worth issues for nonlinear PDEs area unit laborious issues and their resolution in special cases are taken into account to be a major advance within the mathematical theory Naive–Stokes existence and smoothness). However, if the equation may be a properly developed illustration of an important physical method, then one expects it to own an answer

Integral equations have totally different kind of wide applications in several areas of physics and applied math, like time mechanics, geophysics, potential theory, electricity and magnetism, improvement, renewal theory, kinetic theory of gases, quantum physics, radiation, best management systems, mathematical economic science, branch of knowledge, queuing theory, mathematical issues of radiative equilibrium, acoustics, steady state heat physical phenomenon, hydraulics and fracture mechanics. Many physical issues in Bio-sciences, Acoustics, natural philosophy, Viscoelasticity, Hydrology, Finance, Biology and alternative mathematical and physical areas will be sculptural by FIDES

PDEs will be accustomed describe a good style of phenomena in nature like sound, heat, physics, electrodynamics, fluid flow, elasticity, or quantum physics. These on the face of it distinct physical phenomena will be formalized equally in terms of PDEs. Even as normal differential equations usually model one-dimensional projectile systems, partial differential equations usually model multidimensional systems. Random partial differential equations generalize

partial differential equations for modeling randomness.

Analytical solutions of integro-differential equations aren't possible. Visible of numerical solutions various differential, integral, and integro-differential equations are resolved recently by totally different techniques, like collocation methodology, hybrid collocation methodology, unified methodology and Galerkin ways. Laplace adomian decomposition methodology may be a hybrid technique fashioned by the coupling of Marquis de Laplace transformation with adwoman decomposition methodology. Thus this methodology is understood as Pierre Simon de Laplace adomian decomposition methodology (LADM). In the author and coauthors applied LADM to general fisher's equation for analytical answer. Researchers recently studied LADM technique for multidimensional time aliquot model of Navier Stokes equation.

## Equation order

Differential equations area unit represented by their order, determined by the term with the best derivatives. Associate equation containing solely 1st derivatives may be a first-order equation; associate equation containing the second by-product may be a second-order equation, and so on.

The theory of differential equations is closely associated with the speculation of distinction equations, within which the coordinates assume solely separate values, and therefore the relationship involves values of the unknown perform or functions and values at near coordinates. Several ways to reckon numerical solutions of equations or study the properties of differential equations involve the approximation of the answer of a differential equation by the answer of a corresponding distinction equation. The mathematical theory of differential equations 1st developed at the side of the sciences wherever the equations had originated and wherever the results found application. One in all the necessary integral equations is volterra integral equation that happens extensively in several scientific fields like approximation theory, machine arithmetic and physical arithmetic.

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Received 10 November 2021; Accepted 15 November 2021; Published 22 November 2021

How to cite this article: Husam Alrbaiah. "Non-linear Volterra Fractional Integro- differential Equations: Existence Theory and Semi-Analytical Investigation." *J Appl Computat Math* 9 (2021): 493.