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Iterative Algorithms And Left-Right Caputo Fractional Derivatives -- Iterative Methods On Banach Spaces With A Convergence Structure And Fractional Calculus -- Inexact Gauss-Newton Method For Singular Equations -- The Asymptotic Mesh Independence Principle -- Ball Convergence Of A Sixth Order Iterative Method -- Broyden's Method With Regularly Continuous Divided Differences -- Left General Fractional Monotone Approximation -- Right General Fractional Monotone Approximation Theor -- Left Generalized High Order Fractional Monotone Approximation -- Right Generalized High Order Fractional Monotone Approximation -- Advanced Fractional Taylor's Formulae -- Generalized Canavati Type Fractional Taylor's Formulae.

| Sommario/riassunto | In this monograph the authors present Newton-type, Newton-like and other numerical methods, which involve fractional derivatives and fractional integral operators, for the first time studied in the literature. All for the purpose to solve numerically equations whose associated functions can be also non-differentiable in the ordinary sense. That is among others extending the classical Newton method theory which requires usual differentiability of function. Chapters are self-contained and can be read independently and several advanced courses can be taught out of this book. An extensive list of references is given per chapter. The book's results are expected to find applications in many areas of applied mathematics, stochastics, computer science and engineering. As such this monograph is suitable for researchers, graduate students, and seminars of the above subjects, also to be in all science and engineering libraries. |