



Special Issue Reprint

Fractional Mathematical Modelling

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Edited by

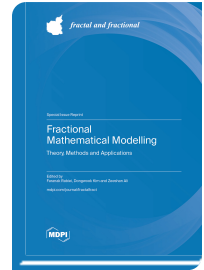
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This Reprint presents recent advances in fractional calculus, organized into three main themes: theoretical developments, methodological advances, and applications. Theoretical contributions examine two forms of the Riemann–Liouville derivative and their impact on solution structures, and introduce anomalous diffusion models based on regularized general fractional derivatives with Sonin kernels. Methodological studies focus on improved analytical and numerical approaches, including the optimal q-Homotopy Analysis Method, iterative and perturbation techniques for nonlinear equations, and applications of the fractional differential quadrature method to nonlinear and high-dimensional systems. Applications demonstrate the breadth of fractional modeling, covering fuzzy systems and controllability, fractional-order boost converters, viscoelastic dampers, ZnO nanostructures, solar-cell charge dynamics, and personalized fractional-order controllers for anaesthesia. Together, these works highlight how fractional calculus continues to advance through theoretical developments, methodological advances, and practical applications across science, engineering, and medicine.

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