

Studies in Systems, Decision and Control 362

George A. Anastassiou

Constructive Fractional Analysis with Applications

This book includes constructive approximation theory; it presents ordinary and fractional approximations by positive sublinear operators, and high order approximation by multivariate generalized Picard, Gauss–Weierstrass, Poisson–Cauchy and trigonometric singular integrals. Constructive and Computational Fractional Analysis recently is more and more in the center of mathematics because of their great applications in the real world. In this book, all presented is original work by the author given at a very general level to cover a maximum number of cases in various applications. The author applies generalized fractional differentiation techniques of Riemann–Liouville, Caputo and Canavati types and of fractional variable order to various kinds of inequalities such as of Opial, Hardy, Hilbert–Pachpatte and on the spherical shell. He continues with E. R. Love left- and right-side fractional integral inequalities. They follow fractional Landau inequalities, of left and right sides, univariate and multivariate, including ones for Semigroups. These are developed to all possible directions, and right-side multivariate fractional Taylor formulae are proven for the purpose. It continues with several Gronwall fractional inequalities of variable order. This book results are expected to find applications in many areas of pure and applied mathematics. As such this book is suitable for researchers, graduate students and seminars of the above disciplines, also to be in all science and engineering libraries.

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