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Basic Theory of Fractional Differential Equations (2nd Edition)

Special Functions in Fractional Calculus and Related Fractional Differintegral Equations

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Fractional derivative as fractional power of derivative

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Fractal derivative and operators and their applications

Fractional Calculus & Applied Analysis

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Latest SCI Journal Papers on FDA

(Searched on Nov 15, 2016)

A new reproducing kernel method for variable order fractional boundary value problems for functional differential equations
By: Li, Xiuying; Wu, Boying
JOURNAL OF COMPUTATIONAL AND APPLIED MATHEMATICS Volume: 311 Pages: 387-393 Published: FEB 2017

Well-posedness and persistence properties for two-component higher order Camassa-Holm systems with fractional inertia operator
By:Chen, Rong; Zhou, Shouming
NONLINEAR ANALYSIS-REAL WORLD APPLICATIONS Volume: 33 Pages: 121-138 Published: FEB 2017

The fractional Hartree equation without the Ambrosetti-Rabinowitz condition

By: Francesconi, Mauro; Mugnai, Dimitri
NONLINEAR ANALYSIS-REAL WORLD APPLICATIONS Volume: 33 Pages: 363-375 Published: FEB 2017

Persistence of low levels of plasma viremia and of the latent reservoir in patients under ART: A fractional-order approach
By: Pinto, Carla M. A.
COMMUNICATIONS IN NONLINEAR SCIENCE AND NUMERICAL SIMULATION Volume: 43 Pages: 251-260 Published: FEB 2017

Picard iteration and Pade approximations for stiff fractional point kinetics equations
By: Nahla, Abdallah A.; Hemeda, A. A.
APPLIED MATHEMATICS AND COMPUTATION Volume: 293 Pages: 72-80 Published: JAN 15 2017

Solving differential equations of fractional order using an optimization technique based on training artificial neural network
By: Pakdaman, M.; Ahmadian, A.; Effati, S.; et al.
APPLIED MATHEMATICS AND COMPUTATION Volume: 293 Pages: 81-95 Published: JAN 15 2017

Controlling bifurcation in a delayed fractional predator-prey system with incommensurate orders
By: Huang, Chengdai; Cao, Jinde; Xiao, Min; et al.
APPLIED MATHEMATICS AND COMPUTATION Volume: 293 Pages: 293-310 Published: JAN 15 2017

A new representation formula for the Hilfer fractional derivative and its application
By:Kamocki, Rafal
JOURNAL OF COMPUTATIONAL AND APPLIED MATHEMATICS Volume: 308 Pages: 39-45 Published: DEC 15 2016

A cubic trigonometric B-spline collocation approach for the fractional sub-diffusion equations
By: Yaseen, Muhammad; Abbas, Muhammad; Ismail, Ahmad Izani; et al.
APPLIED MATHEMATICS AND COMPUTATION Volume: 293 Pages: 311-319 Published: JAN 15 2017

Mittag-Leffler stability analysis of nonlinear fractional-order systems with impulses
By: Yang, Xujun; Li, Chuandong; Huang, Tingwen; et al.
APPLIED MATHEMATICS AND COMPUTATION Volume: 293 Pages: 416-422 Published: JAN 15 2017

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Call for Papers

SPECIAL SESSION ON "Fractional Calculus in Mechatronic Systems"

------ for CODIT'17, April 5-7, 2017 – Barcelona, Spain

https://easychair.org/conferences/?conf=codit17

Session description

This special session deals with the application of fractional order operators (derivatives and integrals) to mechatronic systems. The goal is to give an overview on the possibilities of using fractional calculus in the different stages of the development of such systems, from modelling to implementation.

The topics of interest include, but are not limited to, applications in:

- Servomechanisms
- MEMS and Smart Materials
- Automotive Systems
- Biomechanics
- Robotics and Unmaned Vehicles
- Biorobotics
- Embedded Systems

Important Dates

December 4, 2016: deadline for paper submission

February 2, 2017: notification of acceptance/reject

February 26, 2017: deadline for final paper and registration.

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Books

Basic Theory of Fractional Differential Equations (2nd Edition)

By (author): Yong Zhou (Xiangtan University, China)

JinRong Wang (Guizhou University, China)

Lu Zhang (Xiangtan University, China)

Book Description

This monograph is devoted to a rapidly developing area on the research of qualitative theory of fractional ordinary and partial differential equations. It provides the readers the necessary background material required to go further into the subject and explore the rich research literature. The tools used include many classical and modern nonlinear analysis methods such as fixed point theory, measure of noncompactness method, topological degree method, the technique of Picard operators, critical point theory and semigroup theory. Based on the research work carried out by the authors and other experts during the past seven years, the contents are very recent and comprehensive.

In this edition, two new topics have been added, that is, fractional impulsive differential equations, and fractional partial differential equations including fractional Navier–Stokes equations and fractional diffusion equations.

More information on this book can be found by the following links:
http://www.worldscientific.com/worldscibooks/10.1142/10238

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Special Functions in Fractional Calculus and Related Fractional Differintegral Equations

By (author): Hari M Srivastava (University of Victoria, Canada),

R K Raina (M P University of Agriculture and Technology, India)

Xiao-Jun Yang (China University of Mining and Technology, China)

Book Description

The subject of fractional calculus (that is, calculus of integrals and derivatives of any arbitrary real or complex order) has gained considerable popularity and importance during the past four decades, due mainly to its demonstrated applications in numerous seemingly diverse and widespread fields of science and engineering. It does indeed provide several potentially useful tools for solving differential, integral and differintegral equations, and various other problems involving special functions of mathematical physics as well as their extensions and generalizations in one and more variables. Many books and monographs (and conference proceedings) deal with the subject of fractional calculus and its applications. However, to the best of our knowledge, there does not exist an exclusive work that co-ordinates the disciplines of fractional calculus and special functions in a potentially useful manner. This book is an attempt in that direction and would serve a dual purpose: in providing key formulas and identities involving special functions and also in opening up some novel avenues of applications of fractional calculus.

More information on this book can be found by the following link:
http://www.worldscientific.com/worldscibooks/10.1142/8936

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Journals

Neurocomputing

(selected)

Fractional discrete-time of Hegselmann–Krause's type consensus model with numerical simulations

Dorota Mozyrska, Małgorzata Wyrwas;

Impulsive synchronization of fractional order chaotic systems with time-delay

Dong Li, Xingpeng Zhang

Static output feedback stabilization for fractional-order systems in T-S fuzzy models

Chong Lin, Bing Chen, Qing-Guo Wang

Robust consensus of fractional multi-agent systems with external disturbances

Guojian Ren, Yongguang Yu

Complex nonlinear dynamics in fractional and integer order memristor-based systems

Xia Huang, Jia Jia, Yuxia Li, Zhen Wang

Global Mittag–Leffler stability for a coupled system of fractional-order differential equations on network with feedback controls

Hong-Li Li, Cheng Hu, Yao-Lin Jiang, Long Zhang, Zhidong Teng

Mittag–Leffler stability analysis on variable-time impulsive fractional-order neural networks

Xujun Yang, Chuandong Li, Qiankun Song, Tingwen Huang, Xiaofeng Chen

Global dissipativity of fractional-order neural networks with time delays and discontinuous activations

Zhixia Ding, Yi Shen

A modified sliding mode approach for synchronization of fractional-order chaotic/hyperchaotic systems by using new self-structuring hierarchical type-2 fuzzy neural network”

A. Mohammadzadeh, S. Ghaem

Decentralized adaptive coupling synchronization of fractional-order complex-variable dynamical networks

Quan Xu, Shengxian Zhuang, Sijia Liu, Jian Xiao

Finite-time stability and finite-time boundedness of fractional order linear systems

Ya-jing Ma, Bao-wei Wu, Yue-E Wang

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Journal of Sound and Vibration

(selected)

Coefficient of restitution in fractional viscoelastic compliant impacts using fractional Chebyshev collocation

Arman Dabiri, Eric A. Butcher, Morad Nazari

Dichotomous-noise-induced chaos in a generalized Duffing-type oscillator with fractional-order deflection

Youming Lei, Rui Fu, Yong Yang, Yanyan Wang

A PDEM based new methodology for stochastic dynamic stability control of nonlinear structures with fractional-type viscoelastic dampers

Jun Xu

Viscoelastic bearings with fractional constitutive law for fractional tuned mass dampers

G. Barone, M. Di Paola, F. Lo Iacono, G. Navarra

A nonlinear and fractional derivative viscoelastic model for rail pads in the dynamic analysis of coupled vehicle–slab track systems

Shengyang Zhu, Chengbiao Cai, Pol D. Spanos

Flutter analysis of a flag of fractional viscoelastic material

Ming Chen, Lai-Bing Jia, Xiao-Peng Chen, Xie-Zhen Yin

Higher-order stochastic averaging to study stability of a fractional viscoelastic column

J. Deng, W.-C. Xie, M.D. Pandey

Free vibrations of a taut cable with a general viscoelastic damper modeled by fractional derivatives

Limin Sun, Lin Chen

Stochastic stability of a fractional viscoelastic column under bounded noise excitation

J. Deng, W.-C. Xie, M.D. Pandey

Dispersion curves of viscoelastic plane waves and Rayleigh surface wave in high frequency range with fractional derivatives

Tsuneo Usuki

Dispersion curves for 3D viscoelastic beams of solid circular cross section with fractional derivatives

Tsuneo Usuki

Application of multi-scale chirplet path pursuit and fractional Fourier transform for gear fault detection in speed up and speed-down processes

Jiesi Luo, Dejie Yu, Ming Liang

The residue harmonic balance for fractional order van der Pol like oscillators

A.Y.T. Leung, H.X. Yang, Z.J. Guo

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Paper Highlight

Characterizing time dependent anomalous diffusion process: A survey on fractional derivative and nonlinear models

Wei, Song; Chen, Wen; Hon, Y. C.

Publication information: PHYSICA A-STATISTICAL MECHANICS AND ITS APPLICATIONS Volume: 462 Pages: 1244-1251 Published: NOV 15 2016

http://www.sciencedirect.com/science/article/pii/S0378437116304277

Abstract

This paper investigates the temporal effects in the modeling of flows through porous media and particles transport. Studies will be made among the time fractional diffusion model and two classical nonlinear diffusion models. The effects of the parameters upon the mentioned models have been studied. By simulating the sub-diffusion processes and comparing the numerical results of these models under different boundary conditions, we can conclude that the time fractional diffusion model is more suitable for simulating the sub-diffusion with steady diffusion rate; whereas the nonlinear models are more appropriate for depicting the sub-diffusion under changing diffusion rate.

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Fractional derivative as fractional power of derivative

Tarasov, Vasily E.

Publication information: INTERNATIONAL JOURNAL OF MATHEMATICS Volume: 18 Issue: 3 Pages: 281-299 Published: MAR 2007

http://www.worldscientific.com/doi/abs/10.1142/S0129167X07004102?journalCode=ijm

Abstract

Definitions of fractional derivatives as fractional powers of derivative operators are suggested. The Taylor series and Fourier series are used to define fractional power of self-adjoint derivative operator. The Fourier integrals and Weyl quantization procedure are applied to derive the definition of fractional derivative operator. Fractional generalization of concept of stability is considered.

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