FDA Express Vol. 21, No. 3, Dec 15, 2016

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◆ Latest SCI Journal Papers on FDA

(Searched on Dec 15, 2016)

◆ Call for papers

SPECIAL SESSION ON "Modern fractional dynamic systems and applications"

"The 2017 Symposium on Fractional Derivatives and Their Applications" (FDTA '17)

◆ Books

Fractional Calculus: Theory

Fractional Calculus: Applications

◆ Journals

Applied Mathematics Letters

Fractional Calculus & Applied Analysis

◆ Paper Highlight

On a fractional Zener elastic wave equation

Fractional derivative as fractional power of derivative

◆ Websites of Interest

Fractal derivative and operators and their applications

Fractional Calculus & Applied Analysis

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Latest SCI Journal Papers on FDA

(Searched on Dec 15, 2016)

Fundamental solutions of the time fractional diffusion-wave and parabolic Dirac operators
By: Ferreira, M.; Vieira, N.
JOURNAL OF MATHEMATICAL ANALYSIS AND APPLICATIONS Volume: 447 Issue: 1 Pages: 329-353 Published: MAR 1 2017

Mitigation of Subsynchronous Resonance with Fractional-order PI based UPFC controller
By:Raju, D. Koteswara; Umre, Bhimrao S.; Junghare, Anjali S.; et al.
MECHANICAL SYSTEMS AND SIGNAL PROCESSING Volume: 85 Pages: 698-715 Published: FEB 15 2017

Hermite-Hadamard and Hermite-Hadamard-Fejer type inequalities for generalized fractional integrals
By: Chen, Hua; Katugampola, Udita N.
JOURNAL OF MATHEMATICAL ANALYSIS AND APPLICATIONS Volume: 446 Issue: 2 Pages: 1274-1291 Published: FEB 15 2017

On M-Wright transforms and time-fractional diffusion equations
By: Moslehi, Leila; Ansari, Alireza
INTEGRAL TRANSFORMS AND SPECIAL FUNCTIONS Volume: 28 Issue: 2 Pages: 113-129 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

On critical systems involving fractional Laplacian
By: Guo, Zhenyu; Luo, Senping; Zou, Wenming
JOURNAL OF MATHEMATICAL ANALYSIS AND APPLICATIONS Volume: 446 Issue: 1 Pages: 681-706 Published: FEB 1 2017

Design of unsupervised fractional neural network model optimized with interior point algorithm for solving Bagley-Torvik equation
By: Raja, Muhammad Asif Zahoor; Samar, Raza; Manzar, Muhammad Anwar; et al.
MATHEMATICS AND COMPUTERS IN SIMULATION Volume: 132 Pages: 139-158 Published: FEB 2017

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

Lyapunov functions for a class of nonlinear systems using Caputo derivative
By: Fernandez-Anaya, G.; Nava-Antonio, G.; Jamous-Galante, J.; et al.
COMMUNICATIONS IN NONLINEAR SCIENCE AND NUMERICAL SIMULATION Volume: 43 Pages: 91-99 Published: FEB 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

[Back]

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Call for Papers

SPECIAL SESSION ON "Modern fractional dynamic systems and applications"

------ Journal of Computational and Applied Mathematics

https://www.journals.elsevier.com/journal-of-computational-and-applied-mathematics/call-for-papers/special-issue-on-modern-fractional-dynamic-systems-and-appli

Session description

In a letter dated 30th September 1695, Fractional Calculus was born within a serious discussion between Leibniz and L'Hopital about the possibility and meaning of half order derivative! Fractional dynamic systems have been dealt almost by mathematicians only during three centuries ago. In the past decades, this subject and its potential applications have gained a lot of importance, mainly because fractional calculus has become a powerful tool with more accurate and successful results in modeling several complex phenomena in numerous seemingly diverse and widespread fields of science and engineering. It was found that various, especially interdisciplinary applications, can be elegantly modeled with the help of fractional derivatives. Since fractional dynamic systems grow, mature and develop, it is very important to focus on the most promising new directions that were formulated based on the modern techniques and approaches presented recently in the field. This special issue will consider strictly strong papers resulted from modern theoretical, experimental and applied aspects in fractional dynamic systems. We also strongly encourage young researchers/PhD students who were obtained new contributions well supervised and guided by experts to submit their eminent papers to this special issue. Note that submitted papers should be explicitly meeting with the Aims and Scope of CAM journal.

Topics to be included:

Survey on modern fractional calculus

Computational methods for fractional dynamical systems

Fractional Inverse Problems: Modeling and Simulation

Control & optimization fractional systems

Latest advancements in numerical methods for fractional PDE

Applications of fractional problems in science and engineering

Heat transfer involving local fractional operators

Waves, wavelets and fractal: fractional calculus approach

Guest Editors

Prof. Amar Debbouche (managing guest editor)
Guelma University, Algeria
amar_debbouche@yahoo.fr

Prof. Carlos Lizama
University of Santiago de Chile, Chile
carlos.lizama@usach.cl

Prof. Xiao-Jun Yang
China University of Mining and Technology, China
dyangxiaojun@163.com

[Back]

"The 2017 Symposium on Fractional Derivatives and Their Applications" (FDTA '17)

------ Cleveland, Ohio–USA, August 6–9, 2017

http://iel.ucdavis.edu/mesa/conferences.php

https://www.asme.org/events/idetccie.

Description

The FDTA (Symposium on Fractional Derivatives and Their Applications) was started by Prof. Om Agrawal and other FDTA colleagues in 2003, and continued in odd years.

For the 2017 FDTA Symposium under ASME/IEEE MESA17, papers are solicited in the area of fractional derivatives and their applications. The subjects of the papers may include, but are not limited to,

– mathematical modeling of fractional dynamic systems, analytical and numerical techniques to solve these equations, fractional model of viscoelastic damping;

– large scale finite element models of fractional systems and associated numerical scheme;

– fractional controller design and system identification;

– stability analysis of fractional systems, nonlinear and stochastic fractional dynamic systems;

– fractional order models and their experimental verifications, and applications of fractional models to engineering systems in general and mechatronic embedded systems in particular;

– fractional calculus based models for cyber-physical systems (CPS) and cyber-human systems (CHS), and in general, intelligent adaptive systems (IAS);

– fractional calculus based better characterization of complex systems in general.

Papers with the e-mail addresses of the authors must be submitted online abstract(s) at https://www.asme.org/events/idetccie by **January 06, 2017**. After the abstract submission, authors should submit a full length paper for peer review by **Feb. 10, 2017**. All manuscripts after a successful review procedure will be published in EI-indexed conference proceedings.

Communicated by: YangQuan Chen,
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[Back]

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Books

Fractional calculus : theory

Editors: Roy Abi Zeid Daou (Lebanese German University, Sahel Alma Campus, Keserwane, Lebanon)

Xavier Moreau (Université Bordeaux, 351, cours de la Libération, 33405 Talence - France)

Book Description

The first volume of this two-volume book, presents history, the mathematical modeling and the applications of fractional order systems, and contains mathematical and theoretical studies and research related to this domain. This volume is made up of 11 chapters. The first chapter presents an analysis of the Caputo derivative and the pseudo state representation with the infinite state approach. The second chapter studies the stability of a class of fractional Cauchy problems. The third chapter shows how to solve fractional order differential equations and fractional order partial differential equations using modern matrix algebraic approaches. Following this chapter, chapter four proposes another analytical method to solve differential equations with local fractional derivative operators. Concerning chapter five, it presents the extended Borel transform and its related fractional analysis. After presenting the analytical resolution methods for fractional calculus, chapter six shows the essentials of fractional calculus on discrete settings. The initialization of such systems is shown in chapter seven. In fact, this chapter presents a generalized application of the Hankel operator for initialization of fractional order systems. The last four chapters show some new studies and applications of non-integer calculus. In fact, chapter eight presents the fractional reaction-transport equations and evanescent continuous time random walks. Chapter nine shows a novel approach in the exponential integrators for fractional differential equations. Chapter ten presents the non-fragile tuning of fractional order PD controllers for integrating time delay systems. At the end, chapter eleven proposes a discrete finite-dimensional approximation of linear infinite dimensional systems. To sum up, this volume presents a mathematical and theoretical study of fractional calculus along with a stability study and some applications. This volume ends up with some new techniques and methods applied in fractional calculus. This volume will be followed up by a second volume that focuses on the applications of fractional calculus in several engineering domains. (Imprint: Nova)

More information on this book can be found by the following links:
https://www.novapublishers.com/catalog/product_info.php?products_id=51585&osCsid=9e8d957fe8c4dbae3d13a362fa8e83b8

[Back]

Fractional Calculus: Applications

By (author): Roy Abi Zeid Daou (Lebanese German University, Sahel Alma Campus, Keserwane, Lebanon)

Xavier Moreau (Université Bordeaux, 351, cours de la Libération, 33405 Talence - France)

Book Description

After presenting the first volume of this two-volume book, presenting a lot of mathematical and theoretical studies and research related to non-integer calculus, the second volume illustrates applications related to this domain. This volume is made up of 11 chapters. The first chapter presents the heuristic power of the non-integer differential operators in physics starting from the chaos to the emergence, the auto-organizations and the holistic rules. The second chapter shows the dynamics of the fractional order chaotic systems along with some applications. The third chapter represents the pressure control of gas engines by non-integer order controllers by showing

a novel trend in the application of the fractional calculus to automotive systems. Chapter 4 shows the way to model fractional order equations using state space modeling along with some applications. Another application related to this domain is the thermal diffusive interface. Chapter 5 shows the analysis of a semi-infinite diffuse plane medium along with the equations that model this medium, and some frequency and time domain responses. However, Chapter 6 treats this problem by controlling this plant using the well-known CRONE controller. Chapter 8 presents the adaptive second-order fractional sliding mode control with an application to a water tanks level system. Chapter 9 treats the mechanical aspect by showing the features of the fractional operators applied to this domain. Also, Chapter Nine presents the theory of diffusive stresses based on the fractional advection-diffusion equation. The modeling of drug diffusion during general anesthesia using Fractional Calculus is shown in Chapter 10 and is considered as another application related to the biomedical field. Finally, Chapter 11 represents an overview of the fractional fuzzy controllers by showing the analysis, the synthesis and the implementation of this module. To sum up, this second volume presents applications of fractional calculus in several engineering domains as the thermal, the automotive, the mechanical, the biomedical and much more. Note that this volume was preceded by a first volume that focuses on the mathematical and theoretical aspects of fractional calculus. (Imprint: Nova)

More information on this book can be found by the following link:
https://www.novapublishers.com/catalog/product_info.php?products_id=51947&osCsid=9e8d957fe8c4dbae3d13a362fa8e83b8

[Back]

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Journals

Applied Mathematics Letters

(selected)

Nontrivial solutions for a fractional advection dispersion equation in anomalous diffusion

Xinguang Zhang, Lishan Liu, Yonghong Wu, B. Wiwatanapataphee

Lyapunov-type inequalities for fractional partial differential equations

Mohamed Jleli, Mokhtar Kirane, Bessem Samet

Asymptotical stability of Riemann–Liouville fractional singular systems with multiple time-varying delays

Song Liu, Xian-Feng Zhou, Xiaoyan Li, Wei Jiang

Sharp estimates for the unique solution of two-point fractional-order boundary value problems

Bashir Ahmad

A note on fractional Duhamel's principle and its application to a class of fractional partial differential equations

Arjumand Seemab, Mujeeb ur Rehman

On numerical contour integral method for fractional diffusion equations with variable coefficients

Seakweng Vong, Pin Lyu

Fractional generalized Hamilton method for equilibrium stability of dynamical systems

Shao-Kai Luo, Jin-Man He, Yan-Li Xu, Xiao-Tian Zhang

On approximate solutions of some delayed fractional differential equations

Janusz Brzdęk, Nasrin Eghbali

Soliton solutions for fractional Schrödinger equations

Quanqing Li, Xian Wu

A note on terminal value problems for fractional differential equations on infinite interval

S.A. Hussain Shah, Mujeeb ur Rehman

[Back]

Fractional Calculus & Applied Analysis

(Vol. 19, No 6)

FRACTIONAL CALCULUS AND PATHWISE INTEGRATION FOR VOLTERRA PROCESSES DRIVEN BY LEVY AND MARTINGALE NOISE

G. Di Nunno, Y. Mishura, K. Ralchenko

ON THE SOLUTION OF TWO-SIDED FRACTIONAL ORDINARY DIFFERENTIAL EQUATIONS OF CAPUTO TYPE

Ma.E. Hernandez-Hernandez, V.N. Kolokoltsov

MODELING OF FINANCIAL PROCESSES WITH A SPACE-TIME FRACTIONAL DIFFUSION EQUATION OF VARYING ORDER

J. Korbel, Y. Luchko

FRACTIONAL-IN-TIME AND MULTIFRACTIONAL-IN-SPACE STOCHASTIC PARTIAL DIFFERENTIAL EQUATIONS

V.V. Anh, N.N. Leonenko, M.D. Ruiz-Medina

AN IDENTITY INVOLVING INTEGRATION WITH RESPECT TO VARIABLE ORDER OF FRACTIONAL DERIVATIVE

I. Matychyn

ON THE LAMPERTI TRANSFORM OF THE FRACTIONAL BROWNIAN SHEET

M. Khalil, C. Tudor, M. Zili

DENSITIES OF SCALING LIMITS OF COUPLED CONTINUOUS TIME RANDOM WALKS

M. Magdziarz, T. Zorawik

NONLOCAL PROBLEM FOR FRACTIONAL STOCHASTIC EVOLUTION EQUATIONS WITH SOLUTION OPERATORS

P. Chen, X. Zhang, Y. Li

NON-LINEAR NOISE EXCITATION FOR SOME SPACE-TIME FRACTIONAL STOCHASTIC EQUATIONS IN BOUNDED DOMAINS

M. Foondun, J.B. Mijena, E. Nane

TOO MUCH REGULARITY MAY FORCE TOO MUCH UNIQUENESS

M. Stynes

[Back]

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Paper Highlight

On a fractional Zener elastic wave equation

SP Näsholm，S Holm.

Publication information: FRACTIONAL CALCULUS AND APPLIED ANALYSIS Volume: 16 Issue: 1 Special Issue: SI Pages: 26-50 Published: MAR 2013

http://link.springer.com/article/10.2478/s13540-013-0003-1

Abstract

This survey concerns a causal elastic wave equation which implies frequency power-law attenuation. The wave equation can be derived from a fractional Zener stress-strain relation plus linearized conservation of mass and momentum. A connection between this four-parameter fractional wave equation and a physically well established multiple relaxation acoustical wave equation is reviewed. The fractional Zener wave equation implies three distinct attenuation power-law regimes and a continuous distribution of compressibility contributions which also has power-law regimes. Furthermore it is underlined that these wave equation considerations are tightly connected to the representation of the fractional Zener stress-strain relation, which includes the spring-pot viscoelastic element, and by a Maxwell-Wiechert model of conventional springs and dashpots. A purpose of the paper is to make available recently published results on fractional calculus modeling in the field of acoustics and elastography, with special focus on medical applications.

[Back]

Characterizing the creep of viscoelastic materials by fractal derivative models

Cai, Wei; Chen, Wen; Xu, Wenxiang

Publication information: INTERNATIONAL JOURNAL OF NON-LINEAR MECHANICS Volume: 87 Pages: 58-63 Published: DEC 2016

http://www.sciencedirect.com/science/article/pii/S0020746216302104

Abstract

In this paper, we make the first attempt to apply the fractal derivative to modeling viscoelastic behavior. The methodology of scaling transformation is utilized to obtain the creep modulus and relaxation compliance for the proposed fractal Maxwell and Kelvin models. Comparing with the fractional derivatives reported in the literature, the fractal derivative as a local operator has lower calculation costs and memory storage requirements. Moreover, numerical results show that the proposed fractal models require fewer parameters, have simpler mathematical expression and result in higher accuracy than the classical integer-order derivative models. Results further confirm that the proposed fractal models can characterize the creep behavior of viscoelastic materials.

[Back]

The End of This Issue