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◆ **Websites of Interest**

[Fractal derivative and operators with applications](#)

[Fractional Calculus & Applied Analysis](#)

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**Latest SCI Journal Papers on FDA**

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**(Searched on Oct 15, 2017)**

[A second order Crank-Nicolson scheme for fractional Cattaneo equation based on new fractional derivative](#)

By: Liu, Zhengguang; Cheng, Aijie; Li, Xiaoli

APPLIED MATHEMATICS AND COMPUTATION Volume: 311 Pages: 361-374 Published: OCT 15 2017

[Parameter estimation of the fractional-order Hammerstein-Wiener model using simplified refined instrumental variable fractional-order continuous time](#)

By: Allafi, Walid; Zajic, Ivan; Uddin, Kotub; et al.

IET CONTROL THEORY AND APPLICATIONS Volume: 11 Issue: 15 Pages: 2591-2598 Published: OCT 13 2017

[Linearized difference schemes for a BBM equation with a fractional nonlocal viscous term](#)

By: Li, Can

APPLIED MATHEMATICS AND COMPUTATION Volume: 311 Pages: 240-250 Published: OCT 15 2017

[A space-time fractional phase-field model with tunable sharpness and decay behavior and its efficient numerical simulation](#)

By: Li, Zheng; Wang, Hong; Yang, Danping

JOURNAL OF COMPUTATIONAL PHYSICS Volume: 347 Pages: 20-38 Published: OCT 15 2017

[Fourth-order numerical method for the space time tempered fractional diffusion-wave equation](#)

By: Dehghan, Mehdi; Abbaszadeh, Mostafa; Deng, Weihua

APPLIED MATHEMATICS LETTERS Volume: 73 Pages: 120-127 Published: NOV 2017

[Numerical simulation for solution of space-time fractional telegraphs equations with local fractional derivatives via HAFSTM](#)

By: Pandey, Rishi Kumar; Mishra, Hradyesh Kumar

NEW ASTRONOMY Volume: 57 Pages: 82-93 Published: NOV 2017

[Fractional Hopfield Neural Networks: Fractional Dynamic Associative Recurrent Neural Networks](#)

By: Pu, Yi-Fei; Yi, Zhang; Zhou, Ji-Liu

IEEE TRANSACTIONS ON NEURAL NETWORKS AND LEARNING SYSTEMS Volume: 28 Issue: 10 Pages: 2319-2333 Published: OCT 2017

[LMI Conditions for Global Stability of Fractional-Order Neural Networks](#)

By: Zhang, Shuo; Yu, Yongguang; Yu, Junzhi

IEEE TRANSACTIONS ON NEURAL NETWORKS AND LEARNING SYSTEMS Volume: 28 Issue: 10 Pages: 2423-2433 Published: OCT 2017

[A space-time fractional derivative model for European option pricing with transaction costs in fractal market](#)

By: Song, Lina

CHAOS SOLITONS & FRACTALS Volume: 103 Pages: 123-130 Published: OCT 2017

[Synchronization of fractional-order complex dynamical networks via periodically intermittent pinning control](#)

By: Li, Hong-Li; Hu, Cheng; Jiang, Haijun; et al.

CHAOS SOLITONS & FRACTALS Volume: 103 Pages: 357-363 Published: OCT 2017

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## Call for Papers

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**ICFDA'18 International Conference on Fractional Differentiation and its Applications**

<http://conferences.ju.edu.jo/en/icfda2018/Home.aspx>

### Description

The ICFDA'18 International Conference on Fractional Differentiation and its Applications is a specialized conference on fractional-order calculus and its applications. It is a generalization of the integer-order ones. The fractional-order differentiation of arbitrary orders takes into account the memory effect of most systems. The order of the derivatives may also be variable, distributed or complex. Recently, fractional-order calculus became a more accurate tool to describe systems in various fields in mathematics, biology, chemistry, medicine, mechanics, electricity, control

theory, economics, and signal and image processing.

Topics include, but are not limited to:

- Automatic Control;
- Biology;
- Electrical Engineering;
- Electronics;
- Electromagnetism;
- Electrochemistry;
- Finance and Economics;
- Fractional Earth Science
- Fractional Filters;
- Fractional Order Modeling and Control in Biomedical Engineering;
- Fractional Phase-Locked Loops;
- Fractional Variational Principles;
- Fractional Transforms and Their Applications;
- Fractional Wavelet Applications to the Composite Drug Signals;
- History of Fractional Calculus;
- Image Processing;
- Mathematical methods;
- Mechanics;
- Physics;
- Robotics;
- Signal Processing;
- Singularities Analysis and Integral Representations for Fractional Differential Systems;
- Special Functions Related to Fractional Calculus;
- Thermal Engineering;
- Viscoelasticity.

Prospective authors are invited to submit a full paper (4-6 pages) describing original work. Only electronic submissions will be accepted. Papers should include title, abstract, and topic category from the list above or related areas in standard IEEE or IFAC two-column format for consideration as lecture or poster. Both formats have the same value, and presentation method will be chosen for suitability.

All submissions should be made electronically through the 2018 conference website. Students are encouraged to participate on the best student paper award contest. Accepted papers will be published in the conference proceedings subject to advance registration of at least one of the authors.

Please note the following **important dates** related to ICFDA'18:

Submission of tutorials and special sessions proposals	February 15, 2018
Submission of regular and student papers	March 1, 2018
Notification of acceptance	May 2, 2018
Submission of camera-ready papers	May 25, 2018

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**The 3rd IFAC Conference on Advances in Proportional-Integral Derivative Control**

<http://www.pid18.ugent.be>

## **Description**

The 3rd IFAC Conference on Advances in Proportional-Integral Derivative Control (PID 2018) will be held Wednesday through Friday, May 9-11, at the Het Pand Convent and Meeting Centre in the heart of Ghent, Belgium – unanimously declared as the most pleasant city of Belgium. The

conference venue is near cultural heritage places, historical monuments, restaurants, shopping, and entertainment, just a walk to all of Ghent's known sights.

Proportional-Integral-Derivative (PID) controllers are undoubtedly the most employed controllers in industry. The PID 2018 is the sequel of PID 2000 in Terrassa, Spain and PID 2012 in Brescia, Italy. These last two meetings proved to be great successes and have given a significant impulse in research direction of PID controllers, as seen in the last decade in literature reports. The PID2018 conference is a timely and necessary event fueled by the challenges and perspectives of Industry 4.0 context and the renewed role of the PID controller in this new environment. In addition to provide the current state-of-art in the field, the meeting aims at providing a perspective of the future requirements for PID controllers within Industry 4.0.

The technical program will comprise several types of presentations in regular and invited sessions, tutorial sessions, and special sessions along with workshops and exhibits. This event will feature a parallel track on Internet Based control Education workshop (more details on conference website).

Topics: emphasis will be put on current challenges and new directions in PID control in the context of Industry 4.0. Below you can find a list of preferred topics, not limited to. Contributions with both theoretical and practical relevance are encouraged. Study cases from industry and challenges thereof are welcome.

PID tuning and automatic tuning methodologies

PID-based control structures

Applications of PID control

Industrial products for PID control design

Adaptive and robust

PID control Multivariable

PID control

Identification methods for PID control design

Stabilizing PID parameters

Event-based PID control

Fractional-order PID controllers

PID control performance assessment

Control education

CACSD tools for PID control design

Fault detection techniques for PID control

Nonlinear PID control

Simple alternatives to PID controllers

**Important Dates:**

**Initial paper:** 20 December 2017

**Final Paper and Registration:** 01 March 2018

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**[Books](#)**

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## Fractional-order Modeling and Control of Dynamic Systems

Aleksei Teplyakov

### Book Description

This book reports on an outstanding research devoted to modeling and control of dynamic systems using fractional-order calculus. It describes the development of model-based control design methods for systems described by fractional dynamic models. More than 300 years had passed since Newton and Leibniz developed a set of mathematical tools we now know as calculus. Ever since then the idea of non-integer derivatives and integrals, universally referred to as fractional calculus, has been of interest to many researchers. However, due to various issues, the usage of fractional-order models in real-life applications was limited. Advances in modern computer science made it possible to apply efficient numerical methods to the computation of fractional derivatives and integrals. This book describes novel methods developed by the author for fractional modeling and control, together with their successful application in real-world process control scenarios.

More information on this book can be found by the following links:

<https://link.springer.com/book/10.1007/978-3-319-52950-9>

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## Fractal Elements and their Applications

Anis Kharisovich Gil'mutdinov, Pyotr Arkhipovich Ushakov, Reyad El-Khazali

### Book Description

This book describes a new type of passive electronic components, called fractal elements, from a theoretical and practical point of view. The authors discuss in detail the physical implementation and design of fractal devices for application in fractional-order signal processing and systems. The concepts of fractals and fractal signals are explained, as well as the fundamentals of fractional calculus. Several implementations of fractional impedances are discussed, along with comparison of their performance characteristics. Details of design, schematics, fundamental techniques and implementation of RC-based fractal elements are provided.

More information on this book can be found by the following links:

<https://link.springer.com/book/10.1007%2F978-3-319-45249-4#about>

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## Journals

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### Chinese Journal of Physics

(Selected)

[A new generalized fractional Maxwell model of dielectric relaxation](#)

Dan Luo, Hong-Shan Chen

[Fractional physical differential equations via natural transform](#)

Sad Rida, Anas Arafat, Ahmed Abedl-Rady, Hamdy Abdl-Rahaim

[Stochastic resonance for a fractional linear oscillator with two-kinds of fractional-order derivatives subject to multiplicative and signal-modulated noise](#)

Jianqu Zhu, Weidong Jin, Feng Guo

[Influence of time-fractional derivatives on the boundary layer flow of Maxwell fluids](#)

Yasir Mahsud, Nehad Ali Shah, Dumitru Vieru

[Vibrational resonance in fractional-order overdamped multistable systems](#)

Tianqi Qin, Tianting Xie, Maokang Luo, Ke Deng

[Soliton solutions for the space-time nonlinear partial differential equations with fractional-orders](#)

Jin Hyuk Choi, Hyunsoo Kim

[A microscopic study of MHD fractional inertial flow through Forchheimer medium](#)

Muhammad Shoaib Anwar, Amer Rasheed

[Synchronization of uncertain fractional-order chaotic systems via a novel adaptive controller](#)

Runzi Luo, Haipeng Su, Yanhui Zeng

[Stability analysis, chaos control of a fractional order chaotic chemical reactor system and its function projective synchronization with parametric uncertainties](#)

Vijay K. Yadav, Subir Das, Beer Singh Bhadauria, Ashok K. Singh, Mayank Srivastava

[On certain exact solutions of diffusive predator-prey system of fractional order](#)

Jin Hyuk Choi, Hyunsoo Kim, Rathinasamy Sakthivel

[Stochastic resonance in a fractional linear oscillator subject to random viscous damping and signal-modulated noise](#)

Zhi-Qi Huang, Feng Guo

[On the dynamics, existence of chaos, control and synchronization of a novel complex chaotic system](#)

K. Vishal, Saurabh K. Agrawal

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## **International Journal of Solids and Structure**

(Selected)

[A hyperelastic fractional damage material model with memory](#)

Wojciech Sumelka, George Z. Voyiadjis

[Fractional order plasticity model for granular soils subjected to monotonic triaxial compression](#)

Yifei Sun, Yang Xiao

[Fractional visco-elastic Euler–Bernoulli beam](#)

M. Di Paola, R. Heuer, A. Pirrotta

[Free energy and states of fractional-order hereditariness](#)

Luca Deseri, Mario Di Paola, Massimiliano Zingales

[Lattice with long-range interaction of power-law type for fractional non-local elasticity](#)

Vasily E. Tarasov

[Fractional order theory of thermoelasticity](#)

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## Paper Highlight

### A FRACTIONAL MODEL FOR TIME-VARIANT NON-NEWTONIAN FLOW

Yang, Xu; Chen, Wen; Xiao, Rui; et al.

**Publication information:** THERMAL SCIENCE Volume: 21 Issue: 1 Pages: 61-68 Part: A Published: 2017

<http://thermalscience.vinca.rs/2017/1/7>

#### Abstract

This work applies a fractional flow model to describe a time-variant behavior of non-Newtonian substances. Specifically, we model the physical mechanism underlying the thixotropic and anti-thixotropic phenomena of non-Newtonian flow. This study investigates the behaviors of cellulose suspensions and SMS pastes under constant shear rate. The results imply that the presented model with only two parameters is adequate to fit experimental data. Moreover, the parameter of fractional order is an appropriate index to characterize the state of given substances. Its value indicates the extent of thixotropy and anti-thixotropy with positive and negative order respectively.

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### CONTROLLABILITY OF NONLINEAR FRACTIONAL DELAY DYNAMICAL SYSTEMS

RJ Nirmala; K Balachandran; L Rodríguez-Germa; JJ Trujillo

**Publication information:** REPORTS ON MATHEMATICAL PHYSICS Volume: 77 Issue: 1 Pages: 87-104 Published: FEB 2016

<http://www.sciencedirect.com/science/article/pii/S0034487716300076>

#### Abstract

This paper is concerned with controllability of nonlinear fractional delay dynamical systems with delay in state variables. The solution representations of fractional delay differential equations have been established by using the Laplace transform technique and the Mittag—Leffler function. Necessary and sufficient conditions for the controllability criteria of linear fractional delay systems are established. Further sufficient condition for the controllability of nonlinear fractional delay dynamical system are obtained by using the fixed point argument. Examples and numerical simulation are presented to illustrate the results.

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The End of This Issue

