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◆ Latest SCI Journal Papers on FDA

[\(Searched on 28th October 2013\)](#)

◆ Call for papers

[Call for papers: Special Session in Numerical Analysis at ICFDA 2014](#)

◆ Books

[Elements of Random Walk and Diffusion Processes](#)

[Limits, Series, and Fractional Part Integrals: Problems in Mathematical Analysis](#)

◆ Journals

[Special Issue of The European Physical Journal Special Topics on Dynamics of Fractional Partial](#)

[Differential Equations](#)

[Fractional Calculus and Applied Analysis](#)

◆ Paper Highlight

[Universal fractional map and cascade of bifurcations type attractors](#)

[Solution set for fractional differential equations with Riemann-Liouville derivative](#)

◆ Websites of Interest

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Latest SCI Journal Papers on FDA

(Searched on 28th October 2013)

Title: [Fractional differential equations and related exact mechanical models](#)

Author(s): Di Paola, Mario; Pinnola, Francesco Paolo; Zingales, Massimiliano

Source: COMPUTERS & MATHEMATICS WITH APPLICATIONS Volume: **66** Issue: **5** Pages: **608-620** DOI: **10.1016/j.camwa.2013.03.012** Published: **SEP 2013**

Title: [Fractional-order \(PID \$\mu\$ \)-D- \$\lambda\$ controller design](#)

Author(s): El-Khazali, Reyad

Source: COMPUTERS & MATHEMATICS WITH APPLICATIONS Volume: **66** Issue: **5** Pages: **639-646** DOI: **10.1016/j.camwa.2013.02.015** Published: **SEP 2013**

Title: [Fractional Sturm-Liouville problem](#)

Author(s): Klimek, M.; Agrawal, O. P.

Source: COMPUTERS & MATHEMATICS WITH APPLICATIONS Volume: **66** Issue: **5** Pages: **795-812** DOI: **10.1016/j.camwa.2012.12.011** Published: **SEP 2013**

Title: [Dynamic analysis of frame structures with free viscoelastic layers: New closed-form solutions of eigenvalues and a viscous approach](#)

Author(s): Lazaro, Mario; Perez-aparicio, Jose L.

Source: ENGINEERING STRUCTURES Volume: **54** Pages: **69-81** DOI: **10.1016/j.engstruct.2013.03.052** Published: **SEP 2013**

Title: [On a fractional differential inclusion with integral boundary conditions in Banach space](#)

Author(s): Phan Dinh Phung; Le Xuan Truong

Source: FRACTIONAL CALCULUS AND APPLIED ANALYSIS Volume: **16** Issue: **3** Pages: **538-558** DOI: **10.2478/s13540-013-0035-6** Published: **SEP 2013**

Title: [Existence of positive solutions to a higher order singular boundary value problem with fractional \$q\$ -derivatives](#)

Author(s): Graef, John R.; Kong, Lingju

Source: FRACTIONAL CALCULUS AND APPLIED ANALYSIS Volume: **16** Issue: **3** Pages: **695-708** DOI: **10.2478/s13540-013-0044-5** Published: **SEP 2013**

Title: [Existence results for coupled systems of quadratic integral equations of fractional orders](#)

Author(s): El-Sayed, A. M. A.; Hashem, H. H. G.

Source: OPTIMIZATION LETTERS Volume: **7** Issue: **6** Pages: **1251-1260** DOI: **10.1007/s11590-012-0501-9** Published: **AUG 2013**

[\[Back\]](#)

Call for papers

Call for papers: Special Session in Numerical Analysis at ICFDA 2014, Catania June 23-25, 2014

(Contributed by Prof. Roberto Garrappa)

A special session dedicated to numerical aspects is organized. The aim of this session, titled "Innovative methods for differential equations of fractional order", is to discuss and stimulate innovative ideas in the numerical treatment of fractional order problems and encourage their spread into other applicative fields. The topic of the session includes also the numerical treatment of partial differential equations with time-fractional and/or space-fractional derivatives.

The deadline for abstract submission is December 1st, 2013. Please, visit the conference web page <http://www.icfda14.dieei.unict.it/> for further information.

If you intend to present a talk in this session, please contact me at one of the following e-mail addresses roberto.garrappa@uniba.it or r.garrappa@gmail.com, where answers to specific questions can also be requested.

Thank you for your interest in this session.

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[\[Back\]](#)

Books

Elements of Random Walk and Diffusion Processes

(Wiley Series in Operations Research and Management Science)

Oliver C. Ibe

Book Description

Random walk is a stochastic process that has proven to be a useful model in understanding discrete-state discrete-time processes across a wide spectrum of scientific disciplines. *Elements of Random Walk and Diffusion Processes* provides an interdisciplinary approach by including numerous practical examples and exercises with real-world applications in operations research, economics, engineering, and physics.

Featuring an introduction to powerful and general techniques that are used in the application of physical and dynamic processes, the book presents the connections between diffusion equations and random motion. Standard methods and applications of Brownian motion are addressed in addition to Levy motion, which has become popular in random searches in a variety of fields. The book also covers fractional calculus and introduces percolation theory and its relationship to diffusion processes.

With a strong emphasis on the relationship between random walk theory and diffusion processes, *Elements of Random Walk and Diffusion Processes* features:

- Basic concepts in probability, an overview of stochastic and fractional processes, and elements of graph theory
- Numerous practical applications of random walk across various disciplines, including how to model stock prices and gambling, describe the statistical properties of genetic drift, and simplify the random movement of molecules in liquids and gases
- Examples of the real-world applicability of random walk such as node movement and node failure in wireless networking, the size of the Web in computer science, and polymers in physics
- Plentiful examples and exercises throughout that illustrate the solution of many practical problems

Elements of Random Walk and Diffusion Processes is an ideal reference for researchers and professionals involved in operations research, economics, engineering, mathematics, and physics. The book is also an excellent textbook for upper-undergraduate and graduate level courses in probability and stochastic processes, stochastic models, random motion and Brownian theory, random walk theory, and diffusion process techniques.

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

<http://as.wiley.com/WileyCDA/WileyTitle/productCd-1118618092.html>

[\[Back\]](#)

Limits, Series, and Fractional Part Integrals: Problems in Mathematical Analysis

(Problem Books in Mathematics)

Ovidiu Furdui

Book Description

This book features challenging problems of classical analysis that invite the reader to explore a host of strategies and tools used for solving problems of modern topics in real analysis. This volume offers an unusual collection of problems — many of them original — specializing in three topics of mathematical analysis: limits, series, and fractional part integrals. The work is divided into three parts, each containing a chapter dealing with a particular problem type as well as a very short section of hints to select problems. The first chapter collects problems on limits of special sequences and Riemann integrals; the second chapter focuses on the calculation of fractional part integrals with a special section called ‘Quickies’ which contains problems that have had unexpected succinct solutions. The final chapter offers the reader an assortment of problems with a flavor towards the computational aspects of infinite series and special products, many of which are new to the literature. Each chapter contains a section of difficult problems which are motivated by other problems in the book. These ‘Open Problems’ may be considered research projects for students who are studying advanced calculus, and which are intended to stimulate creativity and the discovery of new and original methods for proving known results and establishing new ones. This stimulating collection of problems is intended for undergraduate students with a strong background in analysis; graduate students in mathematics, physics, and engineering; researchers; and anyone who works on topics at the crossroad between pure and applied mathematics. Moreover, the level of problems is appropriate for students involved in the Putnam competition and other high level mathematical contests.

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

<http://www.springer.com/mathematics/analysis/book/978-1-4614-6761-8>

[\[Back\]](#)

Journals

Special Issue of The European Physical Journal Special Topics on Dynamics of Fractional Partial Differential Equations

Volume 222, Issue 8, September 2013

(Contributed by Yong Zhou)

Editorial

[Editorial](#)

Yong Zhou, Vasily E. Tarasov, J. J. Trujillo, R. Garrappa Pages 1745-1748

Regular Article

[Cauchy problem for fractional evolution equations with Caputo derivative](#)

[Y. Zhou](#), [X. H. Shen](#), [L. Zhang](#) Pages 1749-1765

Regular Article

[Axisymmetric solutions to fractional diffusion-wave equation in a cylinder under Robin boundary condition](#)

[Y. Povstenko](#) Pages 1767-1777

Regular Article

[Comments on employing the Riesz-Feller derivative in the Schrödinger equation](#)

[B. Al-Saqabi](#), [L. Boyadjiev](#), [Yu. Luchko](#) Pages 1779-1794

Review

[A fractional approach to the Fermi-Pasta-Ulam problem](#)

[J. A. T. Machado](#) Pages 1795-1803

Regular Article

[Derivation of a fractional Boussinesq equation for modelling unconfined groundwater](#)

[B. Mehdinejadani](#), [H. Jafari](#), [D. Baleanu](#) Pages 1805-1812

Regular Article

[Fractional calculus of variations of several independent variables](#)

[T. Odziejewicz](#), [A. B. Malinowska](#), [D. F. M. Torres](#) Pages 1813-1826

Review

[Fractional calculus: A survey of useful formulas](#)

[D. Valério](#), [J. J. Trujillo](#), [M. Rivero](#), [J. A. T. Machado](#), [D. Baleanu](#) Pages 1827-1846

Regular Article

[Fractional Fokker-Planck equation for anomalous diffusion in a potential: Exact matrix continued fraction solutions](#)

[W. T. Coffey](#), [Y. P. Kalmykov](#), [S. V. Titov](#) Pages 1847-1856

Regular Article

[Presentation of solutions of impulsive fractional Langevin equations and existence results](#)

[J. Wang](#), [M. Feckan](#), [Y. Zhou](#) Pages 1857-1874

Regular Article

[Fractional kinetics of glioma treatment by a radio-frequency electric field](#)

[A. Iomin](#) Pages 1875-1884

Regular Article

[High-order explicit-implicit numerical methods for nonlinear anomalous diffusion equations](#)

[F. Zeng](#), [C. Li](#), [F. Liu](#) Pages 1885-1900

Regular Article

[Series expansion solutions for the multi-term time and space fractional partial differential equations in two- and three-dimensions](#)

[H. Ye](#), [F. Liu](#), [I. Turner](#), [V. Anh](#), [K. Burrage](#) Pages 1901-1914

Regular Article

[Exponential integrators for time-fractional partial differential equations](#)

[R. Garrappa](#) Pages 1915-1927

Review

[Generalized classical mechanics](#)

[N. Laskin](#) Pages 1929-1938

Regular Article

[Multi-time fractional diffusion equation](#)

[A. V. Pskhu](#) Pages 1939-1950

Regular Article

[Acoustic-elastodynamic interaction in isotropic fractal media](#)

[H. Joumaa](#), [M. Ostoj-Starzewski](#) Pages 1951-1960

Regular Article

[Numerical method for two dimensional fractional reaction subdiffusion equation](#)

[H. Huang, X. Cao](#) Pages 1961-1973

Regular Article

[A matrix approach for partial differential equations with Riesz space fractional derivatives](#)

[M. Popolizio](#) Pages 1975-1985

Regular Article

[A finite difference method with non-uniform timesteps for fractional diffusion and diffusion-wave equations](#)

[J. Quintana-Murillo, S. B. Yuste](#) Pages 1987-1998

[\[Back\]](#)

Fractional Calculus and Applied Analysis

Volume 16, Issue 3

[FCAA related news, events and books \(FCAA-volume 16-3-2013\)](#)

Virginia Kiryakova

[Chaos in a fractional order logistic map](#)

Joakim Munkhammar

[Effects of the temperature variation on the behavior of the first order crone system realized in the electrical domain](#)

Roy Abi Zeid Daou, Xavier Moreau

[On a fractional differential inclusion with integral boundary conditions in Banach space](#)

Phan Dinh Phung, Le Xuan Truong

[A note on fractional Bessel equation and its asymptotics](#)

Wojciech Okrański, Łukasz Płociniczak

[Waveform relaxation methods for fractional functional differential equations](#)

Xiao-Li Ding, Yao-Lin Jiang

[Existence of solutions to initial value problems for nonlinear fractional differential equations on the semi-axis](#)

Tiberiu Trif

[On the asymptotic stability of linear system of fractional-order difference equations](#)

Raghib Abu-Saris, Qasem Al-Mdallal

[Liouville and Riemann-Liouville fractional derivatives via contour integrals](#)

Tohru Morita, Ken-ichi Sato

[A parallel algorithm for the Riesz fractional reaction-diffusion equation with explicit finite difference method](#)

Chunye Gong, Weimin Bao, Guojian Tang

[Fractional integration toolbox](#)

Toma M. Marinov, Nelson Ramirez

[Solution set for fractional differential equations with Riemann-Liouville derivative](#)

Yurilev Chalco-Cano, Juan J. Nieto

[Existence of positive solutions to a higher order singular boundary value problem with fractional q-derivatives](#)

John R. Graef, Lingju Kong

[Numerical solutions and analysis of diffusion for new generalized fractional Burgers equation](#)

Yufeng Xu, Om P. Agrawal

[Fractional adsorption diffusion](#)

Gerd Baumann, Frank Stenger

[\[Back\]](#)

Paper Highlight

Universal fractional map and cascade of bifurcations type attractors

M. Edelman

Publication information: M. Edelman. Universal fractional map and cascade of bifurcations type attractors. Chaos 23, 033127 (2013).

<http://dx.doi.org/10.1063/1.4819165>

Abstract

We modified the way in which the Universal Map is obtained in the regular dynamics to derive the Universal α -Family of Maps depending on a single parameter $\alpha > 0$, which is the order of the fractional derivative in the nonlinear fractional differential equation describing a system experiencing periodic kicks. We consider two particular α -families corresponding to the Standard and Logistic Maps. For fractional $\alpha < 2$ in the area of parameter values of the transition through the period doubling cascade of bifurcations from regular to chaotic motion in regular dynamics corresponding fractional systems demonstrate a new type of attractors—cascade of bifurcations type trajectories.

[\[Back\]](#)

Solution set for fractional differential equations with Riemann-Liouville derivative

Yurilev Chalco-Cano, Juan J. Nieto, Abdelghani Ouahab, Heriberto Román-Flores

Publication information: Yurilev Chalco-Cano, Juan J. Nieto, Abdelghani Ouahab, Heriberto Román-Flores. Solution set for fractional differential equations with Riemann-Liouville derivative. Fractional Calculus and Applied Analysis, 2013, 16 (3), 682-694.

<http://link.springer.com/article/10.2478/s13540-013-0043-6>

Abstract

We study an initial value problem for a fractional differential equation using the Riemann-Liouville fractional derivative. We obtain some topological properties of the solution set: It is the intersection of a decreasing sequence of compact nonempty contractible spaces. We extend the classical Kneser's theorem on the structure solution set for ordinary differential equations.

[\[Back\]](#)

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The End of This Issue

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