Fractional Calculus & Applied Analysis

An International Journal for Theory and Applications

VOLUME 18, NUMBER 4 (2015)

(Print) ISSN 1311-0454
(Electronic) ISSN 1314-2224

EDITORIAL

FCAA RELATED NEWS, EVENTS AND BOOKS (FCAA–VOLUME 18–4–2015)

Virginia Kiryakova

Dear readers,

in the Editorial Notes we announce news for our journal, anniversaries, information on international meetings, events, new books, etc. related to the FCAA (“Fractional Calculus and Applied Analysis”) areas.

1. Review on New Book

Dumitru Baleanu, Octavian G Mustafa, *Asymptotic Integration and Stability: For Ordinary, Functional and Discrete Differential Equations of Fractional Order*. World Scientific Publishing Co., Series on Complexity, Nonlinearity and Chaos: Volume 4, March 2015, 208 pp., N. Jersey - London - Singapore - etc., ISBN: 978-981-4641-09-8 (hardcover), ISBN: 978-981-4641-11-1 (ebook).

Details at:

<http://www.worldscientific.com/worldscibooks/10.1142/9413>

Contents:

- The Differential Operators of Order $1+\alpha$ and Their Integral Counterparts;
- Existence and Uniqueness of Solution for the Differential Equations of Order α ;
- Position of the Zeros, the Bihari Inequality, and the Asymptotic Behavior of Solutions for the Differential Equations of Order α ;
- Asymptotic Integration for the Differential Equations of Order $1+\alpha$;
- Existence and Uniqueness of Solution for Some Delay Differential Equations with Caputo Derivatives;
- Existence of Positive Solutions for Some Delay Fractional Differential Equations with a Generalized N -Term;
- Stability of a Class of Discrete Fractional Nonautonomous Systems;
- Mittag-Leffler Stability for Fractional Nonlinear Systems with Delay;
- Razumikhin Stability for Fractional Systems in the Presence of Delay;
- Controllability of Some Fractional Evolution Nonlocal Impulsive Quasilinear Delay Integro-Differential Systems;
- Approximate Controllability of Sobolev Type Nonlocal Fractional Stochastic Dynamic Systems in Hilbert Spaces.

Readership: Researchers and PhD students in mathematics, physics and applied sciences whose interests involve differential equations, fractional calculus, special functions, variational methods and their applications in physics, mechanics, engineering, economics, life sciences and social sciences.

Review on the Book:

Fractional Calculus is a fundamental tool to describe the study of anomalous social and physical behaviour, where a scaling power law of fractional order appears often in the corresponding experiments supporting the description of such complex phenomena.

During the last years, the asymptotic integration and stability of fractional order differential equations became one of the important research directions in the field of fractional calculus and its applications. Therefore, this book will be useful for researchers who would like to have a solid background on the asymptotic integration and stability of fractional differential equations and their applications.

The book presents new results, within the fast developing area of fractional differential equations, on existence, multiplicity and uniqueness of their solutions. Also there are pointed out some recent results on asymptotic and stability of the solutions. Besides, some new results concerning the Mittag-Leffler and Razumikhin stability are reported. The Lyapunov method for discrete fractional non autonomous systems is presented. In this way, many of the classical related theorems are generalized to the fractional order case and also the authors present direct implications of them in the description of several fractional dynamics of complex systems. Also the fractional controllability and approximate controllability concepts' have been discussed by taking into account that they represent fundamental concepts in mathematical control theory and play a powerful role in deterministic and stochastic control of systems.

This new and interesting book contains 11 chapters.

The first chapter is about the differential operators of order $1+\alpha$ and their integral counterparts. The chapter starts, in an original way, to introduce some of the basic concepts of fractional calculus. The style of writing the book is different than the standard one which can be seen in most of the monographs. The second chapter is devoted to the existence and uniqueness of solutions for the considered differential equations. The core of the chapter concerns the Nagumo-like uniqueness criterion for the fractional differential equations within the frames of the Riemann-Liouville derivative. Also, the Lovelady-Martin uniqueness result and Wintner type existence interval for an initial value problem within Caputo derivative are treated. The third chapter presents the Fite-type length criterion for fractional disconjugacy and the Bihari inequality. Also it contains results on asymptotic integration of the fractional differential equations of order $1+\alpha$ and the Bihari asymptotic integration theory for the differential equations of second order. Chapter 4 is devoted to the asymptotic integration for

the differential equations of order α . Again, in an original style, new results are illustrated in a pedagogical way. Also the readers can find some original results on asymptotic integration theory of Trench type, asymptotically linear solutions, convergent solutions, Bihari-like results and L^p solutions of fractional order equations. Chapters 5 and 6 are devoted to the existence of solutions of fractional differential equations in the presence of delay. Chapter 7 debates new results about the stability of discrete fractional nonautonomous systems. Chapters 8 and 9 are dealing with the important concepts of the Mittag-Leffler and Razumikhin stability for fractional systems with delay. Chapter 10 is concentrated on controllability of some fractional nonlocal impulsive quasilinear delay integro-differential systems. The last Chapter 11 illustrates the approximate controllability of Sobolev type for nonlocal fractional stochastic dynamic systems in Hilbert spaces.

All topics presented in this well written book are new and of great interest for the young researchers in the field of fractional calculus and its applications.

Juan J. Trujillo

Dept. Math. Analysis, University of La Laguna, SPAIN

2. New Books

Said Abbas, Mouffak Benchohra and Gaston Mandata N'Guérékata, *Advanced Fractional Differential and Integral Equations*. Nova Science Publishers, Series: Mathematics Research Developments, 2014, 377 pp., ISBN: 978-1-63463-109-9.

Details at: https://www.novapublishers.com/catalog/product_info.php?cPath=23_49&products_id=51752&osCsid=72336a5289ad01c0ca3342dd7ea5b5b7

Book Description: Fractional calculus deals with extensions of derivatives and integrals to non-integer orders. It represents a powerful tool in applied mathematics to study a myriad of problems from different fields of science and engineering, with many break-through results found in mathematical physics, finance, hydrology, biophysics, thermodynamics, control theory, statistical mechanics, astrophysics, cosmology and bioengineering. This book is devoted to the existence and uniqueness of solutions and some Ulam's type stability concepts for various classes of functional differential and integral equations of fractional order. Some equations present delay which may be finite, infinite or state-dependent. Others are subject to multiple time delay effect. The tools used include classical fixed point theorems. Other tools are based on the measure of non-compactness together with appropriate fixed point theorems. Each chapter concludes with a

section devoted to notes and bibliographical remarks and all the presented results are illustrated by examples. The content of the book is new and complements the existing literature in Fractional Calculus. It is useful for researchers and graduate students for research, seminars and advanced graduate courses, in pure and applied mathematics, engineering, biology and other applied sciences.

Table of Contents: • Introduction; • Chapter 1: Preliminary Background; • Chapter 2: Nonlinear Differential Equations of Fractional Order; • Chapter 3: Fractional Order Riemann-Liouville Integral Equations; • Chapter 4: Fractional Order Riemann-Liouville Volterra-Stieltjes Quadratic Integral Equations; • Chapter 5: Fractional Order Riemann-Liouville Volterra-Stieltjes Quadratic Delay Integral Equations; • Chapter 6: Fractional Order Riemann-Liouville Integro-Differential Equations; • Chapter 7: Fractional Order Riemann-Liouville Delay Integro-Differential Equations; • Chapter 8: Abstract Integral Equations; • Chapter 9: Abstract Integro-Differential Equations; • Chapter 10: Abstract Integro-Differential Inclusions; • Chapter 11: Weak Solutions for Nonlinear Fractional Differential Equations; • Chapter 12: Weak Solutions for Nonlinear Fractional Differential Inclusions; • Chapter 13: Ulam Stabilities for the Darboux Problem for Partial Fractional Differential Equations and Inclusions; • Appendix; • References.

3. Call for Papers

Information sent by YangQuan Chen:

1) A Special Issue in “**International Journal of Control**”,
<https://mc.manuscriptcentral.com/tcon>, Editor-in-Chief: Prof. Eric Rogers.

The Special Issue Title is “**Applied Fractional Calculus in Modeling, Analysis and Design of Control Systems**”.

Guest Editors:

Prof. Dr. YangQuan Chen, USA,

e-mail: yqchen@ieee.org, or, yangquan.chen@ucmerced.edu;

Dr. Clara M. Ionescu, Belgium,

e-mail: ClaraMihaela.Ionescu@UGent.be.

Important Dates (tentative): Paper Submission: 1 June 2015; First Review: 1 Aug. 2015; Paper Acceptance: 1 Oct. 2015; Publication online: 1 Dec. 2015.

Submission Guidelines: Potential authors need to upload the electronic file of the manuscript through the journal’s online submission website: <https://mc.manuscriptcentral.com/tcon>, pls. select the item: fracspe on the drop-down menu when you submit papers. These should be written and submitted according to the International Journal of Control guidelines.

2) A Special Issue in “*IEEE/CAA Journal of Automatica Sinica*”, <https://mc03.manuscriptcentral.com/aas-en>, Editor-in-Chief: Prof. Fei-Yue Wang.

Special Issue Title: “**Fractional Order Systems and Controls**”.

Guest Co-Editors:

Prof. YangQuan Chen, USA,

e-mail: yqchen@ieee.org, or, yangquan.chen@ucmerced.edu;

Prof. Dingyu Xue, China, e-mail: xuedingyu@ise.neu.edu.cn;

Prof. Antonio Visioli, Italy, e-mail: antonio.visioli@ing.unibs.it.

Important Dates (tentative): Paper Submission: 31 Aug. 2015; First Review: 31 Oct. 2015; Paper Acceptance: 30 Nov. 2015; Publication online: Issue #1 of 2016.

Submission Guidelines: Potential authors need to upload the electronic file of the manuscript through the journal’s online submission website: <https://mc03.manuscriptcentral.com/aas-en>, pls. select the special issue item on the drop-down menu when you submit papers. These should be written in English and submitted according to the IEEE/CAA Journal of Automatica Sinica guidelines.

Information sent by Hans Haubold:

A Special Issue in the journal “*Axioms*”, website:

http://www.mdpi.com/journal/axioms/special_issues/special_functions-fractional_calculus.

The Special Issue Title is: “*Special Functions: Fractional Calculus and the Pathway for Entropy Dedicated to Professor Dr. A.M. Mathai at the occasion of his 80th Birthday*”.

Information on Prof. A.M. Mathai’s vita and scientific contributions can be found in above mentioned website, as well as in the recent paper: *Axioms*, vol. 4, No 3 (2015), 213-234; doi:10.3390/axioms4030213; <http://www.mdpi.com/2075-1680/4/3/213>.

Guest Editor: Prof. Dr. Hans J. Haubold, Austria - India.

Submission: Manuscripts should be submitted online at <http://www.mdpi.com>, by registering and logging in to this website.

Deadline: October 28, 2015.

Information sent by H.M. Srivastava:

In addition to the call for papers in two other special journals’ issues, announced by him in Editorial Note of FCAA-18-3-2015, the following additional calls have been sent:

1) Journal “*Advances in Pure Mathematics*”, Website and details: [http://www.scirp.org/journal/htmlOfSpecialIssue.aspx?](http://www.scirp.org/journal/htmlOfSpecialIssue.aspx?ID=2016&JournalID=513)

ID=2016&JournalID=513.

The Special Issue Title is: “**Fractional Differential, Integral and Integro-Differential Equations Research**”.

Guest Co-Editor: Prof. Dr. Hari M. Srivastava.

2) “*Electronic Journal of Mathematics and Its Application*” (EJMIA), Website: <http://www.ejmia.in>.

This will be Special Issue: Vol. 1, No. 2, 2015, **Dedicated to Professor Hari M. Srivastava on his 75th Birth Anniversary**.

For further details, please contact the Editors of EJMIA:

Dr. K. K. Dixit, e-mail: kk.dixit@rediffmail.com;

Dr. Saurabh Porwal, e-mail: saurabhjcb@rediffmail.com.

4. 75th Anniversary of Professor H.M. Srivastava

Professor Hari Mohan Srivastava was born on 5th July 1940 at Karon in District Ballia of the Province of Uttar Pradesh in India, and is celebrating now his 75th anniversary. Professor Emeritus - Dept. of Mathematics and Statistics, University of Victoria, British Columbia - Canada. He is acting as Editor, Honorary Editor, Associate or Senior Editor, or Editorial Board Member at more than 200 international scientific research journals. Among them is our journal “*Fractional Calculus and Applied Analysis*” (**FCAA**), **as a Honorary editor**. Several special issues of the FCAA journal: Vol. 3, No 3 (2000), 319-326; Vol. 8, No 4 (2005), 387-392; Vol. 13, No 3 (2010), 342; Vol. 13, No 4 (2010), 347-352 (Guest Eds. V. Kiryakova and Sh. Owa), were dedicated to his anniversaries and contained also detailed biographical data for Prof. H.M. Srivastava, list of his publications, etc.

Prof. Srivastava is well known expert in the FCAA and other topics, has authored a long list of books and edited volumes; book and encyclopedia chapters; papers in international conference proceedings and more than 1000 scientific journal articles. For details, please visit his Web sites

<http://www.math.uvic.ca/faculty/harimsri/>,

<http://degruyteropen.com/people/srivastava/>.

Several journals have recently special issues dedicated to Prof. Srivastava anniversary, and surveys on his vita and contributions, as: I.N. Cangül, Professor H. M. Srivastava: Man and mathematician, In: *J. of Inequalities and Applications* **2013** (2013), # 413; doi:10.1186/1029-242X-2013-413; <http://www.journalofinequalitiesandapplications.com/content/2013/1/413>.

On behalf of Editorial board of FCAA, we like to wish Prof. Srivastava and his wife Rekha, many happy returns and continued enthusiasm.

*Institute of Mathematics and Informatics, Bulgarian Academy of Sciences
Acad. G. Bontchev Str., Block 8, Sofia 1113 – BULGARIA
e-mail: virginia@diogenes.bg*