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Abstract Book

3rd INTERNATIONAL CONFERENCE ON RECENT ADVANCES IN PURE AND APPLIED MATHEMATICS, (ICRAPAM 2016)

Istanbul Commerce University, Istanbul Medeniyet University

Institute of Mathematics of National Academy of Science of Ukraine

19-23 MAY 2016

BODRUM, TURKEY

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Dear Collogues;

First of all I wish to offer you a warm welcome to the third International Conference on Recent Advances in Pure and Applied Mathematics (ICRAPAM 2016).

The last conference of this series was organized in Istanbul, Turkey, during 03-06 June 2015 and it was attended by 400 scientists from 48 different countries, contributing 360 oral presentations and 39 posters.

As the past conference, the aim of this conference is to provide a platform for mathematicians to present their recent Works, exchange ideas and new methods in several important areas of Mathematics and to provide an opportunity to improve collaboration between local and international participants in the wonderful historic city of Istanbul. Further we believe that, the development in various fields of Mathematics lead to new research areas in Mathematics and the richness of the new results can also provide basis for interdisciplinary collaborations. That is why; we have planned to provide a common forum for scientists to communicate their original results in various fields of analysis and applied mathematics.

The conference is supported by Istanbul Commerce University and Istanbul Medeniyet University from Turkey, and Institute of Mathematics of National Academy of Science of Ukraine.

We also like to thank all the invited speakers who have kindly accepted our invitation and have come to spend their precious time by sharing their ideas during the conference. Finally, we would also like to thank all of the members of the Scientific Advisory Committee and the Organizing Committee of this conference.

Again we would like to convey our heartiest welcome to each of you who have come to attend this conference and we wish for an enjoyable high scientific level conference and hope to meet you again in the future.

With our best wishes and warm regards,

Prof. Dr. Ekrem SAVAS

Chair of the Conference

INVITED TALKS

LIST OF TALKS

INTERNATIONAL CONFERENCE on RECENT ADVANCES in
PURE AND APPLIED MATHEMATICS (ICRAPAM 2016)
May 19-23, 2016, La Blanche Resort & Spa,
Bodrum-Mugla, TURKEY www.icrapam.org

Soft Contraction Theorem

Mujahid Abbas
Department of Mathematics and Applied Mathematics, University of Pretoria, Hatfield, Pretoria, South Africa
abbas.mujahid@gmail.com

Abstract: Soft set theory has become a full-fledged research area and a vast amount of mathematical activity has been carried out to obtain many remarkable results showing the applicability of soft set theory in decision making, demand analysis, forecasting, information science, mathematics and other disciplines.
On the other hand, fixed point theory deals with the conditions which guarantee that a mapping T of a set X into itself admits one or more fixed points. Fixed point theory serves as an essential tool for solving problems arising in various branches of mathematical analysis.
Intersection of metric fixed point and soft set theories is a very recent development.
The aim of this talk is to discuss the concept of soft contraction mapping on soft metric spaces and then, a theorem of Banach contraction principle type called soft contraction theorem in the setup of soft complete metric spaces. An example which illustrate some restrictions of soft metric fixed point theory is discussed.

Uniform and Pointwise Inequalities for Algebraic Polynomials on a Regions in the Complex Plane

Fahreddin G. Abdullayev
Department of Mathematics, Mersin University,
Mersin, Turkey
fabdul@mersin.edu.tr

Abstract. In many areas of research in mathematics (in approximation theory, embedding theory and etc.), one can be faced with two important problems: determining how to undergo a change of (semi)norm of the holomorphic function when the given region expands; determining the relationships between different (semi)norms of analytic functions in a given finite Jordan region on the complex plane in the various (semi)normed space. We will consider this problems for algebraic polynomials of complex variables in the well known Bergman and Lebesgue spaces, and investigate the following problems: evaluating the increase of the modulus of polynomials in the exterior of the given region with respect to the (semi)norm of the polynomial in the this region [1,2,3]; determining a change of (semi)norm of polynomials for the given region [4,5] and, finally, combining obtained estimations for the modulus of polynomials, we will get the estimation modulus of polynomials in whole complex plane [5].

Keywords: Algebraic Polynomials, Conformal Mapping, Smooth Curve, Quasicircle.

References:

[1] Hille E., Szegö G., Tamarkin J.D., On some generalization of a theorem of A.Markoff , Duke Math., 3(1937), 729-739.

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Some Problems of the Theory of Bifurcations of Non-Linear Problems of Fourth Order

Ziyatkhan S. Aliyev
Baku State University, Institute of Mathematics and Mechanics of NAS of Azerbaijan,
z_aliyev@mail.ru

Abstract: For nonlinear Sturm-Liouville problems are obtained sufficiently general results on the local and global bifurcations, which are reflected in Rabinowitz and Berestycki well-known global bifurcation theorems and in works many other authors. But the global bifurcation of solutions of nonlinear fourth-order problems are studied in some papers, only in cases of specific differentiable perturbations of linear fourth-order problem with constant coefficients for specially chosen boundary conditions.
In the present report, will be provided the construction of meaningful theory local and global bifurcations of a broad class of nonlinear eigenvalue problems for ordinary differential equations of fourth order.

Matrix Maps Between Statistical Sequence Spaces

Jeff Connor
Department of Mathematics Ohio University Athens, Ohio 45701
connorj@ohio.edu

Abstract: This talk is intended for a general audience, and will present an approach to describing maps between "statistical" sequences spaces: sequence spaces where the role of finite sets has been replaced with members from an ideal of subsets of natural numbers. The best known of these ideals is the collection of subsets of natural numbers that have arithmetic mean density zero. Although this talk will focus more on broad principles than particular results, there will be some discussion of results related to matrices that map statistically convergent sequences into themselves, maps that preserve the statistical core, and maps that preserve statistical asymptotic limits.

Applications of Newton Interpolating Series in Archimedean and Non-Archimedean Analysis

Ghiocel Groza
Department of Mathematics and Computer Science,
Technical University of Civil Engineering Bucharest,
Bucharest, Romania
grozag@utcb.ro

Abstract: Newton interpolating series, which is a natural generalization of Taylor series, have useful applications in different areas of mathematics. Since the partial sums of a Newton interpolating series are Newton interpolation polynomials they are a useful tool in the interpolation theory and they can be used to approximate solutions of boundary value problems for differential equations (see, for example, [1], [2], [3]). Also the expansion of the exponential function into a suitable Newton interpolation series is the key of proof of an important result in number theory (see [4]).
In the case of complex functions (see [5], [6]) important results on entire functions follow easily by using Newton interpolation series. Useful results are obtained also for non-archimedean fields (see [7]), where they generalize Mahler series.

Keywords: Newton Interpolating Series, Boundary Value Problems, Analytic Function, Non-Archimedean Field, Mahler Series.

References:

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Some Classes of Divergent Sequences

Ljubiša D.R. Kočinac
University of Niš, Faculty of Sciences and Mathematics, 18000 Niš, Serbia
lkocinac@gmail.com

Abstract: We present some known and some new results concerning certain classes of divergent real sequences related to the Karamata theory in asymptotic analysis. Relations of these classes of sequences with selection principles theory will be discussed. We also consider statistical versions of some of the mentioned notions.
Keywords: Regular Variation, Rapid Variation, Selection Principles, Statistical Convergence.

Morrey Regularity of the Weak Solutions of Some Quasilinear Elliptic Systems

Lubomira Softova
Department of Civil Engineering, Design, Construction and Environment,
Second University of Naples, Italy
luba.softova@unina2.it

Abstract: We consider quasilinear divergence form elliptic systems defined via Carathéodory maps satisfying controlled growth conditions with data belonging to some Morrey spaces. In addition we suppose that the principal operator satisfies componentwise coercivity condition for large values of the solution. We show essential boundedness, higher integrability and Morrey regularity of the weak solution in bounded domain, satisfying the Reifenberg flatness condition.
Keywords: Quasilinear Elliptic Systems, Controlled Growth Conditions, Coercivity Condition, Boundedness, Morrey Spaces.

References:

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The Navier-Stokes Equations – New Trends on Weak and Strong Solutions

Werner Varnhorn
Institute of Mathematics, Kassel University,
34109 Kassel, Germany
varnhorn@mathematik.uni-kassel.de

Abstract: The nonstationary nonlinear three-dimensional Navier-Stokes problem occupies a central position in the study of nonlinear partial differential equations, dynamical systems, scientific computation, and classical fluid dynamics. Because of the complexity and variety of fluid dynamical phenomena on the one hand, and the simplicity and exactitude of the equations' shape on the other hand, a strong depth and beauty is expected in the mathematical theory. It is a source of pleasure and fascination that many of the most important questions in the theory remain yet to be answered. So the famous American Clay Mathematics Institute created the Navier-Stokes Millennium Price Problem and offered one Million Dollar for its solution, stating: "Although the Navier-Stokes equations were written down in the 19th Century, our understanding of them remains minimal. The challenge is to make substantial progress toward a mathematical theory, which will unlock the secrets hidden in the Navier-Stokes equations". The modern mathematical theory of the Navier-Stokes equations started with the pioneering work of Jean Leray [6] in 1933-34. Leray was the first to use methods of functional analysis for the treatment of partial differential equations. He developed the concept of weak solutions for the Navier-Stokes Cauchy problem and proved their existence globally in time long before Schwartz established the theory of distributions, and even before Sobolev systematically introduced the spaces bearing his name. Leray has laid the basis of the mathematical theory for the Navier-Stokes equations as we know it today, and he has introduced many tools and ideas still used constantly since then. The lecture introduces the Navier-Stokes equations from a historical and physical point of view, touches some fundamental mathematical problems of viscous incompressible fluid flow [1,4,8] and ends up with recent regularity results on weak [5] and strong [7] solutions in Sobolev and Besov spaces [2,3].

Keywords: Navier Stokes Equations, Weak Solutions, Strong Solutions, Serrin's Condition, Besov Spaces.

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Neo-Equilibrium Point in the Network Game

Ahmad Termimi Ab Ghani
School of Informatics and Applied Mathematics,
Universiti Malaysia Terengganu, Malaysia
termimi@umt.edu.my

Abstract: Mavronicholas et al. [1] presented a network game as an undirected graph whose nodes are exposed to infection by attackers, and whose edges are protected by a defender. After that, MedYahya et al. [2] generalized the model so that they have many defenders instead of a single player. Then in [3], we introduced a new network game with the roles of players interchanged, and obtained a graph-theoretic characterization of pure Nash equilibria of our new model. Then in [4], we focus on mixed strategies and study the complexity of finding (mixed) Nash equilibria in the new game. In this paper, we provide a variation of Nash equilibrium with respect to graph properties.
Keywords: Pure Strategy, Mixed Strategy, Nash Equilibrium.
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An Extension of Derivation on Prime Near-Rings

Madugu Abdu and Moharram A. Khan
Department of Mathematics and Computer Science
Umaru Musa Yaradua University, Katsina,
P.M.B. 2218 Dutsin-ma Road, Katsina Sstate, Nigeria.

abdumadugu@yahoo.com, mkhan91@gmail.com

Abstract. In this talk, we discuss the study of derivation in near-rings that was initiated by Bell and Mason (1987) and found many results regarding the behavior of near-ring as a commutative ring. In this line of investigation several authors have studied commutativity of prime and semi prime-rings admitting suitably constrained derivations. From this observation, it is a natural to look for comparable results as near-ring. Our aim is to investigate identities and then extend some results on prime near-ring with derivations. Motivated by this, we establish the commutativity of prime near–ring N, if there exist positive integers m, n such that N admit a derivation d satisfying the folloing identities:

(i) $d([x,y]) + y^m[x,y]y^n = 0 \ \forall \ x,y \ \in N$

(ii) $d([x,y]) - y^m[x,y]y^n = 0 \ \forall \ x,y \ \in N$

(iii) $d(xoy) + y^m(xoy)y^n = 0 \ \forall \ x,y \ \in N$

(iv) $d(xoy) - y^m(xoy)y^n = 0 \ \forall \ x,y \ \in N.$

Keywords: Commutativity, Derivation, Prime Near-Ring.

References:

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Polynomial Inequalities on Unbounded Regions

F. G. Abdullayev, G. A. Abdullayev
Mersin University
Mersin, Turkey
fabdul@mersin.edu.tr; gabdullayeva@yandex.com

Abstract. In this, we study the estimation of the modulus of algebraic polynomials on the boundary contour of unbounded regions with weight function, when the contour and the weight function have some singularities, wich respect to the their quasinorm in the weighted Lebesgue space and the exterior Riemann function. We obtain sharp estimations for modulus of polynomials on the every points of the unbounded region.

Keywords: Algebraic Polynomials, Conformal Mapping, Quasi-Smooth Curve, Quasicircle.

References:

[1] Hille E., Szegö G., Tamarkin J.D., On some generalization of a theorem of A.Markoff , Duke Math., 3(1937), 729-739.

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Using Wavelet Denoising Methodology for Enhancing the Performance of Forecasting of ARIMA Methodology

Qais Mustafa Abdulqader
Department of Hospital Management, Duhok Polytechnic University,
Dohuk, Zakho, Iraq
qais.mustafa@dpu.edu.krd

Abstract: Many applications have been done in the field of using wavelet analysis for time series analysis such as the recent works of Mustafa and Alzubaydi [1] and also Oinam, Kumar and Patil [2]. In [3] Koo, Lee and Park suggested a method for short-term electric load forecasting that uses a wavelet transform and group method of data handling algorithm. In this paper, we aim to describe how wavelet denoising can be used in time series forecasting and improve the forecasting quality through applying both methodologies on electricity load data and comparing the efficiency of the main classical ARIMA methodology and wavelet denoising methodology.The comparison is depending on some statistical criteria.

Keywords: Wavelet Denoising, ARIMA Methodology, Time Series Forecasting, Electricity Load Data.

References:

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The Use of Conformable Variational Iteration Method, Conformable Reduced Differential Transform Method and Conformable Homotopy Analaysis Method for Solving Different Types of Nonlinear Partial Differential Equations

Omer Acan[1,2] Omer Firat[3] Yildiray Keskin[1]*
[1]Department of Mathematics, Science Faculty, Selçuk University, Konya 42003, Turkey
[2]Department of Mathematics, Faculty of Arts and Science, Siirt University, Siirt, Turkey
[3]Department of Mathematics, Faculty of Arts and Science, Kilis 7 Aralik University, Kilis
**omeracan@yahoo.com,*
ofirat@gmail.com, yildiraykeskin@yahoo.com

Abstract: In this presentation, we introduce conformable variational iteration method (C-VIM), conformable fractional reduced differential transform method (CFRDTM) and conformable homotopy analysis Method (q-HAM). These methods are a new version of well known variational iteration method (VIM), reduced differential transformation method (RDTM) and homotopy analaysis method (HAM) based on new defined conformable fractional derivative to solve linear and nonlinear fractional partial differential equations (PDEs). Firstly, we present some basic definitions, theorems and general algorithm for proposal methods to solve linear and nonlinear fractional PDEs. And then to better understand, the presented new methods are supported by some examples. Finally, the obtained results are illustrated by the aid of graphics and the tables. The applications show that these new techniques C-VIM, CFRDTM and q-HAM are extremely reliable and high accuracy and provide a significant improvement in solving linear and nonlinear fractional PDEs

Keywords: Fractional derivative, Conformable variational iteration method (C-VIM), Conformable fractional reduced differential transform method (CFRDTM), Conformable homotopy analaysis method (q-HAM), Partial differential equations.

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Rough Semicontinuous Set Valued Maps

Fatma Gecit Akcay and Salih Aytar
Department of Mathematics, Süleyman Demirel University,
Isparta, Turkey
salihaytar@sdu.edu.tr

Abstract: In this talk, we define the concepts of rough semi-continuity and rough continuity of set valued maps. Then we will investigate whether these definitions can be characterized in different ways or not. Finally, we will investigate whether rough continuity is preserved under certain operations or not.
Keywords: Rough Continuous; Set-Valued Map; Upper Semi-Continuous; Lower Semi-Continuous.

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On a New Subclass of Meromorphic Functions with Positive Coeffitients Defined by a Certain Integral Operator

Arzu Akgul
Department of Mathematics, Kocaeli University,
Kocaeli, Turkey
akgulcagla@hotmail.com

Abstract: Many subclasses of meromorphic functions with positive coeffitient have been defined and studied in the past. The functions in this class are introduced by Junea and Reddy [5]. The aim of the present paper is to introduce a new subclass of meromorphic funtions with positive coeffitients by means of a certain integral operator introduced by Lashin [7] and a necessary and suffitient condition for a function f to be in this class. We obtain distortion properties, radii of close-to-convexity, starlikeness, meromorphically convex linear combinations for the functions f in this class.

Keywords: Meromorphic Function, Positive Coeffitients, Coeffitient Inequality, Integral Operators, Convex Linear Combination.

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Some Properties of Generalized Hausdorff Matrices

F.Aydin Akgun and B.E.Rhoades
Department of Mathematical Engineering, Yildiz Technical University, Istanbul, Turkey
Department of Mathematics, Indiana University, Bloomington, U.S.A.
fakgun@yildiz.edu.tr, rhoades@indiana.edu

Abstract: The nonzero entries of an H-J matrix are defined by

$$h_{nk}(\mu;\lambda) = \lambda_{k+1} \dots \lambda_n [\mu_k, \dots \mu_n]$$

where [.] is the symmetric difference operator defined by $[\mu_k, \mu_{k+1}] = (\mu_k - \mu_{k+1})/(\lambda_{k+1} - \lambda_k)$ and, for n > 1,

$$[\mu_k, \dots, \mu_n] = \{[\mu_k, \dots, \mu_{n-1}] - [\mu_{k+1}, \dots, \mu_n]\}/(\lambda_n - \lambda_k)$$

Hausdorff considered those methods for which $\lambda_0 = 0$, and Jakimovski[2] investigated such matrices for $\lambda_0 > 0$.
The other generalization we shall consider is the class of E-J matrices, which were defined independently by Jakimovski [2] and Endl [1]. The nonzero entries of an E-J matrix are

$$h_{nk}^{(\alpha)} = \binom{n+\alpha}{n-k} \Delta^{n-k} \mu_k, 0 \le k \le n, n, \alpha \ge 0$$

Thus, the H-J matrices reduce to the E-J matrices by setting λ_n = n + α, and the choice λ_n = n yields the ordinary Hausdorff matrices. The purpose of this paper is to show that, in spite of the richness of these integral domains of operators, there are no conservative H-J matrices with certain kinds of structure.
Keywords: H-J Matrices, E-J Matrices, Hausdorff Matrices.
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Matrices Which Preserve Decreasing Sequences

F.Aydin Akgun, S. Mahmood and B.E.Rhoades
Department of Mathematical Engineering, Yildiz Technical University, Istanbul, Turkey
Department of Mathematics, Indiana University, Bloomington, U.S.A.
fakgun@yildiz.edu.tr,mosamosa510@yahoo.com
rhoades@indiana.edu

A sufficient condition is established in order for large classes of nonnegative triangular matrices to map positive monotone decreasing sequences into positive monotone decreasing sequences. A necessary condition is obtained, and examples are also given of some positive matrices which, because of their structure, map positive monotone decreasing sequences into positive monotone decreasing sequences.

Keywords: Monotone Decreasing Sequences, Factorable Matrices, Generalized Nörlund Matrices, Summability Matrices, Weighted Mean Matrices.

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Some Mixed Means of Fourier Series in Lebesgue Spaces $L_{p,\omega}(T^d)$ with Muckenhoupt Weights ω

Ramazan Akgun
Department of Mathematics, Balikesir University,
Balikesir, Turkey
rakgun@balikesir.edu.tr

Abstract: Mixed modulus of smoothness in Lebesgue spaces with Muckenhoupt weights are investigated. Using mixed modulus of smoothness we obtain Potapov type direct and inverse estimates of angular trigonometric approximation of functions in these spaces. Also we obtain equivalences between mixed modulus of smoothness and K-functional and realization functional. Fractional order modulus of smoothness is considered as well.
Keywords: Direct/Inverse Theorems, Muckenhoupt Weights, Modulus of Smoothness, Fourier Series, Mixed Means.
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On Iterative Processes and Spectral Problems of Generalized Difference Operator-Matrices

Ali M. Akhmedov
akhmedovali@rambler.ru

Abstract: The main purpose of this work is to determine the fine spectrum of the operators $B(r,s,t)$ and Δ_{uvw} defined by a triple band matrices over some known sequences spaces. For it we have used new approach using some recurrence relation which arises in resolvents above operators. Analyzing the work [1] and [2] one can see that the receiving conditions for the spectra of the operators $B(r,s,t)$ and Δ_{uvw} not easy verifiable. In this work we have found new conditions for the spectrum which are more simple than conditions in [1] and [2].

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On Compactness of Bigeneralized Topological Spaces

Samer Al-Ghour
Department of Mathematicsand Statistics, Jordan University of Science and Technology, Irbid, Jordan
algore@just.edu.jo

Abstract: Via q-open sets and u-open sets; q-compactness, u-compactness, s-compactness and q-compactness are introduced in bigeneralized topological spaces. Several relationships, examples and counterexamples regarding them are given. The study is focued on subspaces and continuity images of each of them.
Keywords: Generalized Topology, Bigeneralized Topology, Compact, Continuous Functions.

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Hermitian Part, and Skew Hermitian Part of Normal Matrices

M.Al-Hawari
Irbid National University
Irbid
analysis2003@yahoo.com

Abstract: In this work we find relations between a normal matrix,a Hermitian part , and skew Hermitian part of Normal Matrices. Also we present new results for this subject.

Keywords: Normal Matrix, Hermitian Part, Skew Hermitian Part.

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On (μ,λ)-C-Continuous Functions in Generalized Topological Spaces

Ahmad Al-Omari
Department of Mathematics, Al al-Bayt University
Jordan
omarimutah1@yahoo.com

Abstract: Let (X,μ) be a generalized topological space (GTS) on X due to Császár. In this paper, we define and investigate the notions of (μ,λ)-C-continuous. Let μ and λ be generalized topologies on X and Y, respectively. A function $f:(X,\mu)\to(Y,\lambda)$ is said to be (μ,λ)-C-continuous at x if U is a λ-open subset of Y containing $f(x)$ such that $Y-U$ is λ-compact, then there exists $V\in\mu$ containing x such that $f(V)\subseteq U$. The function f is said to be (μ,λ)-C-continuous on X provided f is (μ,λ)-C-continuous at each point of X .The connections between these functions and other related functions are investigated.

Keywords: Generalized Topology, (μ,λ)-Continuity, Weak (μ,λ)-Continuity, μ-Compact

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Fuzzy Hypergraphs: Medical Application

Hanan A. Alolyian
King Saud University
Mathematics department
holayan@ksu.edu.sa

Abstract: We deal with fuzzy directed hypergraphs as a tool to model and solve some classes of problems arising in medical field. Important concepts are defined using a relational formalism and fuzzy theory.

The representation of complex systems as Fuzzy hypergraphs is appropriate for the study of certain problems. Linear systems have proved their importance to solve many applied problems, combined them to hypergraphs. [1,2].

Fuzzy hypergraphs are generalization of fuzzy graphs, and quite often have proved to be a successful tool to represent and model concepts and structures in various areas of Computer Science and Discrete Mathematics [3,4].

Keywords: Fuzzy Theory, Relation Algebra, Hypergraphs Fuzzy Hypergraphs.

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Numerical Solution of Fractional Second-Order System by Using Reproducing Kernel Algorithm

Zuhier Altawallbeh[1], Mohammed Al-Smadi[2], Ali Ateiwi[3,]*
[1]Department of Mathematics, Tafila Technical University, Tafila 66110, P.O. Box 179, Tafila-Jordan
[2]Department of Applied Science, Ajloun College, Al-Balqa Applied University, Ajloun 26816, Jordan
[3]Department of Mathematics, Faculty of Science, Al-Hussein Bin Talal University, P.O. Box 20, Ma'an-Jordan
zuhier1980@gmail.com

Abstract: This study proposes numeric-analytic technique, called fractional reproducing kernel method (FRKM), for providing approximate solution of system of differential equation of fractional-order with appropriate initial conditions in Caputo sense. The solution methodology is based on generating an orthogonal system from the obtained kernel function in Hilbert space. The analytical solution is formulated in form of a finite series whilst the n-term numerical solution is proved to converge uniformly to analytical solution. However, numerical examples are given to show the good performance of the FROM. The results indicate that the present algorithm is powerful tool for solving other fractional problems arising in physics, computer and engineering fields. For more details about reproducing kernel method and fractional calculus, we refer to [1-5]

Keywords: Reproducing Kernel Theory, Fractional Differential Equation, System of Initial Value Problem, Numerical Solution.

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Majorization by Starlike Functions

Osman Altıntaş[1] *, Öznur Özkan Kılıç*[2]
1Department of Matematics Education, Baskent University, Baglica, TR-06810, Ankara, Turkey,
oaltintas@baskent.edu.tr
2Department of Statistics and Computer Sciences, Baskent University, Baglica, TR 06810, Ankara, Turkey,
oznur@baskent.edu.tr

Abstract. The main object of this paper is to investigate some majorization problems involving the subclass $S(\alpha, A, B)$ of starlike functions in the open unit disk *U*. Relevant connections of the results presented here with those given by earlier workers on the subject are also indicated.

Keywords: Analytic Function, Starlike Function, Convex Function, Subordination, Majorization, Quasi-Subordination.

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A New Approximate Solution for Quadratic Riccati Differential Equation

Nidal Ankira
Department of Mathematics,Faculity of Science and Information Technolog ,
Irbid National University, Irbid, Jordan
alanaghreh_nedal@yahoo.com

Abstract: An efficient algorithm based on the optimal homotopy asymptotic method (OHAM) is introduced to obtain an approximate solutions of a class of nonlinear quadratic Ricati differential equations. Two examples are considered to demonstrate the efficiency and simplicity of the presented method. The obtained results show that only a few terms required to obtain an approximate solutions which is more accurate and effective than other solutions in litreture. .

An Algorithm for Solving Bi-Matrix Games

Aicha Anzi, Ramzi Kasri, Hicham Lenouar and Radjef Mohammed Said
Department of Operations Research,University of Bejaia,
Bejaia, Algeria
anzi_aicha@yahoo.fr

Abstract: The search of Nash equilibrium is the most common problem in game theory. The equilibrium that consists in taking single decision (pure) may not exist, it will be then of interest to seek the mixed strategy equilibrium which constitutes a probability distribution over the entire set of strategies. For the latter, Nash [1] showed the existence in the case of normal form games.
In this work, we aim to calculate this equilibrium for a bi-matrix game, that is to say a finite non zero-sum and normal form game. For this, we used a nonconvex optimization technique which is DC (Difference of Convex) optimization and DCA (DC Algorithm) [2]. First, we reformulated the bi-matrix game as a linear complementarity problem (LCP) [3]. Then, we transformed the LCP into an optimization problem for which we considered four formulations which lead to four DCA versions that we tested and compared on games whose equilibrium is known. We also conducted a comparison study with another algorithm for solving bi-matrix games.
Keywords: Bi-Matrix Games, LCP, DC Optimization, DCA.
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Boundary Stabilization of a Flexible Beam with a Tip Rigid Body Without Dissipativity

Moulay Driss Aouragh
M2I Laboratory, MAMCS Group, FST Errachidia
P.O Box 509 Boutalamine, 52000 Errachidia
Morocco
d.aouragh@fste.umi.ac.ma

Abstract: A linear feedback control is designed regardless of dissipativity of the system of a exible structure modeled by an Euler-Bernoulli beam which is held by a rigid hub at one end and totally free at the other.To realize the uniform stabilization, the high derivative feedback control is usually required. However, on the other hand, the design of the high derivative feedback controllers in literature are mainly based on principle of passivity that makes the closed-loop system be dissipative so that the system is at least asymptotically stable by lyapunov function method. In applications, on the other hand, there are many ways of designing controllers that make system pratically uniformly stable but there is no dissipativity which usually brings the difficulty of theoretical proof for the uniform stability of the system. The approach used here is so called Riesz basis approach that is recently used to study the basis generation, exponential stability and distribution of eigenvalues of the Euler-Bernoulli beam equations.
Keywords: Boundary Stabilization, Exponential Energy Decay.
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Migrativity Property for Uninorms and Nullnorms

Emel Asici
Department of Software Engineering, Faculty of Technology,
Karadeniz Technical University, Trabzon, Turkey
emelkalin@hotmail.com

Abstract: Durante and Sarkoci[1] introduced the α-migrativity of triangular norms. The migrativity property has been studied for t-norm in([3],[4],[5]), for t-subnorms in[6], for semicopulas, quasi-copulas and copulas in([2],[7]). In this paper the notions of α-migrative uninorms over a fixed nullnorm and α-migrative nullnorms over a fixed uninorm are introduced and studied. All solutions of the migrativity equation for all possible combinations of uninorms and nullnorms are analyzed and characterized. Finally, the migrativity of t-norms over uninorms and nullnorms are introduced and studied.
Keywords: Uninorm, Nullnorm, Migrativity.

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Totally Free Square Complexes

Hasan Atik[1]
[1]*Istanbul Medeniyet University,, Istanbul, Turkey*
hasan.atik@medeniyet.edu.tr

Murat Atik[2]
[2]*Karatekin University, Çankırı, Turkey*
murat.atik@karatekin.edu.tr

Abstract: In this work, we show that category of totally free square complexes is cofibration category in the sense of Baues. We also explore homotopies for crossed squares and square complexes morphisms.
Keywords: Crossed Square, Cofibration Category.
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Trigonometric Approximation in Weighted Lorentz Spaces

Ahmet Hamdi Avsar
Department of Mathematics, Necatibey Education Faculty,
Balikesir University, Balikesir, Turkey
ahmet.avsar@balikesir.edu.tr

Abstract: In this study, we obtain the degree of trigonometric approximation for a general class of lower triangular matrices with nonnegative entries and monotone rows in the weighted Lorentz sapaces with Muckenhoupt weights. We show that the degree of its approximation is $O(n^{-\alpha})$. In [2], the similar results were obtained in Lebesgue spaces. The same degree of approximation were obtained by Chandra [1] using Nörlund mean transform of the Fourier series representation for *f* in Lebesgue spaces.

Keywords: Weighted Lorentz Space, Lower Triangular Matrice, Fourier Series, Muckenhoupt Weight.

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On Multiplicative Complex Integral

Agamirza E. Bashirov and Sajedeh Norozpour
Eastern Mediterranean University
Gazimagusa, North Cyprus
agamirza.bashirov@emu.edu.tr
sajedeh.norozpour@cc.emu.edu.tr

Abstract: In 1972 Grossman and Katz [1] proposed alternative calculi to the calculus of Newton and Leibnitz. Among them multiplicative calculus is most
popular. This pioneering work initiated numerous studies.
What is the difference between Newtonian and multiplicative calculi? Both them describe the system of knowledges which is called calculus. Newtonian calculus describes it with reference to the linear function while multiplicative calculus with reference to the exponential function. Therefore, every theorem in one of them has an analog in the other one.
Is it reasonable a consideration of a new calculus while Newtonian calculus is already well established? It is reasonable because different presentations of calculus provide different views. If proving some theorem is diffcult in one of them, it may be more visible and easy in another one. In such a way, in [2] it is proved the non-analyticity of some infinitely many times differentiable function in a rather compact form by means of multiplicative calculus while its prove by means of Newtonian calculus is rather complicated.
Motivated from the exponential nature of complex numbers, in [3] complex differentiation was revised by means of multiplicative calculus. In the present presentation we are aiming to present the results related to multiplicative complex integration from [4]. Since the multivalued nature of complex logarithm, which has an underlying role in multiplicative calculus, complex multiplicative calculus is not one-to-one transformation of ordinary complex calculus. In particular, unlike ordinary complex integral, multiplicative complex integral has a multivalued nature as well. This makes its properties to be in the form of inclusion rather than in the form of equality.
The Cauchy integral formula is not affected in the multiplicative case, that is, the multiplicative complex integral does not count residues, etc. All these demonstrate that we should expect nontrivial transformation of complex calculus to multiplicative case, that is not yet completely formalized. We are going to discuss these issues in our presentation.
Keywords: Nwetonian Calculi, Multiplicative Calculi, Complex Multiplicative, Complex Integral.

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The Spectrum and Trace of a Discontinuous Value Problem with Retarded Argument

M. Bayramoglu and A. Bayramov
Institute of Mathematics and Mechanics of NAS of Azerbaijan
Azerbaijan State Pedagogical University, Baku
azadbay@gmail.com

Abstract: In this study a discontinuous boundary value problem with retarded argument and with transmission conditions at two points of discontinuity investigated.We obtained asymptotic formulas for eigenvalues and regularized trace of eigenvalues.

Numerical Solution of Semilinear Elliptic Equation via Difference Schemes

Elif Ozturk Beıgmohammadı [1], Esra Demirel[2]
[1]Department of Economics, Canakkale Onsekiz Mart University, Canakkale,Turkey
eozturk@comu.edu.tr
[2] Department of Banking and Finance, Canakkale Onsekiz Mart University, Canakkale, Turkey
esrademirel@comu.edu.tr

Abstract: We consider

$$\begin{cases} -\dfrac{d^2u(t)}{dt^2}+Au(t)=f(t,u(t)), \quad 0<t<1; \\ u(0)=\varphi, \\ u(1)=\sum\limits_{j=1}^{J}\alpha_j u(\lambda_j)+\psi, \ 0<\lambda_1<...<\lambda_J<1, \\ \sum\limits_{j=1}^{J}|\alpha_j|<1 \end{cases}$$

Bitsadze-Samarskii type nonlocal boundary value problem for semilinear elliptic equation. For approximate solution of this problem the first and second orders of accuracy difference schemes are presented. We have second order difference equations with respect to n with matrix coefficients. These difference equations are solved by modified Gauss elimination method and iteration method.

Keywords: Semilinear Elliptic Equation, Difference Scheme, Bitsadze-Samarskii Type Problem.

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The Mathematical Models for Pavement Design

Mouloud Belachia, Nadjette Bouacha
Laboratory of Materials, Geotechnics, Habitat and Urban
University of 20 Aout 1955 - Skikda ALGERIA
belachia@yahoo.fr

Abstract: In general pavement design rules are based in part on the geotechnical knowledge at break, the characteristics of deformability of materials determined by laboratory tests and findings on the behavior of structures, other hand on Mathematical methods: rational approach lanes by a suitable mathematical model and finally the confrontation between technological knowledge and theoretical results.
The examination of a set of analytical models that have succeeded in time, the simplest model like BOUSSINESQ the most complicated model like Burmister, led us to conclude that the main defect is to introduce many simplifying assumptions. It is therefore necessary to introduce the finite element method, because the development of the latter allows considering the use of more realistic models that have the opportunity to study edge loading problems and the ability to consider materials not of an elastic behavior.
Keywords: Mathematical Model, Pavement Design, Finite Element Method.
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On Quadratic Integral Equations of Volterra Type in Fréchet Spaces

Latifa Benhamouche
Department of Mathematics, University Saad Dahlab of Blida
Blida, Algeria
latifabenhamouche@gmail.com

Abstract : We investigate the existence of solutions of Quadratic integral equations of Volterra type by using Schauder-Tychonov fixed point theorem in the Fréchet Space of continuous functions on unbounded open set Ω of R^n.
Many authors studied the solvability of several types of integral equations; most of their results were obtained in the Banach space of bounded and continuous functions on the nonnegative real half axis, by using fixed point theorems via measures of noncompactness (see for e.g [1-2] and references therein) . The use of measures of noncompactness turns to be a good technique allowing not only to get the existence of solutions but also to obtain some characterizations of those solutions. However, some restrictive conditions are caused by applying such measures in such a space.Recently, in [3-4] authors defined the notion of sequence of measures of noncompactness and obtained some good existence results in the Fréchet Space of continuous functions on the real half axis. More recently authors in [5] developed some fixed point theorems in locally convex spaces and succeed to get existence result in the space C(R^+, R^d) without using the technique of measures of noncompactness. Our aim is to generalize their ideas to the case of unbounded open sets Ω of R^n for a quit general quadratic Volterra type equation and to slightly relax the assumptions in [3].
Keywords: Quadratic Integral Equations, Schauder-Tychonov Fixed Point Theorem, Volterra Operator, Fréchet Spaces.

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On *A*-Statistical Convergence with Density of Moduli

Stuti Borgohain and Ekrem Savas
Department of Mathematics,Istanbul Ticaret University,
Uskudar, Istanbul, Turkey
ekremsavas@yahoo.com

Abstract: Since the invention of statistical convergence by Fast [2] and Schoenberg [3] independently, many mathematicians have been working on several generalizations and applications of this notion. One can refer ([5] ,[4] , [1], [5]) to get more references of works on statistical convergence and its applications to different fields.

We study the concept of density of moduli with respect to *A*-statistical convergence where *A* is a non-negative regular matrix. Also we are trying to investigate some relation between the ordinary convergence and module statistical convergence on *A*-statistical convergence for evey unbounded modulus function. Morever we also study the newly introduced *f*-statistical on *A*-summability for a non-negative regular matrix *A*.

Keywords: Statistical Convergence, *f*- Statistical Convergence, *A*-Summability.

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The Boundary Integral Method for the Laplace Equation with Mixed and Oblique Conditions

Hamza Bouguerne
Department of Mathematics, Applied Mathematics Laboratory,
University Badji Mokhtar
Annaba, Algeria
m2ma.bouguerne@gmail.com

Abstract: The solvability of the mixed and oblique boundary value problem is estabilshed by the Boundary Integral Equation method. Based on the Green formula, we express the solution in terms of the boundary data. The key to the realization of this method is to translate the tangential derivative to the fundamental solution. A system of boundary intregral equation of second kind Fredholm type is obtained. By the Fredholm and Riez thoerem, the existence and the uniqueness of the solution is established.

Keywords: Boundary Integral Equation Method, Pseudo-Differential Operator, Tangential Derivative.

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Efficiency Conditions for Multiobjective Bilevel Optimization Problem Under Generalized Invexit

Karima Bouibed, Hachem Slimani, Mohammed Said Radjef
LaMOS Research Unit, University of Bejaia,
06000 Bejaia, Algeria.
karima.bouibed@gmail.com

Abstract: In this paper, we consider an optimistic bilevel optimization problem (MBP) where the upper-level is a vector optimization problem and the lower-level is a scalar linear optimization problem. By using the Karush-Kuhn-Tucker conditions associated to the lower-level problem (LLP)x, we reformulate the bilevel optimization problem into a nonlinear multiobjective single-level optimization problem with equality and inequality constraints (MP). Since the problem (LLP)x is linear, we have global (weakly or proprely) efficient solutions of (MP) correspond to global (weakly or proprely) efficient solutions of (MBP). We establish Fritz John type necessary efficiency conditions for (MBP) without using any constraint qualification. Furthermore, we obtain (Fritz John type) sufficient efficiency conditions for a feasible point of (MP) corresponds to a (weakly or proprely) efficient solution for the bilevel problem (MBP) under generalized invexity [2,3] and infineness [1].

Keywords: Multiobjective Bilevel Programming, KKT Conditions, Efficiency Conditions, Generalized Invexity.

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Convergence Result in the Approximation of Some Matrix Functions by Krylov Method (Application on an Inverse Problem)

*A. Bouzitouna [1], N. Boussetila [2] and F. Rebbani [3]
[1,3] Preparatory School of Sciences and Engineering,
B.P. 218 Annaba 23000, Algeria.
[1, 2, 3] Applied Mathematics Laboratory, Badji Mokhtar University - Annaba.
PB 12, 23000 Algeria.
[2] Department of Mathematics, FMISM, Guelma University,
BP. 401, Guelma 24000, Algeria.
a.bouzitouna@epst-annaba.dz [1], n.boussetila@gmail.com [2], f.rebbani@epst-annaba.dz [3]

Abstract: The inverse problems and PDE brought to matrix problems (matrix function) $u = f(A)u_0$, for the squared matrixes A of big sizes; the numeric approximation of the vector u received a considerable attention in the last years.
The objective of this work is to extend the results developed by the author [1], as part of the projection method of Krylov, in case $f(A)v$, where the function $f(Z) = e^Z$ and A is a square symmetric matrix of large size. The results obtained in this investigation are based mainly on the Taylor's series and the estimated remaining integral. Our contribution will focus on the functions encountered in the quantification of certain academic inverse problems. Some results of convergence is given by applying this method on specific types of matrix functions $f(A)$.
In this work, we study the extent of the methods of Krylov subspace, a technique that has been recently proposed to approximate

$$u = f(A)v, \tag{1.1}$$

Note: The convergence criterion is exponentially depending on the size of the K_m projection space and the norm of the matrix A; we can introduce the following inequality

$$\|f(A)v - \|v\|V_m f(H_m)e_1\| \leq 2\|v\| \frac{\lambda_{max}^m e^{\lambda max}}{m!}, \tag{1.2}$$

Keywords: Krylov Subspace, Matrix Function, Inverse Problems, Iterative Method, Projection Method, Arnoldi, Lanczòs, Regularization.

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Stability Result of a Fractional Differential Equation

S. Bouzitouna[1], R. Atmania[2]
[1] Preparatory School of Economics and Management Science, Annaba, Algeria.
[1,2] Applied Mathematics Laboratory, Badji Mokhtar University Annaba, BP12, 23000 Annaba Algeria.
[1] bouzitouna.live@gmail.com , [2]atmanira@yahoo.fr

Abstract: Fractional calculates mathematical analysis is the branch that studies the generalization of notions of derivations and integration are not necessarily entire orders (real or complex); fractional differential equation is considered an ingenious application of fractional calculus.
In fact; fractional derivatives have a nonlocal character which made them a powerful tool for the description of the hereditary effects of different substancesand for modeling some dynamic processes.
In this work, we are interested in generalized equation of Sturm-Liouville is a real second order linear differential equation of the forme:

$$\frac{d}{dx}\left[p(x)\frac{dy}{dx}\right] + q(x)y = -\chi w(x)y$$

With the boundary conditions Connect the values y(a), y'(a),y(b) and y'(b).
Keywords: Fractional Calculus, Sturm-Liouville Equation, Caputo Derivative, Ulam Stability.
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Analysis of Centrodes in Planar and Spherical Motion

Serife Nur Bozdag, Ali Çalıskan
Department of Mathematics, Ege University,
Bornova, İzmir, Turkey
serife.nur.yalcin@ege.edu.tr, ali.caliskan@ege.edu.tr

Abstract: We can first trace kinematic geometry's influence on space kinematics in the works of Blashke and Müller [1]. Than lots of developments and novelty have been made in planar, spherical and spatial kinematics with studies of Hunt[2], Bottema and Roth[3]. In [4] Wang, Liu and Xiao introduced a new approach of a space curve adjoint to a ruled surface which is based on differential geometry. In this paper, we study and give some classifications of centrods of planar and spherical motion by an addjoint approach. We also present the properties of these centrodes which we believe that these properties can provide contributions to the kinematic differential geometry and theoretical mechanics.

Keywords: Kinematic geometry, rigid body motion, invariants, centrodes

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Empirical Likelihood for Copula Moment Based Estimation Method

Brahim Brahimi
Department of Mathematics, Laboratory of Applied Mathematics, Mohamed Khider University, Biskra, Algeria
brah.brahim@gmail.com

Abstract: We applied the empirical likelihood method to the copula moment based estimation methods which originally proposed by [4], [5] and [6]. Several authors investigated the empirical likelihood see for instance [7], [1]. [2] and [3]. The advantage of this method is that the empirical likelihood has both effectiveness and flexibility of the likelihood method, and reliability of the nonparametric methods, it helps us to construct confidence intervals without estimating the asymptotic variance, so the complexity of the asymptotic variance for some estimator especially the CM based estimators and the construction of nonparametric confidence intervals via estimating the asymptotic variance is usually inaccurate.

Keywords: Archimedean Copulas; Asymptotic Distribution; Copula Models; Method of Moments; Semiparametric Models; Z-Estimator.

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Approximation of Entropic and Admissible Solution of the Hyperbolic Problems of Conservation Laws by the New Scheme Ziti's δ-Scheme in Several Dimensions. Application to Burgers Equation, Advection Convection Equation, Gaz Dynamics and Biological Problems

Larbi Bsiss[1] *and Chérif Ziti*[2]
Department of Mathematics, Moulay Ismail University,
Meknès 50000, Marocco
1- lyrbi01@gmail.com
2 - chziti@gmail.com

Abstract: Hyperbolic systems of conservations laws can usually be obtained by assuming that the phenomena under consideration evolves on the advection time scale and that other effects, like viscosity, dispersion, capillary, etc, can neglect. This leads to discontinuities, non-uniqueness and "unphysical" solutions. To keep the discontinuities but to avoid the other two possibilities solutions are considered in a weak sense together with some admissibility conditions. Following are the most common admissibility criteria for shocks waves in case of strictly hyperbolic systems:
1- Linearized stability analysis. (Lax conditions)
2- Existence of a stable viscous profile. (Liu's conditions)
3- Physical entropy derived from the second law of thermodynamics.
4- Requirement for hyperbolic equations to be a limit of the same equations perturbed by linear viscosity termes with the multiple of identity viscosity matrix.
5- Solution should be admissible for the equations derived as a weakly nonlinear asymptotic limit of the full physical system of equations.
For example, in case of polytropic gaz dynamics and other similar systems all of above criteria reject the expansion shocks waves.
As it is well known in numerical analysis that most of the numerical schemes have undesirable oscillations, especially near the domain's border, or near the physical phenomena (empty region, collapse, boundary layer, among others)(mathematically invisible) eg: the heat equation with a bad sign, Burgers equation(the solution loses its regularity).
In the case where the differential problem solution presents a singularity (shock, blow-up which cannot be numerically detected easily), the classical scheme cannot generally operate correctly and in the best case we are confronted with a very difficult algorithm, especially in several dimensions.
Generally, well using classical methods such as Finite differences, Finite elements, Particle methods and Spectral methods in hyperbolic problems usually give some oscillation or Gibs phenomena that are not detect and admissible shocks. Therefore we can't obtain any entropy solution. An analysis of such schemes was made in [3][4][5][6][7][8][13], but the extension to several dimensions (n = 2,3,...) is not encouraging [13]. As against the schemes of Godunov and Glimm give entropy solutions in one dimension but unfortunately they are based on solving the Riemann problem

involve a complication state, adding that the extension to several dimension does not give satisfactory results. The problem becomes more complicated if the problem is not strictly hyperbolic.

Our objective here is to construct a less complicated scheme compared to the classical methods by keeping their advantages and obtained the admissible solution in the most difficult situations without complications obtained from the selected meshing.

In this paper, we apply a new approximation method called ziti's δ-scheme to strictly or not strictly hyperbolic problem in one or more dimensions which is able to resist to such oscillation near the singularity and enables us to detect a lot of physical phenomena. We test our method to some models and compare its results with the exact one and other classical methods eg: burgers equation [2] [9][10], gaz dynamic [1][2][9], advection convection problems, biology chemotactic problems [11][12].

We can conclude that our results are very striking. The ziti's δ- scheme that we obtained is faster, more efficient, rebut, easy to handle in several dimension and gives entropy solutions.

Keywords: Hyperbolic, Riemann Problem, Entropic Solution, Shock, Gibbs Phenomena, Gudunov, Glimm, Oscillation, Ziti's δ- Scheme.

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Certain Properties of a New Subclass of Close-to-Convex Functions

Serap Bulut
Kocaeli University, Faculty of Aviation and Space Sciences, Kocaeli, Turkey
serap.bulut@kocaeli.edu.tr

Abstract: We introduce and investigate an interesting subclass $\mathcal{K}_s^{(k)}(\gamma, p)$ of analytic and p-valently close-to-convex functions in the open unit disk $\mathbb{U}$. For functions belonging to this class, we derive several properties as the inclusion relationships and distortion theorems. The various results presented here would generalize many known recent results.

Keywords: Analytic Functions, p-Valently Close-to-Convex Functions, Inclusion Relationships, Subordination Principle.

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Some Fixed Point Theorems Satisfying Generalized B_φ – Contraction on Metric Space and 2-Metric Space

Abdurrahman Buyukkaya, Mahpeyker Ozturk
Department of Mathematics, Sakarya University,
Sakarya, Turkey
abdurrahman.giresun@hotmail.com, mahpeykero@sakarya.edu.tr

Abstract: In this study, we defined the class of B_φ which includes nine-variable functions and strong comparison function and proved some fixed point theorems for the class of B_φ, which is a generalization of the class A that introduced by Akram et al., on metric space and 2-metric space. The class of B_φ is a analogue of the class of B, which is describe by Tran Van An et al.. Also our obtained results extend, generalize and improve the existing literatüre.

Keywords: Fixed Point, Metric Space, A-Contraction, Generalized B_φ-Contraction

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A Characterization of Curves According to Parallel Transport Frame in Euclidean n-Space IE^n

Sezgin Buyukkutuk,, Ilim Kisi, Gunay Ozturk
Department of Mathematics, Kocaeli University,
Kocaeli, Turkey

sezgin.buyukkutuk@kocaeli.edu.tr, ilim.ayvaz@kocaeli.edu.tr,
ogunay@kocaeli.edu.tr

Abstract: In this study, we consider a regular curve in Euclidean n-space IE^n whose position vector is written as a linear combination of its parallel transport frame vectors. We characterize constant ratio curves in terms of their curvature functions. Further, we obtain some results of *T*-constant type and *N*-constant type curves according to its Bishop curvatures in IE^n .

Keywords: Parallel Transport Frame, Position Vector, Constant Ratio Curves.

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Initial Coefficients for a Subclass of Bi-Univalent Functions Defined by Salagean Differential Operator

Murat Caglar
Department of Mathematics, Faculty of Science and Letters, Kafkas University, Kars, Turkey
mcaglar25@gmail.com

Abstract: In this paper, we investigate a new subclass $\Sigma^n(\tau,\gamma,\varphi)$ of analytic and bi-univalent functions in the open unit disk U defined by Salagean differential operator. For functions belonging to this class, we obtain estimates on the first two Taylor-Maclaurin coefficient $|a_2|$ and $|a_3|$.

Keywords: Analytic functions, Univalent functions, Bi-univalent functions, Subordination, Salagean differential operator.

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Beyond the λ-Statistical Ward Continuity

Huseyin Cakalli
Maltepe University, Maltepe, Istanbul, Turkey
huseyincakalli@maltepe.edu.tr

Abstract: A function is λ -statistically downward (resp.upward) continuous if it preserves λ -statistical downward (resp.upward) half quasi-Cauchy sequences, where a real sequence (αk) is called λ -statistically downward half quasi-Cauchy if lim_n→∞(1/n)|{k∈ In: αk+1-αk≥ε}|=0 ,and λ -statistically upward half quasi-Cauchy if lim_n→∞(1/n)|{k∈ In: αk-αk+1 ≥ε}|=0 for every ε>0, where (λn) is a non-decreasing sequence of positive numbers tending to ∞ such that λ n+1≤ λn +1 , λ 1=1, In=[n- λ n+1,n] for any positive integer n. It turns out that a function is uniformly continuous if it is λ-statistical downward continuous on a above bounded set.

Keywords: Statistical Convergence, λ-Statistical Convergence.

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On Abel Statistical Continuity

Huseyin Cakalli, E.İffet Taylan***
** Maltepe University, Maltepe, Istanbul, Turkey*
huseyincakalli@maltepe.edu.tr
*** Maltepe University, Edution Faculty, Maltepe, Istanbul, Turkey*
iffettaylan@maltepe.edu.tr

Abstract: In this paper, we investigate a concept of Abel statistical continuity. A real valued function f is Abel statistically continuous on a subset E of R, the set of real numbers, if it preserves Abel statistical convergent sequences, i.e. $(f(p_k))$ is Abel statistically convergent whenever (p_k) is an Abel statistical convergent sequence of points in E. Some other types of continuities are also studied and interesting results are obtained.

Keywords: Statistical Convergence; Abel Series Method; Continuity.

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A Variation on N_θ Ward Continuity

Huseyin Cakalli, Mikail Et**, Hacer Sengul****
**Maltepe University, Faculty of Arts and Sciences, Istanbul, Turkey*
hcakalli@gmail.com
***Department of Mathematics, Firat University, Elazığ, Turkey*
mikailet68@gmail.com
****Department of Mathematics, Siirt University, Siirt, Turkey*
hacer.sengul@hotmail.com

Abstract: The notion of N_θ convergence was introduced and studied by Freedman, Sember and Raphael[1]. The concept of ideal convergence (or *I*-convergence) of real sequences was introduced by Nuray and Ruckle[2] and later on, lacunary $I-$ convergence of sequences was introduced and investigated by Tripathy, Hazarika and Choudhary[3]. Some further results connected with the notion of the *I*-convergence can be found Savaş and Das[4], Çakallı[5] and many others. In this paper, we shall introduce concept of strongly ideal lacunary quasi-Cauchyness of sequences of real numbers. Strongly ideal lacunary ward continuity is also investigated. Interesting results are obtained.
Keywords: Summability, Continuity, N_θ Convergence.

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A Variation on Strongly Lacunary Ward Continuity

Huseyin Cakalli, Huseyin Kaplan***
**Maltepe University,*
Maltepe, Istanbul, Turkey
huseyincakalli@maltepe.edu.tr
*** Niğde University, Faculty of Science and Letters, Niğde, Turkey*
hkaplan@nigde.edu.tr

Abstract: In this paper, the concept of a strongly lacunary δ-quasi-Cauchy sequence is investigated. In this investigation, we proved interesting theorems related to strongly lacunary δ-ward continuity, and some other kinds of continuities. A real valued function f defined on a subset A of IR is called strongly lacunary delta ward continuous on A if it preserves strongly lacunary delta quasi-Cauchy sequences of points in A. It turns out that the set of strongly lacunary delta ward continuous functions is a closed subset of the set of continuous functions.

Keywords: Summability; Series and Sequences; Continuity and Related Questions.

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On the Smallest Bounding Disks of Graph-Directed Fractals

Gokce Cakmak and Ali Deniz
Department of Mathematics, Anadolu University,
Eskisehir, Turkey
gokcecakmak@anadolu.edu.tr
adeniz@anadolu.edu.tr

Abstract: The computation of a smallest disk that encloses the attractor is needed for more accurate computation of box-counting dimension and for approximation of the attractors. There are numerous algorithms to calculate smallest disk that encloses the IFS attractor including [2], [5], [6]. The most efficient one is introduced by Martyn and it is based on spanning points to which a brief definition will be given. In this work, the existence of the smallest disks containing the attractors of the graph-directed iterated function system (GIFS) is proven and the spanning point algorithm is generalized into GIFS.
Keywords: Fractals, Graph-Directed Iterated Function Systems, Smallest Bounding Disks.
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A Tauberian Theorem for (C,1,1) Summable Double Sequences of Fuzzy Numbers

Ibrahim Canak, Umit Totur and Zerrin Onder
Department of Mathematics, Ege University,
Bornova, Izmir, Turkey

zerrin.onder11@gmail.com; ibrahim.canak@ege.edu.tr; utotur@adu.edu.tr

Abstract: In this study, we recall some notations, basic definitions and theorems for the fuzzy numbers. In the sequel, we determine necessary and sufficient Tauberian conditions under which convergence in Pringsheim's sense of a double sequence of fuzzy numbers follows from its (C,1,1) summability. Finally, we define the slow oscillation of a double sequence of fuzzy numbers in different senses and prove that the slow oscillation in some sense is a Tauberian condition for (C,1,1) summability method. We also give a classical Tauberian theorem in Landau's type for (C,1,1) summability method.

Keywords: Fuzzy numbers, Double sequences of fuzzy numbers, slow oscillation, summability (C,1,1), Tauberian theorems, Tauberian conditions.

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Chemical Applications of Graph Indices

Ismail Naci Cangul[1], Aysun Yurttas[1], Muge Togan[1], Ahmet Sinan Cevik[2]
[1]Department of Mathematics, Uludag University,
Gorukle, Bursa, Turkey

cangul@uludag.edu.tr, ayurttas@uludag.edu.tr, capkinm@uludag.edu.tr
[2]Department of Mathematics, Selcuk University,
Konya, Turkey
ahmetsinancevik@gmail.com

Abstract: In chemistry, one often wants to represent chemical structures such as atoms or molecules in numerical form as completely as possible to study their structural properties. Molecular structures can be modelled by means of graphs, and graphs have several invariant numbers so that isomorphic graphs possess identical values. These values are called as topological indices or graph invariants.
In this talk, we will consider some extensively used topological indices and show how they have been applied to chemical problems.
Keywords: Graph Theory, Topological Index, Graph Theoretical Index, Molecular Graph, Chemometry.
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Permuting *n*-Derivations From Semilattice to Lattice

Sahin Ceran and Utku Pehlivan
Department of Mathematics, Pamukkale University,
Denizli, Turkey
sceran@pau.edu.tr, utkuphlvn@hotmail.com

Abstract: In this paper as a generalization of permuting tri-derivation on a lattice. We introduced the notion of permuting *n*- derivation from semilattices to lattice. We defined the isotone permuting *n*-derivation from semilattices to lattice and got some interesting results about isotoneness. We characterized the istributive and isotone lattices by permuting *n*-derivation from semilattices to lattice.

Keywords: Semilattice, Lattice, Derivation, Permuting *n*-Derivation From Semilattices to Lattice.

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Existence of Solutions for Third Order Boundary Value Problems on an Infinite Interval

Erbil Cetin
Department of Mathematics, Ege University,
Bornova, Izmir, Turkey
erbil.cetin@ege.edu.tr

Abstract: In this work, we study existence of solutions for third order three-point boundary value problems on an infinite interval. The existence results of a solution and three solutions are shown by using upper and lower solution method, the Schauder fixed point theorem and topological degree theory. Two examples are given to illustrate the main results.

Keywords: Third order boundary value problem, Green's function, upper and lower solution.

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In DES Cryptologic System Using Graph Adjacency Matrice for Random Variables

Ahmet Sinan Cevik , Mustafa Yonet
Department of Mathematics Selcuk University,
Konya, Turkey
mustafayonet@hotmail.com

Abstract: In DES algorithm cryptologic system (cf. [1]) uses some random variables (cf. [2]). But this random variables are actually easy by comparing AES algorithm (see, for instance, [3]). In this case DES algorithm cannot be useable in coding theory. But if we change this random variables with "graph adjaceny matrices" (see [4] for the details), it will be revitalized the DES algorithm. By considering same priority of operations with removing S-Box and paritying bit in algorithm priority (cf. [5]), in this removable area, it will be used the symmetric property in graph adjacency matrices.

Keywords: Des Algorithm, Graph Theory, Graph Adjaceny Matrices.

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Inclusion Regions for Matrix Eigenvalues

Mao-Ting Chien
Department of Mathematics, Soochow University
Taipei, Taiwan
mtchien@scu.edu.tw

Abstract: Let A be an n-square matrix, and R_i be the i-th deleted absolute row sum of A. The Gershgorin circle theorem [2] states that all the eigenvalues of A are contained in the Gershgorin region which is the union of n disks centered at the i-th diagonals with radius R_i. We choose special diagonal matrices X, apply X^{-1}AX to the Gershgorin circle theorem, and obtain a new inclusion region of Gershgorin circles. An example is provided to illustrate that this new inclusion region is better than the regular Gershgorin region. Partial results of this talk are included in the paper [1].

Keywords: Matrix Eigenvalue, Gershgorin Circle, Inclusion Region.

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Estimation Procedure for Multi-Parameter Archimedean Copulas Based on the Trimmed L-Moments Method

A.Chine, F. Benatia
L.M.A Laboratory, Department of Mathematics,
M. KHIDER University,Biskra, Algeria
fatahbenatia@hotmail.com

Abstract: A new semiparametric estimation method for multi-parameters Archimedian copulas based on the Trimmed L-moments theory [3,4] is proposed. By using [1,2,5,6,], Consistency and asymptotic normality of the defined estimator are established. Extensive simulation study to compare estimators based on the L-moments, the maximum likelihood and the measures of concordance is carried out. We concluded that this method is quick and does not use the density function and therefore no boundry problems arise.
Keywords: Trimmed L-moments; L-moments, Copulas, Dependence, Concordance measures; Semiparametric estimation.
AMS 2010 Mathematics Subject Classification: 78M05, 62F12, 62H12, 62H20.
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Homology Groups of Certain Khalimsky Digital Spaces

Ismet Cinar and Ismet Karaca*
Department of Mathematics, Ege University,
Bornova, Izmir, Turkey
ismet__cinar@hotmail.com ismet.karaca@ege.edu.tr

Abstract: Khalimsky's topology on the integers is a digital response of the Euclidean topology on the real line. They [2] investigated ordered topological spaces and generalized closed curves in the 1970s. Vergili and Karaca [6] have introduced the concept of singular homology groups of Khalimsky space. They have calculated the digital singular homology groups of certain digital spaces up to the dimension 2. They have also research the digital relative homology groups, Mayer-Vietoris theorem and Excision theorem on Khalimsky space. In this study, we will explain how to calculate digital singular homology groups of some Khalimsky digital space.

Keywords: Khalimsky Topology, Digital Topology, Singular Homology.

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A Quintic B-Spline Based Differential Quadrature Method for Numerical Solution of Extended Fisher-Kolmogorov Equation

Sumita Dahiya, R. C. Mittal
Indian Institute of Technology Roorkee, Roorkee, INDIA
sumita.iitr@gmail.com

Abstract: In this paper, the extended Fisher-Kolmogorov equation [1] is solved numerically by implementing a new differential quadrature technique that uses quintic B-spline as the basis functions for space integration. The derivatives are approximated using differential quadrature method [3]. The weighting coefficients are obtained by semi-explicit algorithm including an algebraic system with penta-diagonal coefficient matrix that is solved using the five-band Thomas algorithm. Stability analysis of method has also been done. The accuracy of the proposed scheme is demonstrated by applying on three test problems. Some theoretical properties of Fisher-Kolmogorov equation [2] like existence, uniqueness and regularity of have been discussed. The results are also shown graphically to demonstrate the accuracy and capabilities of this method and comparative study is done with results available in literature. The computed results are found to be in good agreement with the analytical solutions.

Keywords: Extended Fisher-Kolmogorov (EFK) Equation, Quintic B-Spline, Differential Quadrature Method, Stability

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Certain Types of Open Covers and Selection Perinciples Using Ideals

Pratulananda Das

Department of Mathematics, Jadavpur university
Kolkata-700032, West Bengal, India
pratulananda@yahoo.co.in

Abstract: In this note we make a new and very general approach to the study of open covers and selection principles by using the very general notion of ideals and investigate some of its consequences. Our results present a more general form of some statistical variants of open covers and related selection principles introduced by Di Maio and Kocinac.

Imprimitive Action with Continued Fractions for the Suborbital Graphs

Ali Hikmet Deger[1], Ummugulsun Akbaba[1]
[1]Department of Mathematics, Karadeniz Technical University,
Ortahisar, Trabzon, Turkey
ahikmetd@ktu.edu.tr
ummugulsun.akbaba@ktu.edu.tr

Abstract: The paths of minimal lengths on suborbital graphs for modular group Γ is given in [1]. Modular group acts on the set of extended rational numbers $\bar{\mathbb{Q}}$ transitively. By imprimitive action on the suborbital graphs, our major aim in the present study is to extend the minimal length problem to suborbital graphs fUr $\Gamma_0(N)$ and to examine continued fractions arising from this connection with convergence. Finally, we give some properties for the elements of Mobius group obtained by these relations.

Keywords: Impirimitive Action, Suborbital Graphs, Continued Fractions.

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Degree Sequences of Join and Corona Product of Graphs

Sadık Delen, Ismail Naci Cangul
Department of Mathematics, Uludag University,
Gorukle, Bursa, Turkey
matesadik@gmail.com, cangul@uludag.edu.tr

Abstract: There are several operations on graphs which gives new and larger graphs when applied to two given graphs. Two of them are join and Corona product. Degree sequence of a graph is a non-decreasing sequence consisting of degrees of the vertices of the graph. If there is a graph corresponding to a given degree sequence, then it is said that the degree sequence is realizable. This notion plays an important role in identifying the corresponding graph and classifying graphs according to some properties. In this talk, we determine the degree sequence of the join and Corona product of two given graphs in terms of the degree sequences of the two graphs. Also some properties are obtained.

Keywords: Graph Theory, Degree Sequence, Graph Operation, Join, Corona Product.

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Bifurcation of Flow Patterns and Eddy Structure in an L-Shaped Cavity with Lids Moving in the Same Directions

Ali Deliceoglu
Department of Mathematics, Erciyes University, Kayseri, Turkey
adelice@erciyes.edu.tr

Abstract: Flow development and eddy structure in an L-shaped cavity with lids moving in the same directions have been investigated using both tools from low-dimensional nonlinear dynamics and standard Galerkin finite element method. In particular, structural bifurcation near boundary singular points are used to make a local analysis of the velocity field based on a Taylor series expansion. The (h_1, h_2) parameter space with a series of bifurcation curves are constructed to determine the sequence of flow structures by which eddies are generated in the L-shaped cavity.

Keywords: L-Shaped Cavity, Flow Structure, Bifurcations, FEM, Stabilization.
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A Nonself-Adjoint Dirac Operators with a Spectral Parameter in the Boundary Condition and with Transmission Condition

Isil Acik Demirci, Bilender P.Allahverdiev
Department of Mathematics, Faculty of Education, Mehmet Akif Ersoy University, Burdur, Turkey
isilacik@yahoo.com
Department of Mathematics, Suleyman Demirel University, Isparta, Turkey
bilenderpasaoglu@sdu.edu.tr

Abstract: In this talk, we investigate nonself-adjoint Dirac operators boundary value transmission problems in Weyl's limit circle case in the Hilbert space. A self-adjoint dilation and a spectral model of these operators are constructed and the characteristic function is computed. Theorems on the completeness of the eigenvectors of the nonself-adjoint Dirac operators are proved.

Keywords: Dissipative Singular Dirac System, Spectral Parameter in the Boundary Condition, Transmission Condition, Self-Adjoint Dilatation, Maximal Dissipative Operator, Functional Model, Characteristic Function, Completeness of the System of Eigenvectors and Associated Vectors.

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Close-to-Convexity of a Cross-Product of Bessel Functions

Erhan Deniz
Department of Mathematics, KafkasUniversity,
Kars, Turkey
edeniz36@gmail.com

Abstract: In this paper a necessary and sufficient condition is deduced for the close-to-convexityof a cross-product of Bessel and modified Bessel functions of the first kind and their derivatives by using a result of Shah and Trimble about transcendental entire functions with univalent derivatives and Mittag-Leffler expansions of this crossproduct, as well as a slightly modified version of a result of Lorch on the monotonicity of the zeros of the cross-product with respect to the order.

Keyword: Bessel Functions of the First Kind, Modified Bessel Functions of the First Kind, Close-to-Convex Functions, Starlike Functions, Zeros of Cross-Product of Bessel Functions, Mittag-Leffler Expansions.

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Existence Criteria of Three Positive Solutions to Boundary Value Problems for p-Laplacian Dynamic Equations on Time Scales

Abdulkadir Dogan[1], Bunyamin Aydin[2]
[1]Department of Applied Mathematics, Faculty of ComputerSciences,
Abdullah Gul University, Kayseri, Turkey
[2]Necmettin Erbakan Universitesi,
Ahmet Kelesoglu Egitim Fakultesi ,
Konya, Turkey
abdulkadir.dogan@agu.edu.tr,baydin@konya.edu.tr.

Abstract: The study of dynamic equations on time scales goes back to its founder Stefan Hilger [1], and is new area of still fairly theoretical exploration in mathematics. In the recent years, boundary value problems for dynamic equations on time scales have received considerable attention. The usual notation and terminology for time scales as can be found in [2] will be used here. Agarwal and O'Regan [3] studied the existence of one or more solutions to nonlinear equations on time scales. They established by using either a nonlinear alternative of Leray-Schauder type or Krasnoselski's fixed point theorem in a cone. Anderson [4] established the existence of multiple positive solutions to the nonlinear second-order three-point boundary value problem on a time scale. He employed the Leggett-Williams fixed-point theorem in an appropriate cone to guarantee the existence of at least three positive solutions. He [5] considered the existence of at least double positive solutions of three-point boundary value problems for p-Laplacian dynamic equations on a time scale by applying a new double fixed-point theorem. In this paper, we consider existence criteria of three positive solutions of three-point boundary value problems for p-Laplacian dynamic equations on time scales. To show our main results, we apply the well known Leggett-Williams fixed-point theorem.

Keywords: Time Scales, Boundary Value Problem, p-Laplacian, Positive Solutions, Fixed Point Theorem

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A Study on Some New Results Arising from (*p,q*)-Calculus

Ugur Duran[1,*], *Mehmet Acikgoz*[2] *and Serkan Araci*[3]
[1]*Department of Mathematics, Faculty of Arts and Science, University of Gaziantep, TR-27310 Gaziantep, Turkey*
duran.ugur@yahoo.com
[*]*Corresponding Author*
[2]*Department of Mathematics, Faculty of Arts and Science, University of Gaziantep, TR-27310 Gaziantep, Turkey*
acikgoz@gantep.edu.tr
[3]*Department of Economics, Faculty of Economics, Administrative and Social Science, Hasan Kalyoncu University, TR-27410 Gaziantep, Turkey*
mtsrkn@hotmail.com

Abstract: In this paper, we give some new investigations and results associated with post quantum calculus, denoted *(p,q)*-calculus. We develop the theory of the *(p,q)*-analogue of the chain rule for *(p,q)*-derivative. Also, we introduce a new *(p,q)*-analogue of the exponential function and investigate some its properties, and using this function, we derive the addition property for *(p,q)*-exponential functions. We also derive many useful results involving *(p,q)*-binomial coefficients and *(p,q)*-antiderivative. Finally, we consider *(p,q)*-analogue of some elementary functions including trigonometric functions and hyperbolic functions and research their properties and relations between them. This may be a good consideration in developing the *(p,q)*-calculus in combinatorics, number theory and other fields of mathematics.

Keywords: *q*-Calculus; *(p,q)*-Calculus; *(p,q)*-Exponential Functions; Trigonometric Functions; Hyperbolic Functions.

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Upper and Lower Solutions for Fourth Order Boundary Value Problems

Serife Müge Ege
Department of Mathematics, Ege University,
Bornova, Izmir, Turkey
serife.muge.ege@ege.edu.tr

Abstract: In this work, existence of unbounded solutions for fourth order three point boundary value problem on a half line is handled. For this purpose Schauder's fixed point theorem and upper-lower solution method are applied. Sufficient conditions are given for existence of at least one solution and at least three solutions. An illustrative example is given to show the importance of results.

Keywords: Three Point Boundary Value Problem, Upper and Lower Solutions, Schauder's Fixed Point Theorem.

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Invariant Subspace Analysis of the Fractional Modifed Kuramoto-Sivashinsky Equation

E. H. El Kinani[1, 2]
[1]*A.A Group, Mathematical Department Moulay Ismïıl University, Faculty of Sciences and Technics Errachidia, BP 509, Morocco.*
[2]*Université Moulay Ismaïl Ecole Nationale Supérieure des Arts et Métiers (ENSAM), Marjane 2, B.P. 15290, Meknès, Maroc.*

Abstract: In this work, the invariant subspace method [1,2] is applied to the time fractional modified Kuramoto-Sivashinsky partial differential equation [3]. The obtained reduced system of nonlinear ordinary fractional equations is solved by the Laplace transform method and with using of some useful properties of Mittag-Leffler function[4]. Then, some exact solutions of the time fractional nonlinear studied equation are found.

Keywords: Invariance Subspace Method, Caputo Fractional Derivative, Fractional Modified Kuramoto-Sivashinsky Equation, Mittag-Lefller Function.

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On the Study of the Holditch Theorem for the Non-Linear Three Points in C_p

Tulay Erisir and Mehmet Ali Gungor
Department of Mathematics, Sakarya University,
Sakarya, Turkey
tsoyfidan@sakarya.edu.tr , agungor@sakarya.edu.tr

Abstract: The generalized complex number system and generalized complex plane were studied by Yaglom[1,2] and Harkin[3]. The Steiner area formula and the Holditch theorem giving the relationship between the areas formed by linear points in the generalized complex plane C_p were given by Erisir[4]. In this paper, we study using non-linear points a new generalization of the Holditch theorem given by [4] in the generalized complex plane C_p. While we obtain the Holditch theorem, we use the the length of the enveloping curves of lines formed by points.

Keywords: Generalized Complex Number, Generalized Complex Plane, Holditch Theorem

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The Stability Analysis of a Delay Differential Equation with State Dependent Delay

Sertac Erman, Ali Demir
Department of Mathematics, Kocaeli University, Umuttepe, 41380 Izmit - Kocaeli, Turkey
106133002@kocaeli.edu.tr, ademir@kocaeli.edu.tr

Abstract: In this paper, we investigate the stability of a differential equation with state-dependent delay under some conditions on delay term. New neccesary and sufficient criterions are elaborated for the asymptotic stability of the differential equations with state dependent delay. Moreover, the asymptotic stability of it is illustrated for a special delay function
Keywords: Asymptotic Stability, State Depended Delay, Delay Differential Equation.
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Generation of the Trigonometric Cubic B-Spline Collocation Solutions for Generalized Burgers-Fisher Equation

Ozlem Ersoy, Idris Dag
Department of Mathematics-Computer, Eskişehir Osmangazi University, Eskişehir, Turkey
ozersoy@ogu.edu.tr

Abstract: In this study Generalized Burgers-Fisher equation which includes several known evolution equations as particular cases has been solved numerically using the collocation finite element method, based on Crank Nicolson for the time integration and trigonometric cubic B-spline functions for the space integration. The accuracy of the method is measured by calculating the discerete error norms between the analytical and numerical solutions.
Keywords: Finite Element Method, Collocation Method, Trigonometric Cubic B-Spline, Generalized Burgers-Fisher Equation.
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An Exponential Cubic B-Spline Finite Element Method for Solving the Nonlinear Coupled Burgers' Equation

Ozlem Ersoy, Idris Dag
Department of Mathematics-Computer, Eskişehir Osmangazi University, Eskişehir, Turkey
ozersoy@ogu.edu.tr

Abstract: The exponential cubic B-spline functions together with Crank Nicolson are used to solve numerically the nonlinear coupled Burgers' equation using collocation method. This method has been tested by three different problems. The proposed scheme is compared with some existing methods. We have noticed that proposed scheme produced a highly accurate results.
Keywords: Finite Element Method, Collocation Method, Exponential Cubic B-Spline, Coupled Burgers' Equation.
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On Weakly Sections in Sequence Spaces

*Merve Temizer Ersoy, Hasan Furkan, Bilal Altay **
Department of Mathematics, Kahramanmaras Sutcu Imam University, Kahramanmaras, Turkey
mervetemizer@hotmail.com, hasanfurkan@hotmail.com
**Department of Primary Education, Inonu University, Malatya, Turkey*
bilal.altay@inonu.edu.tr

Abstract: The n-th section of a sequence $x = (x_k)$ is the sequence $\sum_{k=1}^{n} x_k e^k$, where e^k is the sequence with 1 in the k-th position and 0 elsewhere. The sectional convergence (AK), boundedness (AB), weak convergence (SAK), functional sectional convergence (FAK), unconditionally bounded (UAB), unconditionally section convergence (UAK) and other sectional property were examined [1-6].

In this paper we deal with the weakly absolutely convergence, weakly bounded and weakly bounded variation sections of a sequence in sequence spaces. Then we give some relation between classical sectional property and weakly sections in sequence spaces.

Keywords: Topological Sequence Space, Weakly Absolutely Convergent Series, Weakly Bounded Variation Series, FK Spaces, BK Spaces.

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Dispersive Properties of Conservative Schemes for Three Coupled Nonlinear Schrödinger Equation

Sevim Ertug and Ayhan Aydın
Department of Mathematics, Atılım University,
Incek, Ankara, Turkey
ayhan.aydin@atilim.edu.tr

Abstract: Three coupled nonlinear Schrödinger (3-CNLS) equation is a system of partial differential equation (PDE) with second order dispersion and cubic nonlinearity. It has some conserved quantity such as the mass (or charge) and energy. We have proposed two numerical methods that preserve the discrete version of mass and the energy of the equation. The recent growth in the field of numerical solution of PDE has led to the development of numerical methods that preserve qualitative structure of the equation. However, litte attention has been given to the dispersive properties of the PDE and its numerical solution. Numerical errors in the dispersion relation and the group velocities can lead to the propagation of the numerical wave with different velocity and can lead to spurious solutions. Therefore, it is important to preserve the sign of the group velocity in order to understand the behavior of the numerical solution. In this study, we examine the dispersive properties of the mass and energy conserving numerical methods for the 3-CNLS equation.

Keywords: Three Coupled Nonlinear Schrödinger Equation, Geometric Integration, Dispersion.

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A Model of Nickel-Iron Alloy Electrodeposition on Rotating Disk Electrode: the Global Existence in the Quadratic Case

Nadia Idrissi Fatmi
Laboratory LIPOSI, ENSA KHOURIBGA
Hassan I University
Settat, Morocco
nadidrissi200133@gmail.com

Abstract: To better understand the nickel-iron electrodeposition process, we are interested in the one-dimensional model. This model addresses dissociation, diffusion, electomigration, convection and deposition of multiple ion species. We study the global existence of solutions that are here different ion concentrations in the mixture as well as the electric potential. The classic techniques, based on the C^{α} estimations, to prove the existence and the positivity of solutions fall in defect and news techniques must be developed. We present them here and we obtain global existence and positivity of classical solution for our model in the quadratic case, without any restriction of growth on the non linear terms.

Keywords: Poisson--Nernst--Planck Equations, Electrochemical Systems, Butler--Volmer Reaction Kinetics, Classical Solution.

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Mathematical Analysis for a Class of Quasilinear Elliptic Equations with Nonlinearity in the Gradient and L^1-Data

Nadia Idrissi Fatmi
Laboratory LIPOSI, ENSA KHOURIBGA
Hassan I University
Settat, Morocco
nadidrissi200133@gmail.com

Abstract: In this paper we show the existence of weak solutions for some quasilinear elliptic equations with Dirichlet boundary conditions. The nonlinearity we consider here has critical growth with respect to the gradient and the data is in L^1.

Keywords: Quasilinear Elliptic Equations, Weak Solution, Dirichlet Boundary Condition, Critical Growth with Respect to the Gradient.

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Homoclinical Structure of Hybrid Systems with Impacts

Mehmet Onur Fen[1], Fatma Tokmak Fen[2]
[1]Department of Mathematics,Middle East Technical University,
06800 Ankara, Turkey
monur.fen@gmail.com
[2]Department of Mathematics,Gazi University,
Teknikokullar, 06500 Ankara, Turkey
fatmatokmak@gazi.edu.tr

Abstract: In this study, we investigate the homoclinical structure of impulsive systems which are influenced by a discrete map with homoclinic and heteroclinic orbits. An example supporting the theoretical results is presented.
Keywords: Hybrid Systems, Homoclinic Motion, Heteroclinic Motion.
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Multiple and Nodal Solutions for Nonlinear Problems

Michail E. Filippakis
Department of Digital Systemss, University of Piraeus,
Piraeus, Greece
mfilip@unipi.gr

Abstract: We consider a nonlinear elliptic Neumann problem driven by a nonhomogeneous differential operator, which is strictly monotone and incorporates as special cases the p-Laplacian, the (p,q)-differential operator and the generalized p-mean curvature differential operator. Using variational methods coupled with suitable truncation and comparison techniques and Morse theory (critical groups), we prove the existence of at least three nontrivial smooth solutions, one positive, the second negative and the third nodal.

Keywords: Nonhomogeneous Differential Operator, Nonlinear Regularity, Nonlinear Strong Maximum Principle, Extremal Constant Sign Solutions, Nodal Solution, Local Minimizer.

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Estimation of the Scatter Matrix of an Elliptically Symmetric Distributions. Orthogonally Invariant Estimators.

Dominique Fourdrinier, Fatiha Mezoued and Martin T. Wells
Université de Rouen, France, Ecole Nationale de Statistique et d'Economie Appliquée, Alger, Algeria
Cornell University, USA
dominique.Fourdrinier@univ-rouen.fr, famezoued@yahoo.fr, mtw1@cornell.edu

Abstract: Let $(X, U) = (X, U_1, \dots, U_n)$ be n +1 random vectors having an elliptically contoured distribution with joint density of the form

$$|\Sigma|^{-(n+!)/2} \; f\left((x-\theta \qquad)^t \Sigma^{-1}(x-\theta) + \sum_{i=1}^{n} u_i^t \Sigma^{-1} u_i \right)$$

Where X and U_i 's are $p \times 1$ vectors and $S = UU^t$ and both θ and Σ^{-1} are unknown. We provide orthogonally invariant estimators of the precision matrix $\sum$. According to the fact that the matrix S is invertible or not, natural estimators are of the form
aS^{-1} or aS^{+} where a is a positive constant and where S^{-1} and S^{+} are respectively the inverse and the Moore-Penrose inverse of S. We propose improved estimators under the loss $tr\left(\left(\hat{\Sigma}^{-1} - \Sigma^{-1}\right)^2\right)$. So here, we generalize the works in [1], [2],[3] ,[4] which dealt with the Gaussian case.

Keywords: Elliptically Symmetric Distributions; Precision Matrix; Berger Class.

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New Summability Method and Its Applications

*Mubariz T. Garayev**, Mehmet Gurdal*, Ulas Yamanci**
**Department of Mathematics, Suleyman Demirel University, Isparta, Turkey*
***Department of Mathematics, College of Science, King Saud University, Riyadh, Saudi Arabia*
mgarayev@ksu.edu.sa, gurdalmehmet@sdu.edu.tr
ulasyamanci@sdu.edu.tr

Abstract: By using Berezin symbol technique, we prove some results for Borel summability. Also, we give a Tauberian type theorem for Borel summability.
Keywords: Borel Summabiliy, Berezin Symbol, Diagonal Operator, Fock Space.
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Some New Ideal Convergent Double Sequence Spaces and Weighted Lacunary I-Statistical Convergence for Double Sequences

Ergin Genc[1] *and Sukran Konca* [2]
Department of Mathematics, Bitlis Eren University,
13000, Bitlis, Turkey
ergin_genc44@hotmail.com; skonca@beu.edu.tr

Abstract: In this work, we aim to introduce some new double ideal convergent sequence spaces and investigate some of their topological paraperties.
Keywords: I-Statistical Convergence, Ideal Convergence, Weighted Mean, Double Sequence, Sequence Space.
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Linear Combinations of L-Functions Satisfying the Same Riemann-Type of Functional Equation

Dorin Ghisa
Department of Mathematics, Glendon College, York University
Toronto,Canada
dghisa@yorku.cam

Abstract: Linear combinations of L-functions satisfying Riemann-type of functional equations do not preserve in general this property. One important example in which the property is preserved is that of the Davenport and Heilbronn function, which represents a very particular linear combination of two very particular L-functions satisfying different functional equations. Its importance resides in the fact that off critical line non trivial zeros have been found for this function. In this paper are showing that infinitely many similar functions can be obtained and the question of multiplicity of the zeros of those functions is answered. On the other hand, if some linearly independent L-functions satisfy the same Riemann-type of functional equation, then any linear combination of them will satisfy the respective equation. The following question is answered. Suppose that all those functions satisfy RH. Is it possible to find a linear combination of them exhibiting off critical line non trivial zeros ?

Common Fixed Points of (α,β)-Implicit Graph Contraction via Cyclic Admissible Pair in Modular Spaces

Ekber Girgin, Mahpeyker Ozturk
Department of Mathematics, Sakarya University,
Sakarya, Turkey
girginekber@hotmail.com, mahpeykero@sakarya.edu.tr.

Abstract: Motivated by Aydi et al. (RACSAM, 109:367-384, 2015), we introduce the notion of (α,β)-implicit graph contraction in the setting of modular spaces. Further, the obtained results encompass various generalizations of implicit contractions.
Keywords: Implicit Contraction, Cyclic Admissible Pair, Common Fixed Point.
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Improvement of a Secure Authentication Scheme for Session Initiation Protocol Based on ECC

Debasis Giri[1], Tanmoy Maitra[2] and P. D. Srivastava[3]

[1]Department of Computer Science and Engineering
Haldia Institute of Technology, Haldia-721657, India
[2]Department of Computer Science and Engineering
Jadavpur University, Kolkata, West Bengal-700032, India
[3]Department of Mathematics
Indian Institute of Technology Kharagpur
Kharagpur-721302, India
debasis_giri@hotmail.com, tanmoy.maitra@live.com, pds@maths.iitkgp.ernet.in

Abstract: In 2015, Chaudhry *et al*. proposed asmart card based authentication scheme to remove the security loopholes of Tu *et al*.'s scheme. However, this paper shows that Chaudhry *et al*.'s scheme has inefficient login and password change phases, and does not preserve user's anonymity. Therefore, this paper proposes an improved scheme to eliminate the aforementioned drawbacks. After performing analysis, this paper states that the proposed scheme is efficient and has batter tradeoff among several measurement costs along with security.

Keywords: Smart Card, Password, Attack, Authentication, Elliptic Curve, Session Initiation Protocol.

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Lower Envelopes in Vector Spaces

Nihat Gokhan Gogus
Sabancı University,
Istanbul, Turkey
nggogus@sabanciuniv.edu

Abstract: The lower envelopes of certain functions appear quite naturally in functional analysis, extremal and dual extremal problems, optimization, in the theory of uniform algebras and in potential theory. This notion was used in [1] in a very special form in the context of pluripotential theory. We investigate the continuity properties of lower envelopes in the abstract setting of infinite dimensional spaces. One can start with any set in a topological space A and assign to each point a in this set a fiber J_a, that is, a class of elements from the dual space X^* of some vector space X. Then one can construct a new function on A via lower envelopes by taking the infimum over all numbers of the form Re (x^*,x), where x in X is fixed, and x^* changes over the fiber J_a for any a in A. Let $(x^*,x)_a$ be the optimal value. For example, one can think of x as a function which we minimize subject to some set of constraints J_a, where a runs in some sample space A. We completely characterize conditions which guarantee global or local continuity in A of these optimal values $(x^*,x)_a$.

Keywords: Extremal and Dual Extremal Problems, Lower Envelopes.

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Matrix Operators on the Series Space $\left|\overline{N}_p^{\theta}\right|(\mu)$ and Applications

Fadime Gökce, Mehmet Ali Sarıgol
Department of Mathematics, Pamukkale University,
Denizli, Turkey
fgokce@pau.edu.tr

Abstract: In the study, we introduce the notion of generalized absolute summability method which includes almost well known summabilities. By showing that series space $\left|\overline{N}_p^{\theta}\right|(\mu)$ is a FK-space with AK-property with respect to its natural paranorm. We characterize some matrix operators on the space.

Keywords: Absolute Weighted Summability, Matrix Transformations, Sequence Space, Bounded Operators.

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Numerical Investigation on the Effect of the Rotation Intensity of a Tornadic Wind

Xixiong Guo, Jun Cao
Department of Mechanical and Industrial Engineering, Ryerson University, Toronto, Ontario, Canada
jcao@ryerson.ca

Abstract: A tornadic wind is essentially considered as an airflow that simultaneously translates and rotates. Numerical simulations of this kind of hybrid flow remain inadequate due to many numerical difficulties, one of the major challenges consisting in the establishment of a set of boundary conditions that are, for the tornado-obstacle interaction scenario, both rational in physics and simple in numerical implementation. Inspired by the success of immersed-boundary (IB) lattice Boltzmann method (LBM) for simulations of fluid-structure interaction problems, this study proposes a new outlet of the IB-LBM framework for investigation of tornadic wind effects, featuring a reformed interpretation of the Rankine-Combined Vortex Model (RCVM) that considerably facilitates the boundary condition setup. Moreover, the main purpose of this study is to examine the tornadic wind loadings in relation to the rotation intensity of a tornado, and presents a practical Newton's bi-section-like method for determining the critical rotation intensity beyond which the aerodynamic coefficients no longer increase when Reynolds number rises. This critical rotation intensity serves to characterize tornadic winds, such that the tornado with a rotation density below its critical value can be considered as mainly dominated by the translation part and, otherwise, the dominance no longer belongs only to the translational component of the tornado. Since it has been rather conventional that, when studying tornadoes, Reynolds number is determined using only the translation velocity as characteristic velocity, the present tornado study intends to suggest, through a number of numerical test series, that more attention be paid to the insufficiently explored rotational component, which physically tends to play a more dominant role when an intensive rotation is present in a tornado scenario.

Keywords: Tornadic Wind; Rankine-Combined Vortex Model; Immersed Boundary Lattice Boltzmann Method (IB-LBM); Rotation Intensity; Wind Loads; Aerodynamic Coefficients.

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Compact Finite Difference Solutions of Soybean Hydration Model as Stefan Problem

Seda Gulen[1,2],Turgut Ozis[1]
[1]Department of Mathematics, EgeUniversity, Bornova,İzmir, Turkey
[2]Department of Mathematics,Namık Kemal University, Merkez,Tekirdağ,Turkey
[1]sedagulenn@gmail.com

Abstract: Many physical problems arising in engineering and science include volume variation or movement of system boundaries. The mathematical description of these problems can be expressed by moving boundary problems or Stefan problems. Soybean hydration model is considered as a Stefan problem with a one moving boundary or two moving boundaries.
In this work, we present numerical solutions of soybean hydration model has one moving boundary which expresses the movement of radius and variable diffusivity coefficient. The solutions are obtained by using boundary immobilization method combined with compact finite difference schemes. Numerical results are compared Nicolin, et al. [1] and obtained good agreement with minimal computational effort.
Keywords: Finite Differences, Compact Schemes, Stefan Problem, Hydration Model
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Enneper-Type Surfaces in Three Dimensional Minkowski Space

Erhan Guler, Semra Saracoglu Celik, Omer Kisi
Department of Mathematics, Bartın University,
Bartın, Turkey
ergler@gmail.com, ssaracoglu@bartin.edu.tr, okisi@bartin.edu.tr

Abstract: In this work, we study on an Enneper-type minimal surfaces using Weierstrass representation in the three dimensional Minkowski space. We compute implicit equations, degree and class of the surfaces.
Keywords: Enneper Surface, Minimal Surface, Weierstrass Representation, Degree, Class.

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A Banach-Stone Type Theorem for Isometries on L^p Spaces

Banu Gunturk
Faculty of Engineering, Baskent University,
Ankara, Turkey
bgunturk@baskent.edu.tr

Bahaettin Cengiz
Faculty of Engineering, Baskent University,
Ankara, Turkey
bcengiz@baskent.edu.tr

Abstract: In this article we prove that for any positive measure μ and a real number p, $1 \leq p < \infty$, $p \neq 2$, there is a one-to-one correspondence between the set of all surjective linear isometries on the Banach space $L^p(\mu)$ and the set of all onto homeomorphisms on the Stonean space of the measure algebra the given measure space determines. To be more specific, we extend the well-known Banach-Stone theorem for spaces of scalar continuous functions to L^p spaces.
Keywords: Isometries of L^p Spaces, Banach-Stone Theorem, Complete Boolean Algebra, Topological Homeomorphism.

On Some Codes Over R_2

Murat Guzeltepe, Alev Altinel
Department of Mathematics, Sakarya University,
Esentepe, Sakarya, Turkey
mguzeltepe@sakarya.edu.tr, *alevaltinell@gmail.com*

Abstract: Linear codes over rings have played an increasingly prominent role in the coding theory literature due to the fact that they are easier to construct, encode and decode since the publication of [1] classifying codes over $\mathbb{Z}_4$. A method was given in [1] that it leads to a new direction in coding theory. Since then, many types of finite rings have been studied in coding theory by using the same method, i.e., by introducing a Gray map to obtain a connection between $\mathbb{Z}_4$-codes and their binary images. Some of these publications are about $\mathbb{Z}_{2^k}$-linear codes [2], Type II codes over $\mathrm{F}_2 + u\mathrm{F}_2$ [3], etc. Also, cyclic codes over rings studied by many authors ([4], [5], [6]). All of the rings have a common case, which is all finite chain and also principal ideal ring. Studying over a finite chain give you a chance to define generator and check matrices for the codes in standard forms as in [7]. On the other hand, the ring $\mathrm{F}_2 + u\mathrm{F}_2 + v\mathrm{F}_2 + uv\mathrm{F}_2$ have been studied in [8] and [9] aparts from the others since it is neither a finite chain nor principal.

Let R_2 denotes the ring $\mathrm{F}_2 + u\mathrm{F}_2 + v\mathrm{F}_2 + w\mathrm{F}_2 + uv\mathrm{F}_2 + uw\mathrm{F}_2 + vw\mathrm{F}_2 + uvw\mathrm{F}_2$ throughout this paper. The ring R_2 has two important properties, which the ring is neither finite chain nor principal ideal ring. In this paper, linear and cyclic codes are studied over the ring R_2. Initially, the structure of the ring R_2 is examined and linear codes are defined over this ring. The ideal decomposition of linear codes over R_2 are obtained. Moreover, Lee weight and a Gray map are defined for these codes. The R_2-linearity of binary codes over the ring R_2 and the codes corresponding to pre-images of Reed Muller codes are given. Also, the dual codes and the complete weight enumerators are defined for R_2-linear codes. Furthermore, cyclic codes over R_2 are characterized when n is odd.

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Closure Algebras of Metric Spaces

Ahmet Hamal
Department of Mathematics, Ege University,
Bornova, lzmir, Turkey
ahmet.hamal@ege.edu.tr

Abstract: We will be mainly concerned with the Theorem of McKinsey and Tarski in [3] which says: The closure algebra of a separable metric space with no isolated points is dissectable. We explain that the proof given in [3] for this theorem has a gap. Then, we give the proofs of a more general theorem in [5] and a special case of the theorem in [4] by use of a simple and precise language.

Keywords: Separable Metric Space, Dissectable Closure Algebra, Isolated Point.

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Positive Solutions for Semipositone Fractional Boundary Value Problems

Nuket Aykut Hamal, Fulya Yoruk Deren, Tugba Senlik Cerdik
Department of Mathematics, Ege University,
Izmir, Turkey
nuket.aykut@ege.edu.tr, fulya.yoruk@ege.edu.tr, tubasenlik@gmail.com

Abstract: This paper deals with the existence of positive solutions for boundary value problems of semipositone fractional differential equations. The arguments are based upon a fixed point theorem in cones.
Keywords: Fractional differential equations, positive solutions, semipositone.
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On k −Quasi Class Q^*Operators

Valdete Rexhëbeqaj Hamiti, Shqipe Lohaj and Qefsere Gjonbalaj
Faculty of Electrical and Computer Engineering, University of Prishtina "Hasan Prishtina", Prishtinë, 10000, Kosova
valdete_r@hotmail.com, shqipe.lohaj@uni-pr.edu, qefsere.gjonbalaj@uni-pr.edu

Abstract: Let T be a bounded linear operator on a complex Hilbert space H. In this paper we introduce a new class of operators: k −quasi class Q^*operators. An operator T is said to be k −quasi class Q^*if it satisfies $\|T^{*}T^{k}x\|^2 \leq \frac{1}{2}(\|T^{k+2}x\|^2 + \|T^{k}x\|^2)$, for all $x \in H$, where k is a natural number. We prove the basic properties of this class of operators. We proved that T is operator of k −quasi class Q^* if and only if $T^{*k}(T^{*2}T^2 - 2TT^* + I)T^k \geq 0$. We give the relation between this class of operator and the class of k −quasi $-*-$ paranormal operator, the relation between this class and the class Q^* operator. Morever, we proved that, for every operator T if $\|T^*\| \leq \frac{1}{\sqrt{2}}$, then T is operator of k −quasi class Q^*.

Keywords: k −Quasi Class Q^*, k −Quasi $-*-$Paranormal, Class Q^*.

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General Robin Boundary Value Problems for Elliptic Operational Differential Equations with Variable Operators

Rabah Haoua and Ahmed Medeghri
Laboratoire de Mathématiques Pures et Appliquées, Université de Mostaganem 2700, Algérie
Haoua.rabah27@gmail.com ahmed_medeghri@yahoo.com

Abstract: In this paper we give some new results on abstract second order differential equation of elliptic type with variable operator coefficients and general Robin boundary conditions, in the framework of Hölder spaces. Here, we do not assume the differentiability of the operators resolvent. However, we suppose that the family of variable operators verifies the Labbas-Terreni assumption inspired by the sum theory and similar to the Acquistapace-Terreni one. We use Dunford calculus, interpolation spaces and semigroup theory in order to obtain existence, uniqueness and maximal regularity results for the solution of the problem.

Keywords: Abstract Differential Equation of Elliptic Type, Robin Boundary Conditions, Analytic Semigroup, Maximal Regularity, Dunford Operational Calculus.

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Solutions of Fuzzy Fractional Heat-Like and Wave-Like Equations by Variational Iteration Method

Atimad Harir, Said Melliani, L. Saadia Chadl
Department of Mathematics, Faculty of Sciences and Technics University,
Beni Mellal, Morocco
atimad.harir@gmail.com

Abstract: This paper applies the sufficient condition for the Buckley-Feuring solution to exist by the variation iteration method are used for find the exact fuzzy solution of the fuzzy fractional heat-like and wave-like equations with variable coefficients and fuzzy parameters. Some examples are given to show the reliability and the efficiency of the sufficient condition.
Keywords: Fuzzy Fractional Heat-Like and Wave-Like Equations, Variational Iteration Method, Fuzzy Number.
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Absolute Cesàro Series Spaces and Matrix Operators

G. Canan Hazar, M. Ali Sarıgöl
Department of Mathematics, Pamukkale University,
Denizli, Turkey
gchazar@pau.edu.tr, msarigol@pau.edu.tr.

Abstract: In this paper we derive a series space $|C_{\lambda,\mu}|_k$ using the well known absolute Cesàro summability $|C,\lambda,\mu|_k$ of Das [2], compute its β-dual, give some algebraic and topological properties, and characterize matrix operator defined on that space. So we generalize some results of Bosanquet [1], Flett [3], Mehdi [6], Orhan and Sarıgöl [10] and Sarıgöl [7,9].

Keywords: Sequence Spaces, Absolute Cesàro Summability, Matrix Transformations, Dual Spaces, BK Spaces.

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Some New Numerical Approximations for Time Fractional Schrödinger Equations

Betul Hicdurmaz
Department of Mathematics, Istanbul Medeniyet University,
Uskudar, Istanbul, Turkey
betul.hicdurmaz@medeniyet.edu.tr

Abstract: In the present study, a Time Fractional Schrödinger Differential Equation (TFSDE) is considered. Here, it is important to note that increasing number of computational studies on TFSDE is not a surprise due to its physical applications in quantum mechanics.
However, exact solutions of TFSDEs can be given only in terms of special functions and special functions are not easy to analyze or compute. So, numerical approximations for TFSDEs are studied more frequently in recent years ([1]-[3]). In the present study some stable numerical approximations are established for a TFSDE using finite difference method.
Keywords: Finite Difference Scheme, TFSDE, Stability.
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New Numerical Approximations for the Nonlinear Population Model

Betul Hicdurmaz
Department of Mathematics, Istanbul Medeniyet University,
Uskudar, Istanbul, Turkey
betul.hicdurmaz@medeniyet.edu.tr

Emine Can
Department of Physical Engineering, Istanbul Medeniyet University,
Uskudar, Istanbul, Turkey
emine.can@medeniyet.edu.tr

Abstract: Different population models are considered with different numerical approaches in the literature. The present study aims to present a new and efficient numerical method for the nonlinear population model which is based on the polynomial approximations via a pseudospectral approach.
Keywords: Population Dynamics, Polynomial Approximation, Pseudospectral Method.
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Conbinatoric Bijection

Fadila Hocini,
Laboratory of Applied Mathematics,
Department of Mathematics
A/Mira University, Bejaia, Algeria
fadilahocinie@hotmail.fr

Abstract: Our work focus in enumerative combinatoric to determinate card of set of sequence given by (n+1) terms $(x_i)_{i\geq 0}$ such as $x_0 = x_n = 0$, and $d_i = x_i - x_{i-1}$ for $i \in \{-1,0,1\}$, we construct one bijection between two particulars sets. Set of forets (graph) and set of paths (graph).
Keywords: Combinatoric; Foret Graph; Path Graph.

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To Compute Topological Complexity Numbers Using Steenrod Squares

Melih Is and Ismet Karaca*
Department of Mathematics, Ege University,
Bornova, Izmir, Turkey
melihis2010@gmail.com ismet.karaca@ege.edu.tr

Abstract: Topic of this poster is about topological robotics [3] that closely related with algebraic topology [7]. We first introduce the concept of 'topological complexity' number [2], and then give some examples about topological complexity of certain topological structures. One can recall that topological complexity is a numerical homotopy invariant and similar in spirit to the Lusternik-Schnirelmann category 'cat(X)' [1]. We also state some examples about computing topological complexity with using cat(X). After we associate topological complexity number to cohomology operations [4, 5] in this poster, we apply to computing topological complexity some properties of steenrod squares on topological robotics.

Keywords: Topological Complexity, Steenrod Operations, Motion Planning Algorithm, Configuration Spaces, Lusternik-Schnirelmann Theory.

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On Darboux Vector in Lorentzian 5-Space

Esen Iyigun
Department of Mathematics, Uludag University, Görükle, Bursa, Turkey
esen@uludag.edu.tr

Abstract: In this work, we introduce Darboux vector in Lorentzian 5-space. We give some characterizations of the vector in the space. Also, we consider some special cases in the space.
Keywords: Non-Null Curve, Darboux Vector, Lorentzian 5-Space.
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Weak Module (σ,τ)-Amenability of Triangular Banach Algebras of Order Three

Hulya Inceboz, Berna Arslan
Department of Mathematics, Adnan Menderes University,
Aydin, Turkey
hinceboz@adu.edu.tr, byorganci@adu.edu.tr

Abstract: The notion of module amenability for a class of Banach algebras, which could be considered as a generalization of Johnson's amenability, was introduced by M. Amini in [1]. The weak module amenability of triangular Banach algebras of the form

$$T_2 = \left\{ \begin{bmatrix} a & m \\ 0 & b \end{bmatrix} : a \in A, b \in B, m \in M \right\},$$

where A and B are Banach algebras and M is a Banach A,B-module, is studied by A. Pourabbas and E. Nasrabadi in [2], and they showed that the weak module amenability of T_2 is equivalent with the weak module amenability of the corner algebras A and B.

In this work, we investigate the structure of the first module (σ,τ)-cohomology group of the triangular Banach algebra T of order three with coefficients in its dual space T^*. Also we give some theorems related with the module (σ,τ)-amenability and weak module (σ,τ)-amenability of the triangular Banach algebras of order three, and get some results for semigroup algebras.

Keywords: Triangular Banach Algebras of Order Three, Weak Module (σ,τ)-Amenability, Inverse Semigroups.

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Theoretical and Numerical Methods for Two-Phase Flow Modeling

Hyeonseong Jin
Department of Mathematics, Jeju National University,
Jeju, South Korea
hjin@jejunu.ac.kr

Abstract: We are concerned on governing equations and numerical methods describing turbuent fluid mixing behavior effectively. We propose a multiphase closure model for turbulent mixing of compressible fluids. The model closures are validated in a numerical study. Also we study numerical methods of macro and micro phenomena for turbulent fluid mixing driven by acceleration forces. We propose methods for verification and validation of simulations for chaotic, multiscale flows.

Keywords: Multiphase Flow, Turbulence, Numerical Simulations, Averaged Equations

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What is a Multiset?

Helmut Jürgensen
Department of Computer Science and Mathematics,
The University of Western Ontario, London, Canada,
hjj@csd.uwo.ca

Abstract: A set is a collection of distinct elements – what is a multiset? It is a set in which an element can occur several times, a set in which multiple copies of an element can occur. But that is not a set!

The notion of a multiset is useful in many practical situations, but contravenes established mathematical formalisms. In its simplest version, a multiset is specified by a set of pairs $\langle x, m_x \rangle$ where x belongs to some basic underlying set X and m_x is the number of occurrences of x in the multiset. This definition does not distinguish between different occurrences of the element x in the multiset (for instance, there can be 3 students called Peter in a class; they are individuals, but indistinguishable when the class is considered as a multiset). The multiplicity is usually assumed to be a non-negative integer. Multisets are often also called bags in the literature. Multisets in the usual sense are similar to fuzzy sets and finite probability spaces.

Multiplicities are really cardinal numbers -- not just non-negative integers. Operations on multisets need to take this property into account. For finite multiplicities this is not a problem, except when one tries to define the complement of a multiset. For infinite multiplicities, however, even the operations of intersection and union pose a difficulty. To cope with infinite multiplicities and with levels of distinguishability, we propose a substantially different definition of multisets, using families, that is, sets and mappings, as the basic concept. This framework works even when the multiplicity of an element is an arbitrarily large cardinal number. A special case of it reduces to the usual concept, when only finite multiplicities are considered.

The need for a non-standard theory of multisets -- including the case of infinite multiplicities -- arose in our recent research on biologically based computations where several levels of differentiation between individuals in a multiset were required.

We base our definition of multisets on the notion of universe (e.g. in the sense of Grothendieck) and the resulting notions of set, mapping, and family. In this general setting "multiplicity" is a derived notion. We outline options for the definition of operations on multisets and relations between multisets with appropriate examples. We formulate an intuitively motivated set of axioms concerning multisets and show that our concepts satisfy the axioms. The common concept of multisets forms a simple special case.

Keywords: Multisets, Bags, Set theory.

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On the Exact Distribution of the Product of Two Independent Hypoexponential Random Variables

Therrar Kadri
Department of Mathematics, Lebanese International University,
Khyara, Lebanon
therrar@hotmail.com

Khaled Smaili
Department of Appled Mathematics, Lebanese University,
Zahle, Lebanon
ksmeily@hotmail.com

Seifedine Kadry
School of Engineering, American University of the Middle East,
Eguaila, Kuwait
skadry@gmail.com

Ali El-Joubbeh
Department of Pure Mathematics, Lebanese University,
Zahle, Lebanon
ali_joubbeh@ul.edu.lb

Abstract: The product distributions are of interest in many areas of the sciences. The study of the product of same family and finding their exact density expression was examined by many authors. Some solved the problem and others gave approximations. In this paper, we consider the product of two independent Hypoexponential distributions which has many applications in stochastic PERT Network and many others. We find the exact expressions for the probability density function, the cumulative distribution function, moment generating function, the reliability function and hazard function, which was proved to be a linear combination of the K distribution. Finally, we will apply our results application in stochastic PERT Network.

Keywords: Product Distribution, Hypoexponential Distribution; Erlang Distribution; K Distribution; Probability Density Function; Cumulative Distribution Function; Reliability Function; Hazard Function.

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Finite Dimensional Chebyshev Subspaces of Classical Banach Spaces

Aref K. Kamal
Department of Mathematics, Sultan Qaboos University,
Al Khoud 123, Muscat, Oman
akamal@squ.edu.om

Abstract: The set A of the normed linear space X is said to be proximinal in X if for each $x \in X$ there is $y_0 \in A$ such that the distance $d(x, A) = \inf\{\|x-y\|; y \in A\} = \|x-y_0\|$. In this case y_0 is called a best approximation for x from A . The set A is called a Chebyshev subset of X if for each $x \in X$, the best approximation for x from A is unique.

Finite dimensional Chebyshev subspaces were the center of attention of mathematician for some time. In this talk the speaker investigate the existence of finite dimensional Chebyshev subspaces in some classical Banach spaces like ℓ_1, ℓ_∞, $L_1[0, 1]$, and $L_\infty[0, 1]$. Some of the results like the case of $L_1[0, 1]$, is known but the speaker produce an easy proof for it.

Keywords : Chebyshev Subspaces**,** ℓ_1, ℓ_∞, $L_1[0, 1]$, and $L_\infty[0, 1]$, Banach Lattice, Hobby Rice Theorem**.**

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On the Moments of Semi-Markovian Inventory Model When the Demand Distribution Belongs to the General Class of Regularly Varying Distributions with Infinite Variance

A.B.Kamislik[1,], T. Kesemen[2], E.Senol[3]*
[1]Recep Tayyip Erdogan University,
Department of Mathematics, 53020, Rize Turkey.
matheasli@gmail.com
[2,3]Karadeniz Technical University,
Department of Mathematics, 61080 Trabzon, Turkey,
tkesemen@gmail.com,esenol@hotmail.com

Abstract: It is well known that regular variation is one of the important phenomenon encountered in many different areas of applied probability theory. Certainly one of these application areas is investigation of inventory models. There are plenty of studies which provide empirical examples for existence of regularly varying demands. The main purpose of the current study is to investigate the asymptotic behavior of the ergodic moments of the process X(t) which represents a semi-Markovian inventory model when the demands have any arbitrary distribution function from the regularly varying subclass of heavy tailed distributions with tail parameter 1<α<2. Previous studies in the literature the considered process X(t) has been investigated under the assumptions heavy tailed Pareto distributed demand and uniform distributed interference of chance i.e. when the random variables $\{\eta_n\}_{n=1,2,3,\dots}$which represent the amount of demands have Pareto distribution with $\bar{F}(x) = P\{\eta_1 \leq x\} = \left(\frac{b}{x}\right)^{\alpha}, x \geq b, b > 0,$ $1 < \alpha < 2$ [6]. The most important difference of this study from the other studies in the literature is, we investigate the current problem with the class of regularly varying distributions rather than a single distribution like Pareto. In order to obtain renewal function generated by the regularly varying random variables, we used a special asymptotic expansion [5]. We show that considered process is ergodic under some weak conditions. Finally we obtained a general formula which provides two term asymptotic expansion for the n^{th} order moments (n=1,2,3,…) of the ergodic distribution which covers all regularly varying subclass with infinite variance.

Keywords: Semi-Markovian Inventory Model, Regular Variation, Ergodic Moments, Asymptotic Expansion

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Inverse Problem of Elliptic Equation with Nonlocal Boundary Conditions

Fatma Kanca
Department of Management Information Systems, Kadir Has University, 34083, Istanbul, Turkey
fatma.kanca@khas.edu.tr

Abstract: In this paper, the inverse problem of finding a time dependent coefficient in a second order elliptic equation is investigated. The existence and uniqueness of the classical solution of the problem under consideration are established. Numerical tests using the finite-difference scheme combined with an iteration method is presented and the sensitivity of this scheme with respect to noisy overdetermination data is illustrated.

Keywords: Elliptic Equation, Inverse Problem, Nonlocal Boundary Condition, Integral Overdetermination Condition.

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Groebner Shirshov Basis of Aut (Fn) for the Word Problem

Esma Kangal, Nurten Urlu, Ahmet Sinan Cevik*
Department of Mathematics, Selçuk University,
Selçuklu, Konya, Turkey
esmakangal@selcuk.edu.tr, n.urlu91@gmail.com.tr,
sinan.cevik@selcuk.edu.tr

Abstract: In combinatorial group theory, Max Dehn introduced the decision problems such as the word problem, the conjugacy problem and the isomorphism problem in 1911. Especially, there are many studies on the word problem [1], [2], [3] in the literature. Novikov and Boone show that there exists a finitely presented group whose word problem is recursively unsolvable. Therefore to show a finitely presented group has solvable word problem is important. In here, we study on the word problem of the automorphism group Aut(Fn) of a free group with rank n. In particular, we use the method of Groebner Shirshov basis by using the presentation Aut(Fn) given by [4] to solve this problem.

Keywords: Word Problem, Automorphism Group of a Free Group, Rewriting System.

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The Existence of Positive Solutions for Fractional-Order Boundary Value Problems on Finite Interval

Ilkay Yaslan Karaca and Serenay Abali
Department of Mathematics, Ege University,
Bornova, Izmir, Turkey
ilkay.karaca@ege.edu.tr, serenayabal@gmail.com

Abstract: In this study, five functionals fixed point theorem and Guo-Lakshmikantham fixed point theorem are used to research the existence of positive solutions for fractional-order nonlinear boundary value problems on finite interval. As applications, the examples are given to illustrate the main results.

Keywords: Fractional, Positive Solution, Finite Interval, Five Functionals Fixed Point Theorem, Guo - Lakshmikantham Fixed Point Theorem.

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Positive Solutions of Impulsive Time-Scale Boundary Value Problems with p-Laplacian on the Half-Line

Ilkay Yaslan Karaca and Aycan Sinanoglu
Department of Mathematics, Ege University,
35100 Bornova, Izmir, Turkey
ilkay.karaca@ege.edu.tr aycansinanoglu@gmail.com

Abstract: Boundary value problem on infinite intervals appear often in applied mathematics and physics. There are many papers concerning the existence of solutions on the half-line for the boundary value problem, see [1-8]. Due to the fact that an infinite interval is noncompact, the discussion about boundary value problem on the half-line is more complicated, in particular, for p- Laplacian impulsive boundary value problem on infinite intervals, few works were done, see [5]. Especially, the corresponding theory for m-point impulsive boundary value problem on infinite interval on time scale is not investigated till now. In this study, four functionals fixed point theorem is used to investigate the existence of positive solutions for second-order time-scale boundary value problem of impulsive dynamic equations on the half-line.

Keywords: Four Functionals Fixed Point Theorems, Impulsive Dynamic Equation, Positive Solutions, Boundary Value Problems, Time Scale.

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The Existence of Positive Solutions for Fractional-Order Nonlinear Boundary Value Problems on Infinite Interval

Ilkay Yaslan Karaca and Dondu Oz
Department of Mathematics, Ege University,
35100 Bornova, Izmir, Turkey
ilkay.karaca@ege.edu.tr, *donduayhan@gmail.com*

Abstract: In this study, six functionals fixed point theorem and Leray-Schauder nonlinear alternative theorem are used to investigate the existence of positive solutions for fractional-order nonlinear boundary value problems on infinite interval. As applications, the examples are given to illustrate the main results.
Keywords: Fractional, Infinite Interval, Six Functionals Fixed Point Theorem, Leray-Schauder Nonlinear Alternative Theorem.
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Some Properties of Digital Persistent Homology Groups

Ismet Karaca and Ozgur Ege
Department of Mathematics, Ege University, Bornova, Izmir, Turkey
Department of Mathematics, Celal Bayar University, Muradiye, Manisa, Turkey
ismet.karaca@ege.edu.tr, ozgur.ege@cbu.edu.tr

Abstract: Digital topology is a growing area with significant properties in mathematics. In this theory, digital homology groups were defined in [1] and extended in [2]. Then it was given a different approach and some properties for digital homology groups [3,4]. Digital persistent homology is a way to describe some properties of a digital image (X,κ) with filtration and can be viewed as an extension of digital homology groups. In this talk, we introduce some properties of the digital persistent homology groups and calculate digital persistent homology groups of some digital images.

Keywords: Digital Image, Persistent Homology, Image Processing.

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Calibration Problem with Unknown Operator

Belaide Karima
Laboratory of Applied Mathematics,
Department of Mathematics
A/Mira University, Bejaia, Algeria
k_tim2002@yahoo.fr

Abstract: In this paper, we consider a linear equation Ax=u, where A is a unknown compact operator in Hilbert space H_{1}. To solve this problem arising from many experimental fields of science, we propose an iterative method with Gaussian errors which converges almost completely.
Keywords: Inverse Problem; Linear Operator; Tikhonov Regularization; Iterative Method.
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Euler-Lagrange Dynamical Equations on 3-Dimensional Normal Almost Contact Geometry

Zeki Kasap
Faculty of Education, Department of Elementary Education, Pamukkale University, Denizli/ Turkey
zekikasap@hotmail.com

Abstract: We consider Euler-Lagrange equations on almost contact manifolds. On the other hand, one way of solving problems in classical and analytical mechanics is through use of the Euler-Lagrange equations. The purpose of the present paper is to solve the problems of classical mechanics with 3-dimensional real number space on an almost contact manifold by using Euler-Lagrange equations.

Keywords: Paracontact Manifold, Mechanical System, Dynamic Equation, Lagrangian Formalism.

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Weyl-Euler-Lagrange Movement Equations on Almost Paracontact Metric Manifold

Zeki Kasap
Faculty of Education, Department of Elementary Education, Pamukkale University, Denizli/ Turkey
zekikasap@hotmail.com

Abstract: A preferred method to solve the problems of classical mechanics is using the Lagrangian mecanics. Classical field theory uses a simple solution method of Euler-Lagrangian dynamic equation. Weyl presented a global transformation on metrics. In the present paper, we introduce Weyl-Euler-Lagrange equations on almost paracontact metric manifolds. Also, at the end of the study differential equations the obtained had been solved by Maple computation program.

Keywords: Paracontact Manifold, Mechanical System, Dynamic Equation, Lagrangian Formalism.

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Generalized Berinde-Type Contractions in Partially Ordered G_p-Metric Spaces

Meltem Kaya and Hasan Furkan
Department of Mathematics, Kahramanmaras Sutcu Imam University, Kahramanmaras, Turkey
meltemkaya55@hotmail.com, hasanfurkan@hotmail.com

Abstract: In this manuscript, we view generalized Berinde-type contractions, which is known as generalized almost contractions in the literature, in the framework of partially ordered G_p-metric spaces to get some common fixed point results for self-mappings f and g and some fixed point results for a single mapping f. Presented theorems generalize several previously obtained classical results. We also state some examples which show the validity of our results.

Keywords: Common Fixed Point, Partially Ordered Set, G_p-Metric Space, Weakly Increasing Maps, (c)-Comparison Function.

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On the Uniform Convergence of Spectral Expansions for a Spectral Problem Rationally Dependent on the Eigenparameter

Nazim B. Kerimov, Sertac Goktas and Emir A. Maris
Department of Mathematics, Mersin University, 33343 Mersin,Turkey
nazimkerimov@yahoo.com, srtcgoktas@gmail.com, e.ali.maris@gmail.com

Abstract: Consider the spectral problem

$$-y'' + q(x)y = \lambda y,\ 0 < x < 1,$$

$$y(0)\cos\beta = y'(0)\sin\beta,\ 0 \le \beta < \pi;\ \frac{y'(1)}{y(1)} = h(\lambda),$$

where λ is a spectral parameter, $q(x)$ is real-valued continuous function on [0,1],

$$h(\lambda) = a\lambda + b - \sum_{k=1}^{N} \frac{b_k}{\lambda - c_k},$$

where all the coefficients are real and $a \ge 0, b_k > 0, c_1 < c_2 < ... < c_N, N \ge 0$.

We investigate the uniform convergence of the spectral expansions of the continuous functions in the system of eigenfunctions of above spectral problem rationally dependent on the spectral parameter. To this end, we first obtain the sharpened asymptotic formulae for eigenvalues and eigenfunctions.

Note the papers [1]-[3] to which the present work is related.

Keywords: Differential Operator, Eigenvalues, Uniform Convergence of Spectral Expansion

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Sink Mobility Under Extreme Conditions in Wireless Sensor Networks

M. Emre Keskin
Department of Industrial Engineering, Ataturk University,
Yakutiye, Erzurum, Turkey
m.emre.keskin@gmail.com

Abstract: The notion of sink mobility in Wireless Sensor Networks (WSN) is offered as a remedy for a well known phenomenon called differently in several sources such as `crowded center effect" (Popa et al. [1]), ``energy hole problem" (Li and Mohapatra[2], Wu et al. [3]), and ``sink neighborhood problem" (Basagni et al. [4]). Most of the mobile sink studies from the literature assume that the sink(s) has limitless energy and it instantaneously jumps from one point to another. Hence, sink travel times are usually taken as zero in the literature and the data collected during the sink travel times are also neglected. One of the rare studies that puts some limitations on the mobility of the sink is due to Keskin et al. [5] in which nonzero sink travel time for a single mobile sink is employed. Sink travel time is considered as a part of the network lifetime and the data accumulated during the sink travel time is also taken into account. This study extends the notion of nonzero sink travel times for the WSNs with multiple mobile sinks and it indicates that considering nonzero sink travel times is important if the sink speeds are slower than 1 km per hour, i.e., for the network under extreme conditions.

Keywords: Wireless Sensor Networks, Sink Mobility, Mixed Integer Linear Programming.

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Car Insurance Customer Segmentation by Data Mining

Sadi Khadidja , Kherchi Hanya , Lounici Nadjib
Laboratory of Applied Statistics
ENSSEA,Pöle universitaire Koléa
Algiers- Algeria
sadikh00@gmail.com, kherchi.hanya@gmail.com

Abstract: This paper concerns the study of customer segmentation in car insurance. Car insurance is an obligatory insurance, which encourages competition on this market. Indeed, each company seeks to attract a maximum number of insured to increase its turnover.
Therefore, our main objective in this paper is to build a customer segmentation from five agencies of SALAMA (Algerian insurance company) with a data mining approach. For this, we have implemented a hybrid method that combines the K-means and multiple correspondence analysis (MCA). In addition, to identify the characteristics of each class discovered by the above-mentioned methods, we used the criterion of the V-test with Tanagra.
Keywords: Car Insurance – Segmentation-Datamining - k-Means – V-test.
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The Close Relationship Between Architecture and Mathematics

Murat Kilic
Deparment of Interior Architechure & Environment Design,
KırıkkaleUniversity, Kırıkkale, Turkey
muratkilic@kku.edu.tr

Abstract: The unity of architecture and mathematics goes back to the very ancient times. The reason is not only the fact that architecture substantially makes use of mathematics, but that they both are in search of order and aesthetics. Mathematics aims at reaching these in nature and architecture in structures. Mathematics is one of the most important design factors which significantly influences aesthetic results. It is a known fact that mathematics is indispensible in terms of understanding the calculations and ideas in structures. Mathematics has been used for centuries as an element of creating a visual order and harmony and as a tool of reaching aesthetical beauty. While doing this, geometry and ratios in mathematics have been made use of. Architect has frequently used proportional systems and geometry throughout history to create certain forms or to limit the created forms. The purpose behind using such a system is to achieve harmony between the elements of structures and to create a sense of unity in general in structures with "the principle which beautifies the beautiful." "It is the measurement and the morphology brought on by the measurement which will create beauty or keep it safe" [1]. In almost all inter-historical and inter-cultural construction traditions, there is a mathematical system which determines the relationship between the elements of the design. In fact, the rational system is made up of very basic elements: these consist of geometrical shapes which can be created with whole number ratios or simple equipments such as rulers and ropes [2].

Keywords: Architecture, Mathematics, Fibonacci

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An Inverse Result for the Periodic Boundary Conditions

Alp Arslan Kirac
Department of Mathematics, Pamukkale University,
Denizli, Turkey
aakirac@pau.edu.tr

Abstract: We obtain the classical Ambarzumyan's theorem for the Sturm-Liouville operatör L with real-valued potential $q \in L_1[0,1]$ and periodic boundary conditions when the subset of the spectrum of L and Fourier coefficients c_k of the potential q such that the condition

$$\sum_{|k|\geq n_0} |kc_k| < \infty$$

holds are given. The same result holds for the anti-periodic boundary conditions.

Keywords: Ambarzumyan Theorem, Inverse Spectral Theory, Hill Operator, Eigenvalue Asymptotics

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New Definitons About A^{I} - Statistical Convergence with Respect to a Sequence of Modulus Functions and Lacunary Sequences

Omer Kisi
Department of Mathematics, Faculty of Science and Literature
Bartın University, 74100, Bartın, Turkey
okisi@bartin.edu.tr
Hafize Gumus
Department of Mathematics, Faculty of Eregli Education,
Necmettin Erbakan UniversityEregli, Konya, Turkey
hgumus@konya.edu.tr
Ekrem Savas
Department of Mathematics, Istanbul Ticaret University,
Uskudar, Istanbul, Turkey
ekremsavas@yahoo.com

Abstract: In this study, we introduce the notion of A^{I}-lacunary statistical convergence, strongly A^{I}-lacunary convergence with respect to a sequence of modulus functions. We study some collections between them. Also, we give some inclusion relations between A^{I}-lacunary statistical convergence, A^{I}-statistical convergence with respect to a sequence of modulus functions.
Keywords: Lacunary Sequence, Ideal Convergence, Modulus Function.
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A Combinatorial Method for Characterizing the Linear Combinations of Finitely Many Diagonalizable Matrices That Mutually Commute

Emre Kisi, Halim Ozdemir
Department of Mathematics, Sakarya University, Sakarya TR54187, Turkey
ekisi@sakarya.edu.tr, hozdemir@sakarya.edu.tr

Abstract: This paper provides a combinatorial method, which depends on solving systems of linear equations where the coefficients of the unknowns of these linear equations are chosen from the spectrums of the matrices considered, for characterizing the linear combinations of finitely many diagonalizable matrices that mutually commute. Moreover, the problem, which is one of the open problems given in [Linear Algebra Appl. 437 (2012) 2091-2109], of characterizing all situations wherein a linear combination of the form $c_1X_1+c_2X_2+c_3X_3$ is a tripotent matrix when X_1 is an involutive matrix and both X_2 and X_3 are tripotent matrices that mutually commute is considered by means of this method. The results obtained cover those established in the reference above.

Keywords: Diagonalizable Matrices, Commutativity, Spectrum, Systems of Linear Equations, Linear Combination.

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A New Approach to Canal Surface with Parallel Transport Frame

Ilim Kisi, Gunay Ozturk
Department of Mathematics, Kocaeli University,
Kocaeli, Turkey
ilim.ayvaz@kocaeli.edu.tr, ogunay@kocaeli.edu.tr

Abstract: In the present study, we attend to the canal surfaces with the spine curve γ according to the parallel transport frame in Euclidean 4-space IE^4. We give an example of these surfaces and obtain some results about curvature conditions in IE^4. Moreover, we give the necessary and sufficient conditions for canal surfaces to become weak superconformal. Lastly, the visualizations of projections of canal surfaces are presented.
Keywords: Parallel Transport Frame, Normal Curvature, Curvature Ellipse.
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A Pseudo-Spectral Approach to the Multi-Pantograph Equation Systems

Ayse Betul Koc
Department of Mathematics, Selcuk University,
Konya, Turkey
aysebetulkoc@selcuk.edu.tr

Abstract: The pseudo-spectral methods have been gained much attention in the last years to achieved good results for the problems [1-5]. In this presentation, we shall introduce a new solution procedure based on the pseudo-spectral approach for the multi-pantograph equation systems. The soltions of the problems are sought in the form of a linear expansion of so called trial basis functions. The efficiency and validity of the proposed scheme is tested on some numerical examples.

Keywords: Pseudo-Spectral Approach, Operational Matrices, Pantograph Equation System.

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Some Remarks Related to Orthogonality in the Space of p-Summable Sequences

[1] *Sukran Konca and* [2] *Mehmet Aslan*
[1, 2] *Department of Mathematics, Bitlis Eren University, 13000, Bitlis, Turkey*
skonca@beu.edu.tr; m.aslan027@hotmail.com

Abstract: In this paper, we aim to give some remarks on the space of p-summable sequences l^p and to formulate new definitions of orthogonality in it as a 2-normed and n-normed space.

Keywords: Orthogonality, 2-Normed Space, *n*-Normed Space, 2-Inner Product, *n*-Inner Product.

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Double Weighted Lacunary Almost Statistical Convergence of Order α

Sukran Konca [1] , *Selman Ekin* [1] , *Ekrem Savas* [2]

[1] *Department of Mathematics, Bitlis Eren University,Bitlis,Turkey*

[2] *Department of Mathematics, Istanbul Commerce University, Istanbul, Turkey*

skonca@beu.edu.tr, selmanekin@hotmail.com, ekremsavas@yahoo.com

Abstract: In this work, we define and study double weighted lacunary almost statistical convergence of order α. Further, some inclusion relations have been examined.

Keywords: Weighted Lacunary Statistical Convergence, Double Statistical Convergence of Order α, Almost Statistical Convergence of Double Sequences, Sequence Space, Double Sequence.

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On Some Congruences

Sibel Koparal and Nese Omur
Department of Mathematics, Kocaeli University,
Kocaeli, Turkey
sibel.koparal@kocaeli.edu.tr & neseomur@kocaeli.edu.tr

Abstract: In this study, we investigate some congruences involving the numbers $B_{p,k-d}$ and harmonic numbers H_n, where $B_{p,k-d} = \frac{k-d}{p}\binom{2p}{p-k+d}$ and $H_n = \sum_{k=1}^{n} \frac{1}{k}$.

Keywords: Congruences, Harmonic Numbers and Binomial Coefficients.

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On Solutions to the Sylvester s-Conjugate Equations $A\left({}^{s}\overline{X}\right)-XB=C,\ s=1,2,3$ Over Elliptic Quaternion Matrices

Hidayet Huda Kosal and Murat Tosun
Department of Mathematics, Sakarya University,
Sakarya, Turkey
hhkosal@sakarya.edu.tr, tosun@sakarya.edu.tr

Abstract: In this study, the existence of solution to the elliptic quaternion matrix equations $A\left({}^{1}\overline{X}\right)-XB=C,\ A\left({}^{2}\overline{X}\right)-XB=C$ and $A\left({}^{3}\overline{X}\right)-XB=C$ is characterized and solutions of these matrix equations are derived by means of real representations of elliptic quaternion matrices.

Keywords: Elliptic Quaternion, Real Representation of Elliptic Quaternion Matrix.

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Scale Laws of Prime Number Distributions by the Modified Chi-Square Function

Daniele Lattanzi
former ENEA-FUS, Frascati Research Centre, Roma, Italy
Private address via La Spezia 81 – 00182 Roma, Italy
lattanzio.lattanzi@alice.it

Abstract: The statistical distribution of prime numbers represents an open problem in number theory still nowadays. The methodology of experimental mathematics [1] has not yet been attempted in this field, thus the present paper treats prime numbers as raw experimental data, with zero imprecision and zero inaccuracy, and as elements of larger and larger finite sequences $\{P_m\}$. The modified chi-square function $X^2_k(A,x/\mu)$ with the ad-hoc A, k and $\mu=\mu(k)$ parameters is the best-fit function of the differential distribution functions of both prime finite sequences $\{P_m\}$ and progressions $\{n^\alpha\}$ with $\alpha\in(1, 2)$ so that an injective map can be set between the former and the latter through the parameter k of their common fit function $X^2_k(A,x/\mu)$ showing that the property of scale invariance does not hold for prime distributions [2]. The histograms of prime gaps, best fitted by standard statistical distribution functions, show unexpected clustering effects and thus do the histograms of prime numbers themselves [3].

Keywords: Prime Distribution, Modified Chi-Square Function, Prime Gaps, Numeric Progressions.

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Some Properties of k −Quasi Class Q Operators

Shqipe Lohaj, Valdete Rexhëbeqaj Hamiti
Faculty of Electrical and Computer Engineering, University of Prishtina "Hasan Prishtina", Prishtinë, 10000, Kosova
shqipe.lohaj@uni-pr.edu, valdete_r@hotmail.com

Abstract: In this paper, we give some properties of k −quasi class Q. We proved that if T is an invertible operator and N is an operator such that N commutes with T^*T, then N is k −quasi-class Q if and only if TNT^{-1} is of k −quasi class Q operator. Morever, $\tilde{T}$ is k-quasi-class Q if and only if $\tilde{T}^{(*)}$ is k-quasi class Q, where the $\tilde{T}$ is Aluthge transformation and $\tilde{T}^{(*)}$ is $*-$ Aluthge transformation. We shown that if k −quasi class Q operator T commutes with an isometric operator S, then TS is k −quasi class Q.

Keywords: k −Quasi Class Q, Aluthge Transformation.

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Hele-Shaw Flow with a Time-Dependent Gap: The Schwarz Function Approach to the Interior Problem

K. Malaikah, T.V. Savina, and A.A. Nepomnyashchy
Department of Mathematics, Taibah University, Madina, Sauid Arabia
Department of Mathematics, Ohio University, Athens, OH 45701, USA
Department of Mathematics, Technion-Israel Institute of Technology, Haifa, 32000, Israel
Km306206@ohio.edu

Abstract: A Hele-Shaw problem with a time-dependent width of the gap is considered. A governing equation in terms of the Schwarz function of the free boundary for a class of generalized Hele-Shaw flows, which includes the problem with a time-dependent gap as a special case, is derived. The exact solution is obtained for the droplet with initial elliptical shape when the surface tension is neglected, and the asymptotic solution is obtained when the surface tension is taken into account.

Keywords: Hele-Shaw Flow, Schwarz Function.

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Numerical Study of Heat Transfer and Entropy Generation in a Nanofluid Filled Two-Sided Lid-Driven Cavity

Sumit Malik, A.K.Nayak
Department of Mathematics, Indian Institute of Technology Roorkee
Roorkee, Uttarakhand, India
ssumitmalik@gmail.com

Abstract: In this work, mixed convection flow and heat transfer inside a two sided lid-driven square enclosure filled with Cu-water nanofluid have been investigated numerically. The bottom and top walls are kept fixed while the left and right lids are moving in upward and downward directions. Two heat sources are placed equidistantly on the left and right part of the bottom wall maintaining a fixed distance from the mid section of bottom wall and side walls. A comparative study has been done based on the direction of moving walls. In Case-I , left lid is moving downwards and the right one is moving upwards and in Case-II, both the lids are moving in upward direction. The effect of various flow governing parameters such as Reynolds number, Richardson number and nanoparticle volume fraction are discussed. The thermodynamic optimization of the system is discussed by using entropy generation and Bejan number.

Keywords: Mixed Convection, Nanofluid, Entropy Generation, Bejan Number.

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Modeling of Tomatoes Solar Drying Systm in Arid Areas in Algeria

Saadeddine Manaa[*1,4], *A. Beatriz* [2], *D. Karlo*[3] *And N. Moummi* [4]
[1] *Hydrocarbon and Renewable Energy Department, Science and Technology Faculty, Ahmed Draia University - Adrar -Algeria.*
manaasaadeddine@gmail.com
[2] *National Food Institute, Technical University of Denmark, Kgs. Lyngby, Copenhagen, Denmark.*
emilie.beatriz@dtu.dk
[3] *The Laboratory of Solar Energetic and Building Physics (LESBAT), High School of Engineering and Management, Western Switzerland, Switzerland.*
(E-mail : daniel.karlo@heig-vd.ch)
[4] *Mechanical Engineering Department, University of Biskra , Biskra-Algeria.*
dgm@univ-biskra.dz

Abstract: Good knowledge of the phenomenon of solar drying, can give us a great performance solar drying of food products more profitable, why knowledge starts with a good theoretical knowledge which will be followed by mathematical modeling and simulation and at the end will be confirmed by experimental applications.
Drying the solid product based on the balance between the water contained in the product and water in gaseous form in air. This equilibrium can be promoted in a direction or the other according to the water content of the air and product.
Our study is a theoretical contribution of the energy balance of a convective drying system of agro-food products in southern Algeria. In our work we focus on the energy aspects of a solar drying system. The aim of our work is to study the influence of various parameters at play in drying tomato by use of an indirect solar dryer.
Keywords: Solar Drying, Drying of Tomato, Modeling, Simulation.

An Optimal Control Problem with Control in Coefficients

Gabriela Marinoschi
Institute of Mathematical Statistics and Applied Mathematics of the Romanian Academy, Bucharest, Romania
gabriela.marinoschi@acad.ro

Abstract: We study the existence, uniqueness and approximation for the solution to an optimal control problem governed by a parabolic equation with control in the drift term. There is a large variety of physical problems which can be formulated in this setting, especially those referring to transport and diffusion processes. Examples arise from hydrology (pollutant propagation), image restoring ([1]) or movement of biological populations. The optimal control is represented by the velocity field in the transport term of the equation and its identification is done on the basis of some available observations upon the solution at certain times. Due to the singular aspects of the control problem, the optimality conditions are found by handling the Leray projector and by passing to a limit technique in an appropriate regularizing optimal control problem. Numerical simulations based on the control construction algorithm are provided.
Keywords: Nonlinear Optimal Control, Inverse Problems, Parabolic Diffusion Partial Differential Equations, *m*-Accretive Operators, Leray Projector.
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Asymptotic Representations for Heavy-Tailed Distributions Under Random Censoring

Djamel Meraghni
Abdelhakim Necir Mohamed khider University, Biskra, Algeria
djmeraghni@yahoo.com

Abstract: In the analysis of lifetime, reliability or insurance data, the observations are not always available: they are usually randomly censored. We model this situation by introducing a non-negative random variable (rv), called censoring rv, independent of the rv of interest. Then, we consider the minimum of the two rv's and an indicator rv which determines whether or not there has been censorship. In this work, we make use of the empirical process theory to provide Gaussian approximations to some useful statistics in the analysis of extremes under random censoring. As a consequence, we expand the estimator of the shape parameter of censored heavy-tailed data in terms of Gaussian processes leading to its asymptotic normality only under the second-order condition of regular variation very well-known in extreme value theory.

Behavior of Cellular Beams with Various Opening Shapes

Mostefa Mimoune, Saad Siouane and Fatima Z. Mimoune
Civil engineering Department,
Constantine1 University, Algeria.
mmimoune@gmail.com

Abstract: This paper develops a finite-element model using ANSYS for the buckling analysis of perforated beams and uses it to investigate the effects of slenderness on the moment-gradient factor of simply supported perforated web beams. Web post buckling is studied by using numerical model. An investigation on steel beams with various shapes and sizes is reported based on web post buckling. A parameter study was conducted based on web post width and the effect of various openings is described.

Key Words: Buckling Mode, Cellular Beams, Finite Element Modeling, Steel Structures.

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Magnetic Fields of Asymmetric Magnetic Recording Heads Using the Superposition of the Head Filed

Ammar Edress Mohamed,
Exeter University
aie202@exeter.ac.uk

Abstract: Current magnetic recording heads, used in shingled magnetic recording and two-dimensional magnetic recording, often exhibit asymmetry in their structure. They consist of two semi-infinite poles separated by a gap (where the recording field is produced), with an inner gap faces inclined at an angle. Modelling of the fields from asymmetrical structures is complex, and no explicit solutions are currently available (only implicit conformal mapping solutions are available for rational inclination angles). An approximate solution for the fields from asymmetrical heads is derived in this paper. The derivation is based on the superposition of the surface fields from corner structures. The approximate expressions for the fields are compared to finite-element calculations revealing excellent agreement for inclination angles $\leq 140^{o}$.

On Fractional Differential Inclusions in Banach Space

Fatima Zohra Mostefai
Department of Mathematics, Dr. Moulay Tahar University,
Saida, Algeria
fatymath@gmail.com

Abstract: We consider a class of boundary value problem in separable Banach space governed by fractional differential inclusion with boundary conditions,

$$D^{\alpha}u(t) \in F\big(t, u(t), D^{\alpha-1}u(t)\big), \quad t \in [0,T]$$
$$u(0) - u'(0) = 0, \qquad u(T) + u'(T) = 0,$$

where $1 < \alpha \leq 2$, D^{α} is the standard Caputo fractional derivative, and F is a convex compact valued multifunction. Compactness property of the solutions set is presented.

Keywords: Boundary Value Problem, Fractional Derivative.

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Some Inequalities for the Multiplicative Zagreb Indices of Graph Operations

Yasar Nacaroglu and A.Dilek Maden
Department of Mathematics, Selcuk University,
Konya, Turkey
yasarnacar@hotmail.com
aysedilekmaden@selcuk.edu.tr

Abstract: Molecular descriptors have found a wide application in QSPR/QSAR studies [1]. Among them, topological indices have a prominent place. The Zagreb indices are among the oldest degree-based topological invariants, were introduces by Gutman et al [2]. The multiplicative Zagreb indices were introduced by Todeschini et al. in 2010 [3]. In this paper, we give some upper bounds for the multiplicative zagreb indices of various graph operations such as union, join, rooted product, corona product, tensor product, etc.

Keywords: Degree, Upper Bounds, Multiplicative Zagreb Indices, Graph Operations.

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Statistics of the Extreme Values Under Random Truncation

Abdelhakim Necir
Laboratory of Applied Mathematics, Mohamed Khider University,
Biskra, Algeria
necirabdelhakim@yahoo.fr

Abstract: A weighted Gaussian approximation to tail product-limit process for Pareto-like distributions of randomly right-truncated data is provided and a new consistent and asymptotically normal estimator of the extreme value index is introduced. A simulation study is carried out to evaluate the finite sample behavior of the proposed estimator and compare it to that recently proposed by Gardes and Stupfler [2]. Also, a new approach of estimating extreme quantiles, under random right truncation, is derived and applied to a real dataset of lifetimes of automobile brake pads. All the given results are recently published in [1].

Keywords: Empirical Process, Extreme Value Index, Heavy-Tails; High Quantiles, Hill Estimator; Lynden-Bell Estimator, Random Truncation..

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Vaccination for Preventing Future Rubella Epidemic in Japan

Hiroshi Nishiura, Ryo Kinoshita
Graduate School of Medicine, Hokkaido University
Sapporo, Japan
nishiurah@gmail.com

Abstract: A large epidemic of rubella occurred from 2012-14 in Japan, which has been attributed to insufficient herd immunity level and previous vaccination policy shifting from junior high school female students to both gender at the age of 12-24 months and 5-7 years. The present study aimed to identify best vaccination strategy that could minimally help us achieve herd immunity by targeting specific age group and gender. The so-called next generation matrix was computed from the growth phase of rubella epidemic in 2013. It appears that the optimal target host depends on available vaccination stock, but targeting adult male appears to be more efficient than targeting female or both gender. Vaccinating adults at workplace is likely an efficient prevention strategy.

Keywords: Epidemiological Model, Rubella, Vaccination, Optimization, Age, Japan

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Application of Data Mining to Insurance Multi-Risk Habitation and Professional Branch

Lounici Nora, Sadi Khadidja, Djemaa Hassiba
Laboratory of Applied Statistics
ENSSEA,Pöle universitaire Koléa, Algiers- Algeria
noralounici@yahoo.fr, sadikh00@gmail.com, djemaa_hassiba@yahoo.fr

Abstract: Data Mining is the set of techniques and methods used in a process for the extraction of knowledge from data which is applied in several areas, among others, the insurance sector. There are a variety of insurance products. In our study, we are interested in on insurance (fire, Accidents and various risk), such as multi-risk habitation and professionals to reduce their severities.
The purpose of this paper is the extraction of the characteristics of multi-risk habitation and professional products, and on the other hand the study of the factors that make the peculiarity of each product, according to a approach of Data Mining. To do this, we started by treatment and analyzing data. Secondly, we proposed a general approach based on a number of techniques for the selection of the most informative variables. In this context and in order to solve our problem, we opted for the following methods: *binary logistic regression*, *the STEPDISC* procedure and *the v- test* of Tanagra.
Keywords: Data Mining – Multi-Risk Insurance – Binary Logistic Regression – Stepdisc – Test of Value.
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Exact Solutions of Some Nonlinear Evolution Equations

Meryem Odabasi, Emine Misirli
Tire Kutsan Vocational School, Ege University,
Tire, Izmir, Turkey
meryemodabasi@gmail.com,
Department of Mathematics, Ege University,
Bornova, Izmir, Turkey
emine.misirli@ege.edu.tr

Abstract: In this study, exact solutions of the nonlinear partial differential equations have been examined. The Tzitzeica-Dodd-Bullough [1], the nonlinear telegraph [2] and the generalized Benjamin-Bona-Mahony [3] equations are studied by means of the complete discrimination system and the modified trial equation method [4]. These equations have various applications in communication theory, nonlinear optics, solid state physics, quantum field theory and fluid dynamics, hence obtaining exact traveling wave solutions of the equations can be useful to understand the phenomena they describe.

Keywords: Tzitzeica-Dodd-Bullough Equation, Nonlinear Telegraph Equation, Generalized Benjamin-Bona-Mahony Equation.

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Existence of Solutions for Dynamic Systems on an Infinite Time Scale

Arzu Denk Oguz and S. Gulsan Topal
Department of Mathematics, Ege University,
Bornova, Izmir, Turkey
arzu.denk@hotmail.com; f.serap.topal@ege.edu.tr

Abstract: In this study, we consider the systems of second order multipoint boundary value problems on infinite time scales. Using the monotone method, we give the existence result for these systems.

Keywords: Infinite Interval, Lower And Upper Solutions, Time Scales.

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An Extension of a Valuation v on a Field K with $rankv = 2$ to $K(x)$

Figen Oke
Department of Mathematics,Faculty of Science Trakya University,Edirne,Turkey
figenoke@gmail.com.

Abstract: Let v be a valuation on a field K, G_v be the value of v and k_v be the residue field of v and w be an extension of v to $K(x)$. w is called a residual algebraic free extension of v if k_w / k_v is an algebraic extension and G_w / G_v is not torsion group. In this study it is assumed that $v = v_1 \circ v_2$ is a valuation on a field K with $rankv = 2$. In this case there exist three kind residual algebraic free extensions of v to $K(x)$. Here the one of these extensions is described and its properties are investigated.

Keywords: Extensions of Valuations, Residual Algebraic Free Extensions, Rank of Valuation.

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On Tauberian Conditions for the $(\overline{N}, p)$ Summability of Integrals

Muhammet Ali Okur, Ibrahim Canak** and Umit Totur**
**Department of Mathematics, Adnan Menderes University,*
Aydın, Turkey
***Department of Mathematics, Ege University,*
İzmir, Turkey
mali.okur2@gmail.com

Abstract: In this paper, we obtain some new Tauberian theorems for the weighted mean method of integrals by using the weighted general control modulo. Our results in this work are generalizations of some classical type Tauberian theorems.I

Keywords: Tauberian Theorem, Tauberian Condition, Weighted General Control Modulo, ($\overline{N}, p$) Summability of Integrals.

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Eigenvalues and Spectral Singularities of Non-Selfadjoint Matrix Sturm-Liouville Operators with Eigenvalue-Dependent Boundary Conditions

Murat Olgun
Department of Mathematics, Faculty of Science,
Ankara University, Ankara, Turkey
olgun@ankara.edu.tr

Abstract: In this talk we investigate discrete spectrum of the non-selfadjoint matrix Sturm-Liouville operator L generated in $L^2(\mathbb{R}_+;S)$ by the differential expression

$$\ell(y) = y'' + Q(x)y, \quad x \in \mathbb{R}_+ := [0,\infty)$$

and the boundary condition

$$y'(0) - (\beta_0 + \beta_1\lambda + \beta_2\lambda^2)y(0) = 0$$

where Q is a non-selfadjoint matrix valued function. Also using the uniqueness theorem of analytic functions we prove that L has a finite number of eigenvalues and spectral singularities with finite multiplicities.

Keywords: Eigenvalues, Spectral Singularities, Spectral Analysis, Sturm-Liouville Operator, Non-Selfadjoint Matrix Operator.

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A New Type of Convergence for a Sequence of Rays

Oznur Olmez and Salih Aytar
Department of Mathematics,Suleyman Demirel University,
Isparta, Turkey
oznur_olmez@hotmail.com , salihaytar@sdu.edu.tr

Abstract: In this work, we introduce the concept of rough convergence of a sequence of rays. We give an alternative definition of the rough convergence for a sequence of rays. We also investigate the relations between the rough limit sets of a sequence of rays and its subsequence. Later, we prove the monotonicity of the rough limit set of a sequence of rays. We say that the rough limit set of such a sequence does not convex. In addition, we prove that if $(x^{\nu}) \xrightarrow{r} (x)$ and $(y^{\nu}) \xrightarrow{r} (y)$, then we have $(x^{\nu} + y^{\nu}) \xrightarrow{2r} (x + y)$.

Keywords: Rough Convergence, Sequence of Rays, Rough Limit Set.

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Some Commutativity Theorems for Rings with Involution

Lahcen Oukhtite
Department of Mathematics, Faculty of Science and Technology, University Moulay Ismaïl, Errachidia, Morocco
oukhtitel@hotmail.com

Abstract: The purpose of this work is to study commutativity of certain rings with involution equipped with derivations (generalized derivations) satisfying particular identities. Some well-known results characterizing commutativity of prime rings have been generalized. Moreover, examples proving the necessity of our hypotheses are given.

Keywords: Commutativity, Derivations, Prime Rings, Involution.

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A Nonstandard Numerical Scheme for a Predator-Prey Model with Allee Effect

Nihal Ozdogan
Isparta Vocational School,Suleyman Demirel University,
Isparta, Turkey
Mevlude Yakit Ongun
Department of Mathematics, Suleyman Demirel University,
Isparta, Turkey
mevludeyakit@sdu.edu.tr

Abstract: Predator-prey dynamics play an important role in mathematical biology. In this talk, we present a Lotka-Volterra predator-prey model with Allee effect. In this system with general functional response has an Allee effect on Prey population. $\alpha(x) := \frac{x}{\beta+x}$, $\beta > 0$ term is called "Allee effect constant".

A nonstandard finite difference scheme is constructed to simulate for the model. We use the Jury test which deal with coefficients of the characteristic polynomial for determining the stability of discrete time system.

Keywords: Allee Effect, Stability Analysis, Nonstandard Numerical Scheme, Schur-Cohn Criteria.

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On the Stability of a Neural Field Model

Berrak Ozgur and Ali Demir
Department of Mathematics Kocaeli University,
Izmit, Kocaeli, Turkey
berrak.ozgur@kocaeli.edu.tr
ademir@kocaeli.edu.tr

Abstract: In this work, we present some conditions for the stability of a neural field model and the asymptotic stability region is determined in the parameter space. Moreover we determine the number of unstable characteristic roots in the regions where the asymptotic stability fails.

Keywords: Neural Field Model, Stability Analysis.

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Value Groups and Residue Fields Writing via Distinguished Chains

Burcu Ozturk, Figen Oke
Department of Mathematics, Trakya University,
Edirne, Turkey
burcuozturk@trakya.edu.tr, figenoke@gmail.com

Abstract: Let v be a valuation of a field K and $\bar{v}$ be the fixed extension of v to the algebraic clousure $\overline{K}$ of K. Let v_a be the restriction of $\bar{v}$ to the field $K(a)$ where $a \in \overline{K}\backslash K$. In this study a distinguished chain of an element $a \in \overline{K}\backslash K$ is considered and the value group and residue field of the valuation v_a is written by using the δ_K constants and minimal polynomials of the elements in the chain. Also the value groups and residue fields of the valuations $v_{a_i b_i}$ of the fields $K(a_i, b_i)$ is compared where $a = a_0, a_1, \dots, a_n$ is a distinguished chain of $a \in \overline{K}\backslash K$ and $b = b_0, b_1, \dots, b_n$ is a distinguished chain of $b \in \overline{K}\backslash K$.

Keywords: Valuations, Distinguished Chain, Algebraic Extension.

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Fixed Point Results for General Type Contractions in Modular Spaces

Mahpeyker Ozturk
Department of Mathematics, Sakarya University,
Sakarya, Turkey
mahpeykero@sakarya.edu.tr

Abstract: In the context of modular space, by using the existing findings we introduce some general type contractions and investigate the existence of fixed points and coincidence points for the mappings satisfying such contractions.
Keywords: Modular space, Coincidence Point, Common Fixed Point.
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Common Best Proximity Points of Generalized Almost (α,β)-(ψ,ϕ)-Geraghty Contractive Mappings in Metric Spaces

Mahpeyker Ozturk, Neslihan Kaplan
Department of Mathematics, Sakarya University,
Sakarya , Turkey
neslihankaplan.nk@gmail.com, mahpeykero@sakarya.edu.tr

Abstract: The main purpose of this study is to introduce the notions of cyclic (α,β)- proximal admissible pair and almost generalized (α,β)-(ψ,ϕ)-Geraghty contractive nonself mappings in metric spaces. Also, we demonstrate the existence and uniqueness of common best proximity point of such contractions in the context of metric space. Some concrete example is furnished which shows validity of our results.

Keywords: Common Best Proximity Point, Metric Space, Generalized Almost (α,β)-(ψ,ϕ)-Geraghty Contractions.

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Relations Between Darboux and Bishop Frames on a Regular Curve in Minkowski Space

Emin Ozyılmaz, Amine Yılmaz
Faculty of Science, Department of Mathematics, Ege University,
Bornova, İzmir, Turkey
emin.ozyilmaz@ege.edu.tr, amineyilmaz2020@hotmail.com

Abstract: In this work, we give relationships between Darboux and Type-2 Bishop frames in Minkowski space. We find the geodesic curvature ,normal curvature and geodesic torsion according to Type-2 Bishop curvatures of a spacelike unit speed curve on a timelike surface. Also,we give transition matrix between the Darboux and Type-2 Bishop frames. Moreover, we give some relations between Darboux and Type-2 Bishop frames of the spherical images of the apparatus of type-2 Bishop frames. Finally, we obtain some interesting relations and illustrates of the examples by the aid of Maple programe.

Keywords: Bishop Frame, Darboux Frame, Regular Curve, Minkowski Space.

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Results on Hadamard Codes and Codes Over Rings

Mustafa Ozkan and Figen Oke
Department of Mathematics,Faculty of Science Trakya University,Edirne,Turkey
mustafaozkan@trakya.edu.tr
figenoke@gmail.com.

Abstract: In this paper, the results obtained by authors M. Özkan, F. Öke [1] are extended for codes over the ring $F_2+uF_2+u^2F_2$ where $u^3=0$. Using special matrices over $F_2+uF_2+u^2F_2$ where $u^3=0$, $C^{\alpha,\beta}$ codes are defined. It is shown that Gray images of the codes $C^{\alpha,\beta}$ are Hadamard codes over binary field. In addition to these codes, new codes are defined over the ring $F_2+uF_2+u^2F_2$. Moreover, a relation between new codes and Hadamard codes is established.

Keywords: Codes Over Rings, Hadamard Codes, Linear Codes.

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Perturbation-Iteration Method for Singular Problems

Mehmet Pakdemirli
Applied Mathematics and Computation Center, Celal Bayar University,
Muradiye, Yunusemre, Manisa, Turkey
mpak@cbu.edu.tr

Abstract: Perturbation-iteration method of solving differential equations is first proposed by Pakdemirli *et al.* [1] for the first order ordinary differential equations. The method is called as "the perturbation iteration method" to distinguish it from the past literature on the so-called "iteration-perturbation methods" [2-5] which are not systematic approaches and does not produce general algorithms valid for various types of differential equations. The new perturbation-iteration method is directly applicable in a systematic algorithmic way, does not require special transformations or *ad hoc* assumptions. Second order differential equations were treated by the same method by Aksoy and Pakdemirli [6] for Bratu type equations. Aksoy *et al.* [7] further solved some nonlinear heat transfer equations. Dolapci *et al.* [8] applied the method to the Fredholm and Volterra integral equations. Şenol *et al.* [9] treated the first order differential equation systems using the method. Pakdemirli [10] reviewed the mentioned work. In a very recent work, Pakdemirli [11] successfully applied the method to problems with secularities also. Non-singular perturbation problems were investigated in all of the previous mentioned work. In this study, the perturbation-iteration method is applied to singular perturbation problems (Boundary layer type equations). The approximate solutions are contrasted with the available exact or numerical solutions. It is found that the new method produces compatible solutions with the exact or numerical solutions.

Keywords: Perturbation-Iteration Method, Singular Perturbation Problems, Numerical Computations.

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Transportation Situations and Related Games with Interval Uncertainty

Osman Palanci, Sirma Zeynep Alparslan Gok**, Hamid Alzaki, Sule Nizamoglu*
**Department of Mathematics, Suleyman Demirel University, Isparta, Turkey*
osmanpalanci@sdu.edu.tr
***Department of Mathematics, Suleyman Demirel University, Isparta, Turkey*
sirmagok@sdu.edu.tr

Abstract: Cooperative interval games have broad applicability in Operations Research (OR) such as sequencing, minimum cost spanning tree situations, in economy and also on modern finance. On the other hand, uncertainty is present in almost every real-world situation, it is influencing and questioning our decisions. In this study, we analyze an OR game arising from an OR situation under uncertainty namely transportation interval games. Hence, we use the theory of cooperative interval games. Firstly, we introduce the interval Shapley value of the game. Then, we obtain a one-point solution using the one-stage producere depending on the proportional rule (PROP), the constrained equal awards rule (CEA) and the constrained equal losses (CEL) rule. On the other hand, the nonemptiness of the interval core for the transportation interval games, and some results on the relationship between the interval core and the dual interval optimal solutions of the underlying transportation situations are provided.

Keywords: Operations Research, Transportation Situations, Cooperative Interval Games, The Proportional Rule, The Constrained Equal Awards Rule, The Constrained Equal Losses Rule.

Solutions of Some Diophantine Equations

Bilge Peker
Department of Mathematics Education, Necmettin Erbakan University,
Meram, Konya, Turkey
bilge.peker@yahoo.com

Abstract: One of the most complicated equations are Diophantine equations and solutions of such equations attract many mathematicians. In this study, our aim is to obtain the general solutions of some Diophantine equations in terms of some special sequences.

Keywords: Diophantine Equations, Pell Equations, Integer Sequences.

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Numerical Solution for a Free Convection Flow

Haldun Alpaslan Peker
Department of Mathematics, Selcuk University,
Campus, Konya, Turkey
pekera@gmail.com

Abstract: Heat transfer is an important process in engineering applications and physics and for this reason, advances in heat transfer improve the efficiency of many processes. The aim of this study is to present a semi-analytic solution of a free convection flow.

Keywords: Analytic Solution, Convection, Heat Transfer.

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A Method for Decision Making Problems by Using Graph Representation of Soft Set Relations

Nazan Cakmak Polat, Bekir Tanay
Department of Mathematics, Muğla Sıtkı Koçman University,
Muğla, Turkey
ncakmak@mu.edu.tr

Abstract: Soft set theory defined by Molodtsov in [8], has a rich potential for applications in several directions in life. One of successful application of soft set theory is about constructing new methods which are effective for Decision Making problems. In this study we introduced a method by using graph representation of soft set ralations, for solving Decision Making problems. Then we gave examples as an application of this method.

Keywords: Soft Set, Decision Making Problems, Soft Set Relations.

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The Best Quadratic Approximation of Hyperbola with Order Four

Abedallah Rababah
Department of Mathematics and Statistics,
Jordan University of Science and Technology,
22110 Irbid, Jordan
rababah@just.edu.jo

Abstract: The best parametric polynomial approximation of degree 2 to the hyperbola is given. This approximation has order 4. The associated error function vanishes 4 times and equioscillates 5 times. For an arc of the hyperbola of length 4.16708, the error is bounded by 0.06.. Details of the derivation are presented to show how to apply the method. The method is simple; this encourages and motivates people working in CG and CAD to apply it in their works.

Keywords: Bezier Curves, Uniform Approximation, Hyperbola, High Order of Approximation, Chebyshev Polynomials.

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Existence Results for Weak Solution of Multi-Term Fractional Differential Equations in Non-Reflexive Banach Spaces via Riemann Pettis Integral

Ghaus Ur Rahman
Department of Mathematics & Statistics, University of Swat, KPK, Pakistan
dr.ghaus@uswat.edu.pk

Abstract: Fractional differential equations have fascinated scientists by virtue of its various applications in many branches of sciences e.g. physics, chemistry, mathematical biology [1]. Usually we deal with those differential equations [2], which contain one differential operator; nevertheless, in certain situation we need to solve a phenomina while using multi-term fractional differential operator [3]. The present paper explorer sufficient conditions for the existence of weak solution of the multi-term fractional differential equations in non-reflexive Banach spaces. Here differential operators are weak fractional Caputo derivatives while the solution is weakly absolutely continuous function. Weak measure of non-compactness and O'Regan fixed point theorem is used to show existence results of the solution of differential equation.

Keywords: Weak Measure of Non-Compactness, Non-Reflexive Banach Spaces, Fractional Differenational Equations.

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An M/M/2 Retrial Queue with Breakdowns and Repairs

Lila Raiah and Nadia Oukid
Saad Dahlab University
Department of Mathematics
Blida, Algeria
raiah.lila@yahoo.fr; oukidnad@yahoo.fr

Abstract: Retrial queues have been widely used to model many problems arising in telephone switching systems, telecommunication networks, computer networks and computer systems, etc. It is of basic importance to study reliability of retrial queues with server breakdowns and repairs because of limited ability of repairs and heavy influence of the breakdowns on the performance measure of the system.

For a detailed review of the main results and the literature on this topic, the reader is referred to the monographs of Falin and Templeton [1], Artalejo and Gomez-Corral [2].

Multi-server retrial queueing systems, in general, are difficult to analyze from a mathematical standpoint see [3] and [4]. Exact results for the steady-state probabilities of reliable systems are given only for the single and two-server cases. In the unreliable model, there are no exact solutions when the number of servers exceeds one [5].

In this paper, we consider an unreliable M/M/2 retrial queueing system for which both servers are subject to active and idle breakdowns. Arriving customers who find both servers busy or failed are given the choice to abandon their service request or enter a retrial orbit. Should a failure occur while a customer is in service, the customer is given the option to depart the system or proceed to the retrial orbit. We also assume that preempted customers, once able to regain access to a server, repeat their service requests. We assume that each server has its own dedicated repair person, and repairs begin immediately following a failure. Inter-failure times, repair times and times between retrials are exponentially distributed, and all processes are assumed to be mutually independent.

Our main purpose is to derive approximate expressions for several congestion and delay measures. Next, we give approximate analysis for reliability of such a retrial queues. We obtain approximations of some main reliability indexes such as the availability, failure frequency and reliability function of the servers. Extensive numerical illustrations are provided.

Keywords: Reliability, Retrial Queues, Approximations, Breakdowns.

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Isothermic Hopf Cylinders and Slant Helices

Cagla Ramis and Yusuf Yayli
Department of Mathematics, Ankara University,
Tandogan, Istanbul, Turkey
cramis@ankara.edu.tr
yayli@science.ankara.edu.tr

Abstract: Hopf cylinder which is the inverse image of spherical curves in 2-sphere by means of the Hopf fibration $\pi: S^3 \to S^2$ is introduced by Pinkall [4]. Besides, the isothermic surface characterization for Hopf cylinders is obtained in terms of the geodesic curvature of the generator curve of Hopf cylinder in [2]. This paper aims that the search of the isothermic condition for Hopf cylinders determined by spherical slant helices with their new characterization endowed by Menninger [1]. Moreover, we give an efficient geometric interpretation of curves of constant precession introduced by Scofield [3] with the isothermic theory.

Keywords: Hopf Map, Hopf Cylinder, Isothermic Surface, Slant Helix, Curve of Constant Precession.

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On the M-Power Class (N)

M.H.M.Rashid
Dept. of Mathematics & Statistics
Faculty of Science P.O.Box(7)
Mu'tah University-Jordan
malik_okasha@yahoo.com

Abstract: A Hilbert space $T \in B(H)$ is said to M-power class (N) if there is a real number $M > 0$ such that $\left\|(T-\lambda)^n x\right\|^2 \le \left\|(T-\lambda)^{2n} x\right\| \|x\|$ for all $\lambda > 0$ and all $x \in H$. In this paper we prove the following assertions:
(i) T is M - power class (N) if and only if

$$M^2 (T-\lambda)^{*2n} (T-\lambda)^{2n} - 2r(T-\lambda)^{*n} (T-\lambda)^n + r^2 I \ge 0$$

for all $\lambda > 0$ and $r > 0$.
(ii) If T is invertible M-power class (N), then T^{-1} is also M-power class (N).
(iii) If T is partial isometry M-power class (N) satisfies $\|T-\lambda\| \le \frac{1}{M}$, then T is subnormal.
(iv) If T is M-power class (N), then it is an isoloid.

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Generalized Topological Vector Spaces

Salti Samarah
Department of Mathematics,
Jordan University of Science and Technology
Jordan
samarah@just.edu.jo

Abstract: Let X be a non-empty set and exp X the power set of X .We call a class $\mu \subseteq$ exp X a generalized topology [5] (briefly, GT) if $\phi \in \mu$ and the arbitrary union of elements of μ belongs to μ . A set X with a GT μ on it is called a generalized topological space (briefly, GTS) and is denoted by (X, μ) .

For a GTS (X, μ), the elements of μ are called μ -open sets and the complements of μ -open sets are called μ -closed sets

A space (X_μ, F_η) is said to be a generalized topological vector space over the filed F if the following two conditions are satisfied: 1. for each $x, y \in X$ and each μ -open neighbourhood W of $x+y$ in X , there exist μ -open neighbourhood U and V in X of x and y respectively, such that $U+V \subseteq W$.

2. for each $x \in X$, $\lambda \in \mathsf{F}$ and for each μ -open neighbourhood W of λx in X , there exist η -open neighbourhood U of λ in F and V of x in X such that $U \bullet V \subseteq W$.

In this paper, we introduce and study the new classes of generalized topological vector spaces are investigated and several new facts concerning generalized topological vector spaces are established.

Keywords: Generalized Topology, Topological Vector Space, (μ, λ) - Continuous, (μ, λ) - Homeomorphism.

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On $S_{\lambda}^{L}(I)^{\alpha}$ Asymptotically Statistical Equivalent of Functions

Rabia Savas, Mahpeyker Ozturk
Department of Mathematics, Sakarya University,
Sakarya, Turkey
rabiasavass@hotmail.com, mahpeykero@sakarya.edu.tr

Abstract: This paper uses x(t) and y(t) two nonnegative real-valued Lebesque measurable functions in the interval $(1,\infty)$ instead of sequences to introduce new definitions which are interrelated to notions asymptotically I_{λ}-statistical equivalent of order α to multiple L and strongly I_{λ}-asymptotically equivalent of order α to multiple L. In addition, we shall also present some of inclusion theorems.

Keywords: Ideal, Filter, I-Statistical Convergence, Real Valued Function, Asymptotical Equivalent.

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On Asymptotically I-Lacunary Statistical Equivalent Functions of Order α

Rahmet Savas
Department of Mathematics, Istanbul Medeniyet University,
Uskudar, Istanbul, Turkey
rahmet.savas@medeniyet.edu.tr

Abstract: In this paper we introduce new definitions which are interrelated to notions asymptotically I_θ-statistical equivalent of order α to multiple L and strongly I_θ-asymptotically equivalent of order α to multiple L by using *x(t)* and *y(t)* two nonnegative real-valued Lebesque measurable functions in the interval (1, ∞) instead of sequences to. Futhermore some of inclusion theorems are presented.

Keywords: Ideal, filter, I-statistical convergence, real valued function, asymptotical equivalent,

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A New Numerical Method Based on Hybrid Taylor and Lucas Polynomials for Solving a Class of Linear Volterra-Type Functional Integto-Differential Equations with Proportional and Variable Delays

[1]Nurcan Baykus Savasaneril and [2]Mehmet Sezer
[1]Izmir Vocational School, Dokuz Eylül University, Izmir, Turkey
[2]Celal Bayar University, Faculty of Science, Department of Mathematics, 45040, Manisa,
[1]nurcan.savasaneril@deu.edu.tr
[2]mehmet.sezer@cbu.edu.tr

Abstract: In this paper, a numerical matrix method is developed for numerically solving high-order linear Volterra-type functional integro- differential equations with mixed mixed proportional and variable delays under initial conditions. These type problems often appear in mathematical physics, mechanics, electronics, geophysics and other branches of natural sciences. The technique we have used is essentially based on Taylor and Lucas polynomials together with the standard or Chebyshev-Lobatto collocation points, and then the solution of problem is reduced to the solution of a system of algebraic equations. Also, to demonstrate the accuracy and efficiency of the method, an error analysis is performed based on residual functions.

Keywords: Volterra-Type Functional Equations, Integro Differential Equations, Matrix Method; Collocation Points, Taylor and Lucas Polynomials, Residual Functions.

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Existence Result for Nonlinear Fractional Differential Equations with Nonlocal Fractional Integro-Differential Boundary Conditions in Banach Spaces

Djamila Seba
Department of Mathematics, Boumerdes University,
Boumerds, Algeria
seba@univ-boumerdes.dz

Abstract: The topic of fractional differential equations has been of great interest for many researchers in view of its theoretical development and widespread applications in various fields of science and engineering such as physics, biophysics, chemistry, statistics, economics, blood flow, phenomena, control theory, porous media, electromagnetic, and other fields.
Boundary value problems with integral boundary conditions constitute an important class of problems and arise in the mathematical modeling of various phenomena such as heat conduction, wave propagation, gravitation, chemical engineering, underground water flow, thermoelasticity, and plasma physics. They include two-point, three-point, multipoint, and nonlocal boundary value problems.
In this paper, we consider the following boundary value problem of fractional differential equation with nonlocal fractional integro-Differential Boundary Conditions of the form

$$\begin{cases} {}^{c}D^{r}x(t) = f\big(x, x(t)\big), \;\; t \in [0,1], \;\; 1 < r \leq 2 \\ \alpha_1 x(0) + \beta_1 \;\; {}^{c}D^{q}x(0) = \gamma_1 \displaystyle\int_0^{\vartheta} \frac{(\vartheta - s)^{r-2}}{\Gamma(r-1)} x(s)ds, \quad 0 < q < 1 \\ \alpha_2 x(1) + \beta_2 \;\; {}^{c}D^{q}x(1) = \gamma_2 \displaystyle\int_0^{\sigma} \frac{(\sigma - s)^{r-2}}{\Gamma(r-1)} x(s)ds, \;\; 0 < \vartheta, \;\; \sigma < 1 \end{cases}$$

Our investigation relies upon the method associated with the technique of measures of noncompactness and the fixed point theorem of M\"onch type.
Keywords: Caputo Fractional Derivative, Riemann Liouville Integral, Measure of Noncompactness, Fixed Point, Banach Space.

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On Statistical Convergence of Order (α, β)

Hacer Sengul
Department of Mathematics, Siirt University,
Siirt, Turkey
hacer.sengul@hotmail.com

Abstract: The concept of statistical convergence was introduced by Fast[1] and later reintroduced by Schoenberg[2] independently. Later on, it was further investigated from the sequence space point of view and linked with summability theorem by Salát[3] and Fridy[4]. The order of statistical convergence of a sequence of numbers was given by Gadjiev and Orhan[5]. In this paper, we shall study statistical convergence of order (α, β) and strongly p-Cesaro summability of order (α, β) for sequences of complex (or real) numbers. Also, some inclusion relations between the statistical convergence of order (α, β) and strongly p-Cesaro summability of order (α, β) are given.

Keywords: Sequences, Statistical Convergence, Cesaro Summability.

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Reduced Differential Transform Method with Fixed Grid Size for Solving Klein Gordon Equations

Sema Servi[1], Yildiray Keskin[2], Galip Oturanc[2]
1.Vocational School of Technical Sciences, Selcuk University
2.Department of Mathematics, Science Faculty, Selcuk University, Selcuklu,, Konya, Turkey
semaservi@selcuk.edu.tr
goturanc@selcuk.edu.tr
ykeskin@selcuk.edu.tr

Abstract: In this study, a method was developed by applying a new algorithm to the reduced transformation method[4] that is an effective method for solving partial differentiable equasions in literature and RDTM with fixed grid size was formed.[1,3]The sampling of the method was made on the equation of Klein gordon in the application part[2]. Finally, efficiency of the method was indicated by comparing the results obtained through exact solution and varational iteration method.

Keywords: Reduced Differential Transform Method, Variational Iterationa Method, Klein Gordon Equations.

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Tauberian Conditions Under Which Ordinary Convergence Follows From Logarithmic Type Summability Methods

Sefa Anıl Sezer,**, Ibrahim Canak***
**Department of Mathematics, İstanbul Medeniyet University, İstanbul, Turkey*
***Department of Mathematics, Ege University, İzmir, Turkey*
sefaanil.sezer@medeniyet.edu.tr

Abstract: The notion of general control modulo of the oscillatory behavior of a real sequence (s_n) was first presented by Dik[1] for $(C,1)$ summability method. In this work, inspired by Dik[1] we introduce the general control modulo for logarithmic means, that leads new Tauberian conditions and consequently new Tauberian theorems for logarithmic power series method (L). Also we define generalized logarithmic power series method (L,m) and establish Tauberian conditions of the slowly decreasing type to obtain ordinary convergence of (s_n) from its (L,m) summability. The results of this study extend and improve some of the well-known Tauberian theorems in the literature.

Keywords: Tauberian Theorems, Logarithmic Means, General Control Modulo.

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BEM Solution of MHD Flow in a Semi-Infinite Channel with Variable Wall Conductivity

M. Tezer-Sezgin and Canan Bozkaya
Department of Mathematics, Middle East Technical University,
Ankara, Turkey
munt@metu.edu.tr

Abstract: In this study, we consider the magnetohydrodynamic (MHD) flow that is laminar and steady of a viscous, incompressible and electrically conducting fluid in a semi-infinte channel under an externally applied magnetic field. The flow is driven by the current produced by a pressure gradient. The external magnetic field is applied either perpendicular or parallel to the semi-infinte walls which have constant conductivities opposite in sign or perfectly conducting. The wall that connects the two semi-infinite walls has variable conductivity in terms of a mixed boundary condition. A boundary element method (BEM) solution is obtained using a fundamental solution that enables to treat the MHD equations in coupled form with general wall conductivities. The inhomogeneity of the equations due to pressure gradient is tackled obtaining a particular solution. Constant elements are used for the discretization of the boundaries restricting semi-infinte walls to finite lengths due to the requlrity conditions as $y \to \infty$. The complete solution is obtained in terms of the velocity and the induced magnetic field together with the convergence analysis of infinite integrals using boundedness conditions of the velocity and the induced magnetic field, and the properties of Bessel functions that appear in the fundamental solution for large arguments. The results are obtained for several values of Hartmann number (M), boundary conductivity parameters (λ,k) discussing the effect of these parameters on the solution. It is found that when the connecting wall is perfectly conducting and semi-infinite walls have constant conductivities $\pm k$, an increase in M causes boundary layer formations near the side walls and the fluid becomes stagnant at the center of the channel. For the varying conductivities on all the walls, fluid concentrates in front of the connecting wall and the induced magnetic filed obeys the conductivity variation. BEM gives the solution at a small computational expense due to its boundary only nature.

Keywords: MHD, BEM, Semi-Infinite Channel.

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A General Solution to a Dynamical Problem of Continuous Media Having Cubic Nonlinearities

B.Gültekin Sınır
Department of Civil Engineering, Manisa Celal Bayar University,
Muradiye, Manisa, Turkey
gultekin.sinir@cbu.edu.tr

Sümeyye Sınır
Department of Mechanical Engineering, Bilecik Şeyh Edebali University,
Bilecik, Turkey
sumeyye.sinir@cbu.edu.tr

Abstract: In this study, a general model having cubic nonlinearities on dynamic problems is represented. The general model shows the presence of a non-linear damping, inertia and geometry. The general model is modified to be able to solve ordinary differential equations. As a solution technique, direct application of the multiple time scale method that is a powerful technique in dynamics analysis is chosen. The general solution procedure is applied some mathematical models. The solutions obtained by using general model are the same as the solution in the literature. It is seen that, the presence of non-linear inertia and the geometric terms make the non-linear natural frequencies to be dependent on constant amplitude of vibration. But, when damping nonlinearities are present, it is seen that the amplitude is exponentially time-dependent, and so, the nonlinear natural frequencies will be logarithmically time-dependent.
Keywords: General Model, Multiple Time Scales, Cubic Nonlinearities, Non-Linear Inertia, Non-Linear Damping, Non-Linear Frequencies.

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Kinematic Surfaces with Constant Scalar Curvature in Euclidean 5-Space

Emad Solouma
Department of Mathematics & Statistics, College of Science,
Al Imam Mohammad Ibn Saud Islamic University,
Riyahd, Kingdom of Saudi Arabia
emadms74@gmail.com

Abstract: An equiform transformation in the n-dimensional an Euclidean space E^n is an affine transformation whose linear part is composed by an orthogonal transformation and homothetical transformation [2-6]. Such an equiform transformation maps points $x \in E^n$ according to the rule

$x \mapsto sAx + d,\ A \in SO(n),\ s \in R^+,\ d \in R^n$ (1)

The number s is called the scaling factor. An equiform motion is defined if the parameters of (1), including s, are given as functions of a time parameter t. Then a smooth one-parameter equiform motion moves a point x via

$x(t) = s(t)A(t)x(t) + d(t)$. The kinematic corresponding to this ransformation group is called similarity kinematics. See [1]. In this paper we study the scalar curvature S of kinematic surfaces foliated by a similarity kinematics of an egg-pear curve in the five dimensional Euclidean space E^5. We prove that the if scalar curvature S is constant, then $S = 0$. We describe the equations that govern such the surfaces. Finally examples of kinematic surfaces with zero scalar curvature are given.

Keywords: Kinematic Surfaces, Egg-Pear Curve, Scalar Curvature, Similarity Kinematics.

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Fuzzy Complex System Reliability Analysis Using Depth-First Search

Halil Ibrahim Sahin, Melek Eris
Department of Statistic and Computer Sciences , Karadeniz Technical University, Trabzon, Turkey
hisahin@ktu.edu.tr, melekeris@ktu.edu.tr

Abstract: An Engineering system can be modeled as a serial, parallel, serial-parallel, redundancy, k-out-of-n or complex and analysis its reliability according to these models [1]. In some situations component/system reliability is not crisp [2-3]. In this study fuzzy complex reliability is analysed. Tie-Set method is choosen for analyzing system reliability. In order to find all paths from input to output, we apply depth-first search in a graph [4]. Of particular interest are the minimal tie-sets. We eliminate some paths are contained within minimal tie-sets and then use rules of union of sets for finding system reliability.Fuzzy approach is used for evaluating the component and system reliability. Reliability of each component is represented with fuzzy triangle membership function. Transition from component reliability to system reliability is obtained by implementation of fuzzy arithmetic operations. To get estimate reliability of the complex system in the fuzzy sense, defuzzify is used.

Keywords: Depth-First Search, Fuzzy, Reliability.

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Interpretation of Syllogisms on Boolean Algebras

Ibrahim Sentürk, Tahsin Oner, Urfat Nuriyev
Department of Mathematics, Ege University,
Bornova, Izmir, Turkey
ibrahim.senturk@ege.edu.tr, tahsin.oner@ege.edu.tr, urfat.nuriyev@ege.edu.tr

Abstract: The first systematic solution for syllogisms was introduced by the Greek philosopher Aristotle[1]. In the 19th. and 20th. centuries, George Boole[2], Lewis Caroll[3] and Jan Łukasiewicz[4] made a significant contribution in the realm of analysis of categorical syllogisms. In this study, we shall scrutinize interpretation of syllogisms on Boolean Algebras. Accordingly, we firstly construct categorical syllogisms together with a representation of syllogistic arguments by using sets. Thereafter, we compare this interpretation method with the George Boole's algebraic approach to Syllogistic Logic in *The Laws of Thought* in 1854.

Keywords: Categorical Syllogisms, Boolean Algebras, Carrolls' Diagram Method

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Self-Organizing Topological Maps for Classification of the Hercynian Granitoids From Their Geochemical Characteristics: Case of the Aouli Pluton (High Moulouya, Morocco)

Abdelghani Talhaoui[1], Imad Manssouri[2], Abdellah El Hmaidi[1], Mohamed Berrada[3], Tajeddine Manssouri[4]

[1]*Team of Sciences of Water and Environmental Engineering, Faculty of sciences, University Moulay Ismail, B.P. 11201, Zitoune, Meknès- Morocco.*
talhaouiabdelghani25@gmail.com ; elhmaidi@yahoo.fr;

[2]*Laboratory of Mechanics, Mechatronics and Command, ENSAM Engineering high school, University Moulay Ismail, BP 4042, 50000, Meknès, Morocco.*
imade_mansouri@yahoo.fr;

[3]*Laboratory of Mathematical Modelling and Computing, ENSAM Engineering high school, University Moulay Ismail, BP 4042, 50000, Meknès, Morocco.*
berrada.mohamed@gmail.com;

[4]*Laboratory of Geo-Engineering and Environment, Faculty of Science, University Moulay Ismail, B.P. 11201, Zitoune, Meknès- Morocco.*
t.manssouri@yahoo.fr;

Abstract: The study of rare earth, trace elements and major elements allows distinguishing of the various entities of a plutonic complex. The present work focus on the application of the model of unsupervised classification based on the self-organizing topological maps (SOM). The database contains 167 samples of Hercynian granitoid rocks of the Aouli pluton (High Moulouya, Morocco). The data correspond to the contents of major elements, trace elements and rare earths, and are composed respectively of 11 samples of granodiorite, 81 samples of gray granite, 70 samples of pink granite and 5 samples of muscovite granite. The map size was taken 15x11 neurons which allow minimizing the quantization error (QE) and the topological error (TE). Hierarchical clustering on the SOM has allowed to highlight four classes. The 11 samples of the granodiorite have been well classified in class 1 with 100%. Those of gray granite were distributed in class 2 with 32%, class 3 with 19.7% and class 4 with 48.1%. For the pink granite, the corresponding samples were mostly classified in class 3 with 91.4% and in class 2 and 3 with 4.2% each one. For the muscovite granite, 80% of corresponding samples were classified in class 4 and 20% in class 3. This study highlighted the classification capability of the self-organizing maps (SOM) on all the Hercynian granitoid rocks of the Aouli pluton.

Keywords: Unsupervised classification, Self Organizing Maps Hercynian granitoids, Aouli Pluton, High Moulouya.

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Demonic Operational and Denotational Semantics Commute

Fairouz Tchier
Mathematics department,
King Saud University, P.O.Box 22452
Riyadh 11495, Saudi Arabia
ftchier@ksu.edu.sa

Abstract: Semantics is the study of meaning of languages. Operational semantics describes the effect of each statement on the state-usually giving the post-state as a function of the pre-state. Denotational semantics defines a translation into some (partial) function space usually defined in set/category theory [2]. The meaning of a program is a (partial) function/relation in that space. The angelic semantics is the input/output relation obtained by considering the best execution of the program if there is a possibility to terminate it will terminate. It corresponds to the choice that termination is guaranteed as long as termination is possible. The demonic semantics is the input/output relation by considering the worst execution of the program; if there is a possibility for the program not to terminate normally, then it will not terminate normally [1]. Our aim is to show that relational demonic operational semantics of nondeterministic program and its demonic denotational semantics commutes.
Keywords: Demonic Operational Semantics, Demonic Denotational Semantics Relational Semantics.
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On a Fractional Model Arising in Spintronics

Mouhcine Tilioua
M2I Laboratory, MAMCS Group
FST Errachidia
P.O Box 509 Boutalamine
52000 Errachidia
Morocco
m.tilioua@fste.umi.ac.ma

Abstract: We study the existence of weak solutions to a fractional model arising in spintronics. The model consists on fractional Landau-Lifshitz-Gilbert equation coupled to a fractional diffusion equation modelling spin transfer in ferromagnetic sample. We apply the Galerkin method to get an approximate solutions and we use a fractional calculus inequality will play a critical role in the convergence of the nonlinear terms.

Keywords: Ferromagnetism, Spintronics, Fractional Derivatives, LLG Equation.

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Existence and Multiplicity of Positive Solutions for Fractional Boundary Value Problems

Fatma Serap Topal
Department of Mathematics, Ege University,
Bornova, Izmir, Turkey
f.serap.topal@ege.edu.tr

Abstract: In this paper, by introducing a new operator, improving and generating a p-Laplace operator for some p > 1, we discuss the existence and multiplicity of positive solutions to the four point boundary value problems of nonlinear fractional differential equations. Our results extend some recent works in the literature.

Keywords: Positive Solutions, Fractional Differential Equations, Fixed Point Theorems.

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Applying Graph Coloring to Schedule Doctors' Work in Hospital

Fardous Toufic and Khouloud Al-Gahtani
ftoufic@ksu.edu.sa
4322010960@ksu.student.sa

Abstract: In this paper; we present an application of graph theory to schedule doctors 'or nurses' work .We choose an algorithm and modify it to find a solution for that problem. We will present a comparaison of our work to previous given algorithms to solve this problem.
Keywords: Graph Theory, Coloring Graphs, And Algorithms.

A-Compactly Uniform Integrability of Sequences of Random Elements

Mehmet Unver
Department of Mathematics, Faculty of Science,
Ankara University, Ankara, Turkey
munver@ankara.edu.tr

Abstract: In this talk we introduce a new type of uniform integrability for sequences of Banach valued measurable functions (random elements) by using Bochner integral so that we generalize the concept of A-compactly uniform integrability. Furthermore, we study the concepts of A-strong convergence and A-statistical convergence, which are some of the main concepts of the summability theory, for sequences of random elements and we investigate the relationship among these concepts by using this new type of uniform integrability.
Keywords: Sequence of Random Element, Uniform Integrability, A-Statistical Convergence, A-Strong Convergence.

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Solution to General Weakly Non-Linear Dynamic Problem

Leyla Usta
Department of Mathematics, Manisa Celal Bayar University,
Muradiye, Manisa, Turkey
leylausta.3461@gmail.com

B.Gültekin Sinir
Department of Civil Engineer, Manisa Celal Bayar University,
Muradiye, Manisa, Turkey
gultekin.sinir@cbu.edu.tr

Abstract: In this study, we consider a dynamic system having a single degree of freedom under the influence of general forces, $f(u,\dot{u},\ddot{u})$. We do not restrict f to be an analytic function of deflection (u), velocity $(\dot{u})$ and inertia $(\ddot{u})$. Specifically, we consider the equation

$$\ddot{u}+\omega_0^2 u=\varepsilon f(u,\dot{u},\ddot{u}) \tag{1}$$

where ε is a small dimensionless parameter. The function f is general but piecewise continuous. The equation

$$\ddot{u}+u=\varepsilon f(u,\dot{u}) \tag{2}$$

is solved in the literature [1]. The effect of quadratic term is disappeared on the solution [1]. In our study, we added inertia term into f and we developed a new solution procedure to show the effect quadratic non-linearity on the solution. A perturbation technique called the multiple time scale method is used to solve the equation. Some special cases are presented. The solution procedure is generalized for higher order nonlinearities.

Keywords: Multiple Time Scale, Nonlinear Vibration, General Solution. Fourier Transform.

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Self-Dual Codes and the Steenrod Algebra

Tane Vergili and Ismet Karaca
Department of Mathematics, Ege University,
Bornova, Izmir, Turkey
tane.vergili@ege.edu.tr ismet.karaca@ege.edu.tr

Abstract: All stable cohomology operations with coefficient group Z_2 constitute an algebra, called the mod 2 Steenrod algebra A [2]. Each of its finite sub Hopf algebras A(n) determined by a fixed profile function for $n \geq 1$ [4] has a Frobenius ring structure so they allow us to construct codes over themselves. Codes over A(n) for $n \geq 1$ was first studied in [6]. In this work, we construct the Euclidean and the Hermitian self-dual codes over A(n). This work shows that Euclidean and Hermitian self-dual codes exist in all length over A(n) and unlike the mod 2 Steenrod algebra, the sub algebra A(n) is not prime for all $n \geq 1$.

Keywords: Steenrod Algebra, Frobenius Ring, Algebraic Coding Theory.

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Integral Equation Methods for the Planar Exterior Robin Boundary Value Problem of the Laplacian

Olha Ivanyshyn Yaman, Gazi Ozdemir
Department of Mathematics, Izmir Institute of Technology, Izmir, Turkey
gaziozdemir@iyte.edu.tr

Abstract: The Laplace equation arises in many areas in physics and mathematics, such as electromagnetism, fluid mechanics, heat conduction, geometry etc. The Robin or impedance condition models the situation when the boundary absorbs some part of the energy, heat, mass, which is transmitted through it. It is well-known that the problem has a unique solution, [1].

We propose a method for the numerical solution of the problem which is based on a boundary integral equation. Since the fundamental solution to the Laplace equation is logarithmic in 2D, we apply a modification which keeps it bounded in the unbounded domain. Representing the solution by a modified single-layer potential we reduce the differential problem in an unbounded domain to the Fredholm integral equation of the second kind over the boundary. Investigating the properties of the integral operators and employing the Fredholm alternative we show that the obtained boundary integral equation has a unique solution. Numerically, the integral equation is solved by the Nyström method based on weighted trigonometric quadratures on an equidistant mesh, [2]. This approach guarantees exponential convergence for analytic boundaries and boundary data. The feasibility of the numerical method and convergence order is verified by numerical examples.

Keywords: Laplacian, Robin Boundary Condition, Layer Potentials, Nyström Method, Fredholm Alternative, Boundary İntegral Equations.

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On Numerical Radius and Berezin Number Inequalities for Reproducing Kernel Hilbert Space

Ulas Yamanci and Mehmet Gurdal
Department of Mathematics, Suleyman Demirel University,
ulasyamanci@sdu.edu.tr, gurdalmehmet@sdu.edu.tr

Abstract: The fundamental inequality $w(A^n)\leq w^n(A)$, $(n=1,2,...)$ for numerical radius is studied in the literature. But, the inverse inequalities for numerical radius is not well known in the literature. For this reason, by using Hardy-Hilbert type inequalities, we give inverse numerical radius inequality for Reproducing Kernel Hilbert Space. Also, we get inverse power inequality for Berezin number of operators

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A Note on Power Central Values of Generalized Skew Derivations with Annihilating Conditions

Nihan Baydar Yarbil
Department of Mathematics, Ege University,
Bornova, Izmir, Turkey
nihan.baydar.yarbil@ege.edu.tr

Abstract: In recent years a number of authors have been treating the additive mappings of a ring and examining the behaviour of these mappings. In most of the cases the results provide useful informations about the structure of the ring and the map. In this line we handled a problem in which a generalized skew derivation of a ring constructing a power central identity. Let G be a generalized skew derivation of a prime ring R with center $Z(R)$ and extended centroid C, $a \in R$ and n is a fixed positive integer. If $aG(x)^n \in Z(R)$ for all $x \in R$ then $aG(x) = 0$ unless $\dim_C RC = 4$. We conclude with a generalization of this result to noncommutative Lie ideals of R. This is a joint work with Nurcan Argaç.

Keywords: Prime Ring, (Generalized) Derivation, (Generalized) Skew Derivation, Lie Ideal.

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New Analytic Solutions of the Space-Time Fractional Cahn-Hilliard Equations

Handan Cerdik Yaslan
Department of Mathematics, Pamukkale University,
Denizli, Turkey
hcerdik@pau.edu.tr

Abstract: In the present study, new analytical solutions for the space-time fractional Cahn-Hilliard equation with the Jumarie's modified Riemann-Liouville derivative of order α and β are obtained using tanh method with the fractional complex transform. The accuracy and efficiency of the method is shown by numerical examples.

Keywords: The Space-Time Fractional Cahn-Hilliard Equation, Fractional Complex Transform, Modified Riemann-Liouville Derivative, Tanh Method.

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Multi-point Boundary Value Problems on an Unbounded Time Scale

Ismail Yaslan and Mustafa Gunendi
Department of Mathematics, Pamukkale University,
Denizli, Turkey
iyaslan@pau.edu.tr, mustafa_87875@hotmail.com

Abstract: In this paper, we establish the criteria for the existence of at least one and three positive solutions for nonlinear second order multi-point time scale boundary value problem on infinite interval by using the Leray-Schauder fixed point theorem and the five functionals fixed point theorem, respectively.
Keywords: Boundary value problems, Cone, Fixed Point Theorems, Positive Solutions, Time Scales.
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Results on Soft Continuous Functions in the Soft Topological Spaces Equipped with Soft Scott Topology

Gozde Yaylalı, Bekir Tanay
Mjuğla Sıtkı Koçman University, Muğla, Turkey
gozdeyaylali@mu.edu.tr

Abstract: In this study, some properties of Soft Scott Topology are examined; and some relations between Soft Scott Topology and Way Below Soft Set Relations are shown. Also the notion of Soft Scott continuous function on Soft Topological Spaces, which is equipped with Soft Scott topology, is defined by focusing on the structure of the continuity of soft function and some examples are illustrated.

Keywords: Soft Set, Soft Topology, Soft Continuous Function, Soft Scott Topology.

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Idempotent and Nilpotent Subsemimodules of Semimodules

Gulsah Yesilkurt
Department Of Mathematics, Yıldız Technical University, MSc Student
Davutpaşa /Güngören, Istanbul, Turkey
gulsahyesilkurt@gmail.com

Abstract: In this work we investigate some properties of semirings and semimodules. First we give some characterization of Noetherian semirings and show that the set of nonnegative integers is a Noetherian semiring by showing the characterization of all ideals of nonnegative integers. Second we give the definition of idempotent and nilpotent subsemimodules of semimodules. Further we give some properties of its.

Keywords: Semiring, Semimodule, Idempotent and Nilpotent Subsemimodule, Ideals, *k*-ideals.

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Convolution and Approximation in Weighted Lorentz Spaces

Yunus Emre Yildirir
Department of Mathematics, Balıkesir University,
Necatibey Education Faculty, Balıkesir, Turkey
yildirir@balikesir.edu.tr

Abstract: The convolution type transforms play an important role in the many areas of the theoretical and applied mathematics. Particularly, these transforms are very useful in the approximation theory for the constructions of the approximating polynomials. Therefore, we need to study the relations between these transforms and the best approximation numbers. Such problems were investigated by some authors in Lebesgue, Orlicz and weighted Orlicz spaces [1, 2, 3]. In this paper, we obtain that the similar results are valid in weighted Lorentz spaces. For this, we prove the multiplier theorem and Littlewood-Paley theorem in weighted Lorentz spaces with Muckenhoupt weights.

Keywords: Convolution Type Transform, Weighted Lorentz Space, Best Approximation, Muckenhoupt Weight.

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k-Chinese Postman Problem Approach for Snow Plowing Operations: A Case Study

Mustafa Yilmaz, Merve Kayaci Codur
Department of Industrial Engineering, Atatürk University,
Erzurum, Turkey
mustafay@atauni.edu.tr, mkayaci@atauni.edu.tr

Abstract: Snow plowing activity involves the removal of snow from roadways and sidewalks, loading snow into vehicles and transporting snow to disposal sites in modern socities during winter. These operations in a region is accomplished with a set of vehicles or trucks with specialized equipment. The routing of vehicles that plow through travelling all roads is critically important in terms of cost and distance. In current practice, determine the route of these vehicles is largely manual and primarily relies on the knowledge and judgment of drivers. In this study is focused on k-Chinese Postman Problem (k-CPP) is a multiple vehicle variant of the CPP, which has many real-world applications. The k-CPP model approach is based on mathematical optimization for the finding a set of vehicle routes that cover all roads at least once with a minimum cost. The different variants of the k-CPP model under different assumptions are applied to a snow plowing operations conducted on the network of University of Atatürk at campus and the results are compared.

Keywords: Arc Routing, Chinese Postman Problem, *k*- Chinese Postman Problem

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On Soft R_IC-Continuous Functions

Yunus Yumak and Aynur Keskin Kaymakci
Department of Mathematics, Selcuk University,
Campus, Konya, Turkey
yunusyumak@yahoo.com
akeskin@selcuk.edu.tr

Abstract: Firstly, we introduce and study a new the notion in soft ideal topological space, called *soft f_I-set*. Secondly, we obtain that the notion of *soft f_I-set* is stronger than the notion of *soft regular-I-closed set* and weaker than the notion of *soft semi-I-open set*. To give a decomposition of *soft continuous function* for *soft regular-I-closed sets* we define the concepts *soft R_IC-continuous*, *soft f_I-continuous* and *soft contra*-continuous functions*. Finally, we show that a function $f_{pu} : (X, \tau, E, I) \to (Y, \phi, V)$ is *soft R_IC-continuous* if and only if it is *soft f_I-continuous* and *soft contra*-continuous functions.*

Keywords: Soft Regular-I-Closed, Soft F_i-Set, Soft Regular-I-Continuity, Soft Ideal Topology.

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A Bound for the Number of Symmetric Colorings of a Finite Group

Yuliya Zelenyuk
School of Mathematics, University of the Witwatersrand,
Johannesburg, South Africa
yuliya.zelenyuk@wits.ac.za

Abstract: Let G be a finite group and let r be a natural number. An r-coloring of G is any mapping χ: G→{1,…r}. A coloring of G is symmetric if there exists an element g in G such that $\chi(gx^{-1}g) = \chi(x)$ for every x from G [1,2]. We show that if G is not Boolean, then the number of symmetric r-colorings of G does not exceed $nr^{7n/8}$, where n = |G|, and consequently, if r>1, the probability that an r-coloring of G is symmetric approaches to 0 as n tends to infinity [3].
Keywords: Symmetric Coloring, Finite Group, Boolean Group.
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One by One Embedding the Crossed Hypercube into Pancake Graph

Mohamed Faouzi Zerarka, Smain Femmam
Polytechnic Engineers School Labs EPF, 3 bis rue Lakanal, 92330 Sceaux, France.
faouzi.zerarka@gmail.com

Abstract: Let *G* and *H* be two simple undirected graphs. An *embedding* of the graph *G* into the graph H is an injective mapping *f* from vertices of *G* to the vertices of *H*. The *dilation* of embedding is the maximum distance between $f(u),f(v)$ taken over edges (u,v) of *G*. The Pancake graph is one as viable interconnection scheme for parallel computers, which has been examined by a number of researchers. The Pancake was proposed as alternatives to the hypercube for interconnecting processors in parallel computer. Some good attractive properties of this interconnection network include: vertex symmetry, small degree, a sub-logarithmic diameter, extendability, and high connectivity (robustness), easy routing and regularity of topology, fault tolerance, extensibility and embeddability of others topologies. In this paper, we give a construction of one by one embedding of dilation 5 of crossed hypercube into Pancake graph.