2nd INTERNATIONAL ONLINE CONFERENCE ON DIFFERENTIAL EQUATIONS, CONTROL AND OPTIMIZATION

27-30 October 2021

Istanbul, Turkey

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2nd INTERNATIONAL ONLINE CONFERENCE ON DIFFERENTIAL EQUATIONS, CONTROL AND OPTIMIZATION
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Chair Opening Speech

Dear Participants, first of all, thank you very much for your interest in International Online Conference on Differential Equations, Control and Optimization, 27-30 Oct 2021, Istanbul, Turkey.

This is the second edition of the our conference and we are happy due to high interest to conference. About 90 people have submitted their papers and after review process, only 27 papers is accepted for presentation and conference special issue. Our 27 participants are from nine different countries which are Portugal, Malaysia, Turkey, Morocco, Algeria, Somali, Bulgaria, Slovakia, India.

Also, on behalf of organizing committee, I present our deepest and special thanks to our keynote Speakers Sandra Pinelas, Mehmet Emir Köksal due to their contributions to conference.

The third edition of this conference will be organized as both face to face and online in the next September in Istanbul.

I hope that you will enjoy.

Thank you very much for your participation and interest.

Kenan Yıldırım, PhD

Chair on DECOP'21 27 October 2021-Istanbul

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Difference & Differential Equations of Mixed Type

Sandra Pinelas / Invited Speaker

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Abstract

The difference equations is related with differential equations as the discrete mathematics is related with the continuous mathematics. However the methods used to study the behavior of this equations can be very different because some properties of the difference equations don't hold when we study the differential equations. Usually it is easier to work with difference equations. On this work we will analyse the oscillatory behavior of some difference equations and differential equation and to establish some similarities and differences in the used methods.

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Commutativity of Time-Varying Linear Systems

Mehmet Emir Koksal / Invited Speaker

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Abstract

In this talk, the concept of commutativity for continuous-time and discrete-time linear time-varying systems is considered. Necessary and sufficient conditions for the commutativity of time-varying linear systems are presented. Decomposition and transitivity properties are defined. Some applications of commutativity in real life are presented.

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On decay and blow-up of solutions for a system of viscoelastic wave equations with logarithmic nonlinearity

Nazlı Irkıl, Erhan Pişkin

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Abstract

We focused on the interplay between Kirchhoff terms and logarithmic sources.

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Decomposition of Third-Order Discrete-Time Linear Time-Varying Systems into Its Second- and First-Order Commutative Pairs

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Abstract

Decomposition is a common tool for the synthesis of many physical systems. It is also used for analyzing large-scale systems which are then known as tearing and reconstruction. On the other hand, commutativity of cascade-connected systems has gained a great deal of interest, and its possible benefits have been pointed out on the literature. In this presentation, necessary and sufficient conditions for decomposition of any third-order discrete-time linear time-varying system as a commutative pair of first- and second-order systems are investigated. Further, additional requirements in case of nonzero initial conditions are derived. Theoretical statements are supported by numerical experiments using MATLAB.

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On One Type of Symmetric Matrices with Harmonic Fibonacci Entries

Mücahit Akbıyık[1], Seda Yamaç Akbıyık[2], Fatih Yılmaz[3]

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[2]Computer Engineering, Istanbul Gelisim University, Istanbul, Turkey
[3]Mathematics, Ankara Hacı Bayram Veli University, Ankara, Turkey

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Abstract

In this paper, we define a specially constructed matrix whose entries are harmonic Fibonacci numbers and give its Hadamard exponential matrix. Also, we give a lot of admiring algebraic properties for both of them. Finally, a MATLAB-R2016a code is presented to facilitate the calculations and to further enrich the content.

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Mathematical behavior of solutions for a logarithmic p-Laplacian equation with distributed delay

Erhan Pişkin, Hazal Yüksekkaya

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Abstract

In this article, we concerned with a logarithmic p-Laplacian equation with distributed internal delay. Firstly, we obtain the global existence of solutions by utilizing the well-depth method. Later, under appropriate assumptions on the weight of the delay and that of frictional damping, we establish the exponential decay. Moreover, we obtain the blow up results for negative initial energy.

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On Solutions of Beam Equation with Impulses

Martina Langerova

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Abstract

We consider the fourth-order boundary value problem with restoring and external forces given as a sum of continuous function and Dirac delta distribution. Sufficient conditions for the existence and uniqueness of a positive or negative solution, respectively, are presented. Our problem serves as a model for simply supported beam under continuous and discrete load.

This is based on results of the joint work with Pavel Drabek.

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On Ricci Semi-Symmetric Mixed Quasi-Einstein Hermitian Manifold

Mohd Vasiulla, Quddus Khan and Mohabbat Ali

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Abstract

In this paper, we have studied about Bochner Ricci semisymmetric mixed quasi-einstein Hermitian manifold and holomorphically projective Ricci semi-symmetric mixed quasi-Einstein hermitian manifold.

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Qualitative analysis of solutions for a class of logarithmic Kirchhoff equation with distributed delay

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Abstract

In this article, we concerned with a logarithmic Kirchhoff equation with distributed internal delay. Firstly, we obtain the global existence of solutions by using the well-depth method. Later, under appropriate assumptions on the weight of the delay and that of frictional damping, we establish the exponential decay. Moreover, we obtain the blow up results for negative initial energy.

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Riemannian Submersions Endowed with a Semi-Symmetric Metric Connection

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Abstract

In this paper we study Riemannian submersions from a Riemannian manifold with a semi-symmetric metric connection onto a Riemannian manifold. We investigate O'Neill's tensor fields for semi-symmetric metric connection, check the Schouten connection derive the covariant derivative of O'Neill's tensor fields. We show that these tensors are not skew symmetric. We obtain derivatives of those tensor fields and compare curvatures of the total manifold, the base manifold and the fibers by computing curvatures.

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New Integro-Differential Nonlinear VolterraChandrasekhar Equation

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Abstract

In this paper, we investigate the solution's existence and uniqueness for a new integro-differential nonlinear Volterra-Chandrasekhar equation. We approximate the solution of this equation by using Nystrome method. The accuracy and efficiency of this method are illustrated in some numerical examples.

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On Generalized Recurrent Riemannian Manifolds

Mohabbat Ali

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Abstract

In this paper, we have studied about generalized recurrent Riemannian manifold and investigated some geometric properties of this manifold under certain curvature conditions. Finally, the existence of generalized recurrent Riemannian manifold have been shown by a non-trivial example.

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Iterative Method for Three-point Boundary Value Problem for Third Order Differential Equations

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Abstract

A third order three-point boundary value problem on a half-line is considered. Based on the application of lower and upper solutions an algorithm for constructing two monotone convergent sequences of successive approximations is provided. Both sequence are convergent and in the case their limits coincide this limit is a solution of the considered problem. Some examples are given to illustrate the suggested algorithm.

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Eigenvalues of infinite non-compact star graph

Gökhan Mutlu

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Abstract

We consider the Schrödinger operator on an infinite non-compact star graph which has countably infinite number of semi-infinite rays emanating from the single vertex of the graph. We impose the most general vertex conditions at the central vertex. We transfer this boundary value problem on the infinite non-compact quantum star graph to Schrödinger equation on the half-line with operator coefficients in an infinite dimensional separable Hilbert space. We obtain the characteristic function of this boundary value problem which is the Jost function of the Schrödinger equation on the half-line with operator coefficients.

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Hybrid Matrices

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Abstract

In this paper, we firstly define the matrices with hybrid numbers entries. We then give basic properties of hybrid matrices by writing these matrices as a combination of real matrices. Finally, we examine the real matrix representation of hybrid matrices using the base elements.

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Iterative Technique for Impulsive Fractional Functional Differential Equation-" Controllability Criterion"

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Abstract

In this manuscript, we explore the controllability of impulsive fractional functional differential equation using iterative technique. By employing Laplace transformation and Mittag-Leffler function the solution representation is derived. The necessary and sufficient condition for controllability is established by using Banach contraction principle. Numerical examples are given to illustrate the theoretical results and its diagrammatic representations are explored by MATLAB.

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Existence and uniqueness of solutions for a second order discrete systems of two-points BVPs

Noor Halimatus Sa'diah Ismail[1] , Mesliza Mohamed[2] , Mazura Mokhtar@Mother[3] , Syazwani Zainal Abidin[4] , Asyura Abd Nasir[5] , and Amirah Hana Binti Mohamed Nor[6]

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Abstract

In this paper, we study the existence and uniqueness of solutions for second-order discrete systems for two-points boundary value problem by using the fixed point approach in vector Banach space. The existence result is given by means of Schauder, and the existence and uniqueness of solutions is obtained via fixed point theorem due to Perov. An example is provided to illustrate the theory.

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Existence and Uniqueness of Solutions for a First-Order Discrete Systems

Mazura Mokhtar[2] , Mesliza Mohamed[1] , Noor Halimatus Sa'diah[2] , Asyura Abd Nasir[1] , Amirah Hana Mohamed Nor[1] , and Syazwani Zainal Abidin[2]

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Abstract

The purpose of this paper is to study the existence and uniqueness of solutions to two-point boundary value problems for first order discrete systems using fixed point approach in vector Banach space. The existence results are given by means of Schauder and the existence and uniqueness of the solution is obtained via a fixed point theorem due to Perov. Two examples are presented to illustrate the theory.

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A Fast Multilevel Method for Selective Segmentation model of 3-D Digital Images

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Abstract

Image segmentation which can be classified into global and selective segmentation is a challenging topic from viewpoint of both model and algorithm development. Global seg mentation models can segment the whole objects in an image, but unable to segment a specific object that is required for extraction. To overcome this limitation, the selective segmentation type which is capable of extracting an object or region in a given image must be prioritized. Recently, a 3-D convex variational selective segmentation model has been proposed and solved using projection algorithm that capable of extracting a particular object in a given image. For moderate size of image, the projection algorithm method is effective. However, as the image size is larger, a fast iterative solver need to be develop. This paper first proposes a fast multilevel algorithmin in 3-D formulation that has the optimal complexity to solve the recent 3-D selective segmentation model. To achieve faster convergence, we reformulate the recent 3-D model into a new localized model. Test results demonstrated that our model is capable of successfully segmenting a targeted object in optimal computational time. Advantages of our algorithm can be seen in processing large size of 3-D images, where magnitudes of speed-up are observed over competing algorithms.

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Comparative numerical study of an interior points approach based on new descent directions for linear programming

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Abstract

In this work, a comparative numerical study of a primal-dual interior point method based on recent descent directions is presented. We give a numerical appreciation of the numerical behavior of the considered algorithm taking into account the number of iterations as well as the time needed for optimality. The results obtained show the e¢ ciency of these new directions.

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A new subclass of Salagean-Type Multivalent Harmonic Function Defined by Subordination

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Abstract

In this work, we have introduced a new subclass of Salagean-Type multivalent harmonic functions. We give the coefficient bounds, distortion theorems, extreme points, convolution and convex combinations for this subclass of functions. Furthermore, other related results are given as corollaries.

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Asymptotic behaviour of solutions for Kirchhoff-type parabolic system with logarithmic source term

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Abstract

This paper deals with the initial-boundary value problem for Kirchhoff-type parabolic system with logarithmic source term. We discuss the global existence and exponential energy decay estimates of weak solutions under some conditions by employing potential method.

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On The Horadam Hybrid Quaternions

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Abstract

In this study, we define the Horadam hybrid quaternions and present some of their properties. Moreover, we studied the relationship between the Fibonacci hybrid quaternions and the Lucas hybrid quaternions which connecting the Fibonacci quaternions and Lucas quaternions. We also provide the Binet formulas and Cassini identities for these hybrid quaternions.

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Problem of $p(x)$-Kirchhoff type with singular weights

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Abstract

In this paper, we consider the p(x)-Kirchhoff problem with convection term and singular weights, namely

$$-M\left(\int_{\Omega}\frac{1}{d^{\alpha}}|\nabla u|^{p(x)}\mathrm{dx}\right)\ \mathrm{div}(\frac{1}{d^{\alpha}}|\nabla u|^{p(x)-2}\nabla u)=\frac{1}{d^{\beta}}h(x,u)+\frac{1}{d^{\gamma}}g(x,\nabla u)$$

in Ω. With a priori estimates and by using Galerkin's approach, we prove the existence of at least one solution to this problem.

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On Some Results on $N(k)$-Contact Metric Manifolds

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Abstract

In this study, some geometric properties of $N(k)$ −contact metric manifolds, which are important class of contact manifolds, have been investigated using a special connection. By using this connection, $N(k)$ −contact metric manifolds have been studied under certain special conditions of the generalized quasi-conformal curvature tensor.

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Semi-invariant Submanifolds of Normal Complex Contact Metric Manifolds

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Abstract

In this paper, we study on semi-invariant submanifolds of normal complex contact metric manifolds. We give the definition of such submanifolds and we obtain useful relations. Moreover, we give the integrability conditions of distributions.

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Numerical solutions of generalized Rosenau-Kawahara-RLW equation using finite element method

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Abstract

Nonlinear wave phenomena appear in many fields, such as fluid mechanics, plasma physics, applied mathematics, in engineering problems, biology, hydrodynamics, solid state physics and optical bers. In order to better understand these nonlinear phenomena, it is important to explore their exact solutions. But exact solutions of these equations are commonly not derivable, particularly when the nonlinear terms are contained. In so far as only limited classes of these equations are solved by analytical means, numerical solutions of these nonlinear partial differential equations are very operable to examine physical phenomena [1]. In this work, we have obtained numerical solutions of the generalized RosenauKawahara-RLW equation by using collocation finite element method. To show the effectivity and proficiency of the method, error norms L2, L∞ and invariant IE have been computed. A linear stability analysis based on a Fourier method states that the numerical scheme is unconditionally stable.We will conceive the following generalized Rosenau-Kawahara-RLW equation

$$U_t + \varepsilon U_x + \beta U^p U_x + \gamma U_{xxx} - \alpha U_{xxt} + \lambda U_{xxxxt} - \zeta U_{xxxxx} = 0 \qquad (1)$$

with the homogeneous boundary conditions

$$\begin{array}{ll} U(a,t) = 0, & U(b,t) = 0, \\ U_x(a,t) = 0, & U_x(b,t) = 0, \\ U_{xx}(a,t) = 0, & U_{xx}(b,t) = 0, \quad t > 0 \end{array} \qquad (2)$$

and an initial condition

$$U(x,0) = U_0(x) \qquad a \le x \le b, \qquad (3)$$

where p is a positive integer, α, λ are positive constants and ε, β, γ, ζ are all real constants [2]. Numerical solutions of the equation have been studied in recent years. Zuo [3] have implemented sech ansatz and tanh ansatz method to produce exact bright and dark 1-soliton solutions of the general Rosenau-Kawahara-RLW equation. He and Pan [4] have developed a three-level linearly implicit finite difference scheme based on

sine-cosine method for solving the equation. He [5] produces the exact 1 solitary wave solution for the perturbed Rosenau–Kawahara-RLW equation with power law nonlinearity and then improve a three-level linearly implicit difference algorithm for solving the equation. A three level conservative fourth-order finite difference scheme for the initial boundary value problem of the generalized RosenauKawahara-RLW equation has been improved by Wang and Dai [6].

References

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[5] D. Hea, Exact solitary solution and a three-level linearly implicit conservative finite difference method for the generalized Rosenau–Kawahara-RLWequation with generalized Novikov type perturbation, Nonlinear Dynamics, 85(1) (2016), 479-498.

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12.40-13.00	**Noor Halimatus Sa'diah Ismail**-Existence And Uniqueness Of Solutions For A Second Order Discrete Systems Of Two-Points Bvps
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13.20-13.40	**Seifedine Kadry**-The investigation of solutions of a linear homogeneous system of

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15.40-16.00	**Bülent Alçın**-A certain subclass of bi-

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	univalent analytic functions
16.00-16.20	**Inan Ünal**-Semi-İnvariant Submanifolds Of Normal Complex Contact Metric Manifolds
16.20-16.40	**Nazlı İrkil**, on Decay And Blow-Up Of Solutions For A System With Logarithmic Nonlinearity
16.40-17.00	**Mücahit Akbıyık** on one type of symmetrıc matrıces wıth harmonıc fıbonaccı entrıes

DECOP'21 CONFERENCE PROGRAMME	
27 October 2021- Room A	
Time	**Presenter And Title Of Presentation**
10.00-10.30	**Delfim F. M. Torres/Invited Speaker at Main Room**
10.35-11.05	**Sandra Pinelas/Invited Speaker at Main**

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	Room
11.10-11.40	**Mehmet Emir Köksal/Invited Speaker at Main Room**
11.40-13.00	**BREAK**
13.00-13.20	**Hazal Yüksekkaya**, Mathematical behavior of solutions for a logarithmic p-Laplacian equation with delay
13.20-13.40	**Hazal Yüksekkaya**, Qualitative analysis of solutions for a class of logarithmic Kirchhoff equation with delay
13.40-14.00	**Ferhat Kürüz** On the Horadam Hybrid Quaternions
14.00-14.20	**Esra Erkan**, Hybrid Matrices
14.20-14.40	**Gökhan Mutlu** Eigenvalues of infinite non-compact star graph
14.40-15.00	**Hakan Demir**, Riemannian submersions endowed with a semi-symmeric metric connection
15.00-15.20	**Adnan Canbulat**, A new subclass of

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	Salagean-Type Multivalent Harmonic Function Defined by Subordination
15.20-15.40	**Hakan Zeybek**-Numerical solutions of generalized Rosenau-Kawahara-RLW equation using finite element method
15.40-16.00	**Tugrul Cömert** Asymptotic behaviour of solutions for Kirchhoff-type parabolic system with logarithmic source term
16.00-16.20	**Mohd Vasiulla**, On Ricci semi-symmetric mixed quasi-Einstein Hermitian manifold
16.20-16.40	**Zaoui Billel**, Comparative numerical study of an interior points approach based on new descent directions for LP.
16.40-17.00	**Mohabbat Ali**, On Generalized Recurrent Riemannian Manifolds
17.00-17.20	**Muthuselvan Kanagaraj**, New techniques on controllability of fractional differential

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	equations
17.20-17.40	