2020년 KSCAM 여름 학술논문발표대회

한국전산응용수학회

프로그램 및 초록집

2020년 KSCAM 여름 학술논문발표대회

The Korean Society for Computational and Applied Mathematics

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August 20, 2020

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2020
KSCAM 학술발표회

The Korean Society for
Computational and Applied Mathematics

학 술 발 표 일 정

구분 / 시간	제 1 발표장		제 2 발표장		제 3 발표장	
	좌장	발표자	좌장	발표자	좌장	발표자
10:00~10:10	회장님 학술대회 개회사					
10:10~ 10:50	초청강연1-정영주					
10:50~ 11:00	Tea Break					
11:00~ 11:40	초청강연2-Su Hu					
11:40~ 11:50	Photo Time					
11:50~ 13:20	점심시간					
13:20~ 13:40	이희영	김영록	황치옥	원유진	김대열	박 호
13:40~ 14:00		정남순		강점란		김민수
14:00~ 14:20		강정욱		김세정		소지석
14:20~ 14:40	강정욱	이희영	강점란	황치옥	김민수	김대열
14:40~ 15:00		김아현		우창화		임정욱
15:00~ 15:20		유천성		김현정		노금환
15:20~ 15:40	Tea Break					권민재
15:40~ 16:00	포스터 및 학술회의 토의 (임원 회의)					
16:00~ 16:40	발표상 시상,기념 촬영 및 폐회					

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AM-04	A research on the degenerate generalized (p,q)-poly-Bernoulli numbers and polynomials	정남순
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AM-11	Interpolation of the Parameterized Ordered Means of Positive Invertible Operators	김세정
AM-12	Computational Mathematics using Mathematica Symbolica: Last-passage Algorithm Development	황치옥

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2020
한국전산응용수학회
학술발표대회

논문초록집
Abstract

2020 KSCAM 학술발표회 초록집 차례

AM-01

Symbolic Computation Using Mathematica for Advanced Manipulation of Mathematical Expressions

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Symbolic computing, in contrast to numerical computing, is computation with variables and constants according to the rules of algebra for manipulation and evaluation of mathematical expressions. Computer-based mathematical analysis has the advantages of elimination of human errors and enhancement of accuracy during calculation by using the symbolic computing methods and computer software incorporating known algorithms and mathematical formulas. Symbolic Computing package is an add-on package that facilitates symbolic computation in Mathematica. It contains over 900 functions and its own interpreter language for notation, manipulation and evaluation of various mathematical expressions. The package is designed to replace hand-written calculation with symbolic computation and software-based automation. It has various features for compactness and versatility to handle complex problems that are not directly solvable with the Mathematica kernel functions. This approach provides a powerful platform for streamlined manipulation of mathematical expressions while affording seamless integration with the technical computing environment of Mathematica. Among the advantages are good readability, enhanced speed and accuracy, focusing on concepts and principles rather than tedious, boring, time-consuming and error-prone hand-written calculation. This presentation will discuss the key features of the package and will show some examples of automated manipulation of mathematical expressions.

AM-02

Ramanujan expansions of arithmetic functions of several variables on the polynomial ring over finite fields

Su Hu

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Let $A = F_q[T]$ be the polynomial ring over finite field F_q, and A_+ be the set of monic polynomials in A. In this talk, we show that the arithmetic functions of multi-variables over A_+ can be expanded through the polynomial Ramanujan sums and the unitary polynomial Ramanujan sums. These are analogues of classical results over the ring of integers by Winter, Delange and Toth. This is a joint work with Tianfang Qi.

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AM-03

PARTIALLY DEGENERATE HERMITE POLYNOMIALS AND LOCATION OF THEIR ZEROS

Young Rok Kim

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In this paper, we introduce the partially degenerate Hermite polynomials and obtain some properties for partially degenerate Hermite polynomials. Differential equations arising from the generating functions of partially degenerate Hermite polynomials are studied.
Finally, we investigate the structure and symmetry of the zeros of the partially degenerate Hermite equations.

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AM-04

A research on the degenerate generalized (p,q)-poly-Bernoulli numbers and polynomials

Nam Soon Jung

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In this paper, we research on the analytic properties for the degenerate generalized (p,q)-poly-Bernoulli numbers and polynomials with (p,q)-logarithm function and explore some symmetric identities that is concerned with the generalized falling factorial sum.

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AM-05

A research on the q-Bernoulli polynomials using q-trigonometric functions

Jung Yoog Kang

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In this talk, we construct q-cosine and q-sine Bernoulli polynomials. From these polynomials, we find some properties and identities. We also observe the structure of the roots for the q-cosine and q-sine Bernoulli polynomials. Through numerical experimentation, we look for various assumptions about these polynomials.

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AM-06

A note the multiple Hurwitz -Euler eta function $\eta_r(s,a)$

Hui Young Lee*, Seo Jong Jin

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Choi and Srivastava constructed and made formular about the multiple Hurwitz-Euler eta function $\eta_r(s,a)$ defined by following r-ple series

$$\eta_r(s,a)=\sum_{k_1k_2\cdots k_r=0}^{\infty}\frac{(-1)^{k_1+k_2+\cdots+k_r}}{(k_1+k_2+\cdots+k_r+a)^s}\quad,\ Re(s)>0,a>0,r\in N$$

The main topic of this presentation is to represent $\eta_r(s,a)$ with other form as below;

$$\eta_n(s,a)=\sum_{k=1}^{\infty}\left(\sum_{i_1=1}^{k}\left(\sum_{i_2=1}^{i_1}\left(\sum_{i_3=1}^{i_2}\left(\cdots\sum_{i_{n-1}=1}^{i_{n-2}}1\right)\right)\right)\frac{(-1)^{k-1}}{(k-1+a)^s}\right).$$

Proof uses mathematical induction.

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AM-07

Research on Carlitz's type high-order (p,q)-Genocchi polynomials

Ahyun Kim*, Cheon Seoung Ryoo

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In this talk, we will discuss Carlitz's type high-order (p,q)-Genocchi polynomials. To do so, we define Carlitz's type high-order (p,q)-Genocchi polynomials and Carlitz's type high-order (h,p,q)-Genocchi polynomials. We also explore a variety of properties of Carlitz's type high-order (p,q)-Genocchi polynomials. In addition, we find alternating (p,q)-power sums. Thereby, we express symmetric identities using alternating (p,q)-power sums.

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AM-08

Zeros of the degenerate Bell-Carlitz polynomials

Cheon Seoung Ryoo*, Eun Joo Lee

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In this talk, In this paper we define a new degenerate Bell-Carlitz polyno mials. It also derives the differential equations that occur in the generating function of the degenerate Bell-Carlitz polynomials. We establish some new identities for the degenerate Bell-Carlitz polynomials. Finally, we per form a survey of the distribution of zeros of the degenerate Bell-Carlitz polynomials.

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AM-09

Image Restoration Using Fixed-point-like and split Bregman Methods for A TVL2D2 Regularization Model

Yu Jin Won*, Jae Heon Yun

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In this talk, we first propose a new total variation TVL2D2 regularization model for image restoration. We next propose two iterative methods which are fixed-point-like method and split Bregman method, using CGLS (Conjugate gradient least squares method), for solving the new TVL2D2 model, and then we provide convergence analysis for the two iterative methods. In order to evaluate the effectiveness of two iterative methods for the TVL2D2 model, we provide numerical experiments for several test problems. This can be done by comparing their performances for TVL2D2 model with those of the fixed-point and split Bregman methods for the existing TVL2I2 model.

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AM-10

Blow-up results for viscoelastic wave equations with weak damping

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In this work, we consider a viscoelastic wave equation of the form

$$u_{tt} - \Delta u + \int_0^t g(t-s)\Delta u(s)ds + h(u_t) = |u|^{p-2}u, \quad in\ \Omega \times R^+,$$

with Dirichlet boundary condition. There are much literature on the blow-up result of solutions for the wave equation with damping term having polynomial growth near zero. However, to my knowledge, there is no blow-up result of solutions for the viscoelastic wave equation without polynomial growth near zero assumption on the damping term. This work is devoted to study a finite time blow-up result of solution with nonpositive initial energy as well as positive initial energy without imposing any restrictive growth near zero assumption on the damping term.

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AM-11

Interpolation of the Parameterized Ordered Means of Positive Invertible Operators

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From a family of the ordered means for positive invertible operators equipped with homogeneity and properties related with the Loewner partial order, we construct a parameterized ordered mean. Considering two families of parameterized ordered means associated with the power mean, we see that they monotonically interpolate given two parameterized ordered means and show their order relations.

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AM-12

Computational Mathematics using Mathematica Symbolica: Last-passage Algorithm Development

Chi-Ok Hwang

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Using Mathematica Symbolica, we further develop the last-passage Monte Carlo algorithm for the charge density on a flat conducting surface by deriving a generalized last-passage Green's function on the flat surface. In the previous research, we used a centered Green's function on the flat surface. In the new last-passage algorithm, we can use also an off-centered point on the surface inside the Green's function hemisphere. To demonstrate the algorithm, we calculate the charge density on a circular disk and find that our result agrees very well with the analytic solution.

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AM-13

On the complex curvuture functions via elastica slant curves in the real 4-dimensional complex projective plane

Changhwa Woo

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In this talk, we study closed slant curves in complex 2-dim. complex projective space which are critical points of the elastic energy. Let $CP^2(4)$ be the 2-dimensional complex projective space of constant holomorphic sectional curvature 4, endowed with complex structure J, Fubini-Study metric < , > and Levi-Civita connection ∇. Given a reparametrized unit speed curve γ(t), $\gamma : [0,1] \to CP^2(4)$ smoothly immersed in $CP^2(4)$. If γ is a geodesic, then it is critical as we know. If rank(γ)=1, then it can be shown that γ lies, as an extremal of Enegy funtional F_a, in either a totally geodesic complex $S^2(4)$ or in a totally geodesic totally real RP^2. These cases have been basically studied in the previous section. By using complex Frenet frame along the curve, we classify closed elastic proper slant curves in $CP^2(4)$ and show that they form a one-parameter family of helices.

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AM-14

A lower estimate for the first Dirichlet eigenvalue on compact manifolds

Hyun Jung KIM

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In this talk, we prove a new estimate on the lower bound of the Dirichlet eigenvalues on compact Riemannian manifolds with the condition that the Ricci curvature is bounded below by a negative constant.
Our estimate improve the earlier result by P. Li and S.T. Yau.

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AM-15

The convolution sums for Lucas sequences

Ho Park

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Given two integers P and Q, Lucas sequences $U_n(P,Q)$ and $V_n(P,Q)$ which are the generalizations of Fibonacci numbers and Lucas numbers satisty the recurrence relation $a_n = P \cdot a_{n-1} - Q \cdot a_{n-2}$ with initial conditions $U_0(P,Q)=0$, $U_1(P,Q)=1$ and $V_0(P,Q)=2$, $V_1(P,Q)=P$. We easily check that $U_n(1,-1)$ and $V_n(1,-1)$ are the Fibonacci number and the Lucas numbers, respectively. A. Kim showed the formulas of convolutions sums for Fibonacci numbers and Lucas number. In this presentation, we provide the such convolution sums for Lucas sequences $U(P,Q)$ and $V(P,Q)$.

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AM-16

Generalized Euler power series

Min-Soo Kim

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In this talk, we give a power series expansion of $L_{p,E}(s,t;\chi)$ in the variable t about any $\alpha \in \mathbb{C}_p$, $|\alpha|_p \leq 1$. Furthermore, we prove that

$$E_{-n,\chi}(t) = \sum_{m=0}^{\infty} \binom{-n}{m} E_{-(m+n),\chi} t^m, \ n \in \mathbb{N},$$

where $t \in \mathbb{C}_p$ with $|t|_p < 1$. We also obtain some properties of these functions.

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AM-17

Study of Alzer-Kwong's identities for Bernoulli polynomials

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In this talk, we obtain some new identities for Bernoulli polynomials by using a p-adic integral over Z_p. This formula extends two Theorems obtained by Alzer and Kwong's identities.
Also, some known identities for Bernoulli numbers and polynomials are obtained by our approach.

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AM-18

Coefficients of etat quotient with 6

Daeyeoul Kim

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In this talk, we will introduce properties of coefficients of eta quotients with respect to 6. These coefficients are related to the restricted divisor function. Therefore, this study has a connection with the result of studying the convolution sum of the divisor function.

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AM-19

Graded S-Noetherian rings

Dong Kyu Kim, Jung Wook Lim*

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In this talk, we introduce the concept of graded S-Noetherian rings and characterize when a graded ring is a graded S-Noetherian ring.

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AM-20

An Optimal Consumption and Investment Problem with a Subsistence Consumption Constraint and Quadratic-Featured General Utility

Kum-Hwan Roh*, Yong Hyun Shin

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Department of Mathematics, Sookmyung University,
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We study optimal consumption and investment problem of an economic agent who has a general utility function with pre-fixed bliss level of consumption and subsistence constraints. We use a dual transform method for obtaining an explict solution of optimization problem.

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AM-21

Thermal-elastic characteristics due to influence of thickness in thermal barrier coatings

Jaegwi Go

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The thermoelastic behaviors of such as temperature distribution, displacements, and stresses in thermal barrier coatings (TBC) are seriously influenced by top coat thickness and edge conditions. The top coat of TBC specimens prepared with TriplexPro™-200 system was controlled by changing the processing parameter and feedstock, showing the various thicknesses and microstructures. A couple of governing partial differential equations were derived based on the thermoelastic theory. Since the governing equations were too involved to solve analytically, a finite volume method was developed to obtain approximations. The thermoelastic behaviors of TBC specimens with the various thicknesses and microstructures were estimated through mathematical approaches with different edge conditions. The results demonstrated that the microstructure and thickness of the top coat, and the edge condition in theoretical analysis were crucial factors to be considered in controlling the thermoelastic characteristics of plasma-sprayed TBCs.

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AM-22

Existence and exponential estimates of the solution to stochastic differential equations

Mun-Jin Bae*, Young-Ho Kim

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In this presentation, we first introduce the basic concepts used in stochastic differential equations. This main aim of this presentation investigates the existence and uniqueness of the solutions to stochastic differential equations under special conditions. In addition, we establish the exponential estimation of the solution for the equations.

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AM-23

An Existence and Uniqueness Theorem of Stochastic Differential Equations and the Properties of Their Solution

Chan-Ho Park*, Mun-Jin Bae, Young-Ho Kim

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In this presentation, we first introduce definition of solution of the stochastic differential equation. We show the existence and uniqueness of solution to stochastic differential equations under weakened Hölder condition and a weakened linear growth condition. Furthermore, the properties of their solutions investigated and estimate for the error between Picard iterations $x_n(t)$ and the unique solution $x(t)$ of stochastic differential equations.

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AM-24

The Principle of Differential Subordination and Its Application to Integral Operators

Seon Hye An*, Nak Eun Cho

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In the present talk, we give some subordination and superordination properties of certain integral operators by using the principle of differential subordinations introduced by Miller and Mocanu which plays a crucial role on the study of geometric function theorey. The sandwich-type results for these integral operators are also introduced.

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AM-25

On Hilbert rings

Hyung Tae Baek*, Jung Wook Lim

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In this talk, we study some properties of Hilbert rings. More precisely, we investigate to study the S-finiteness of maximal ideals and the (composite) numerical semigroup ring extension.

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AM-26

Deep Reinforcement Learning for trading

Min Jae Kwon, Jung Wook Lim*

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In this talk, we apply Reinforcement Learning (RL) techniques to stock market trading. First of all, we will introduce some basic concepts relevant to reinforcement learning. Next, we will show some results related to performances of the algorithm.

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