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Papers Abstracts
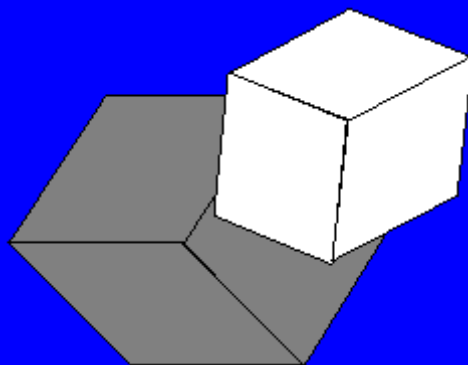
ON THE GENERALIZED DRAZIN INVERSE IN A BANACH ALGEBRA

Xiaoji Liu, Yonghui Qin, Julio Benitez

We give the representations of $(a + b)^{\mathsf{d}}, (a + ab)^{\mathsf{d}}$ and $(a + ba)^{\mathsf{d}}$ in terms of a, b, a^{d} and b^{d} being elements of a Banach algebra with $a^3b = ba$ and $b^3a = ab$. We also give the representations of $(a + b)^{\mathsf{d}}$ under the assumptions $a^3b = ba$, $\|a^{\mathsf{D}}b\| < 1$, and $\|(1 - aa^{\mathsf{D}})b^{\mathsf{D}}a\| < 1$.

SOME RESULTS ON HYPERVECTOR SPACES

O.R. Dehghan, R. Ameri, H.A. Ebrahimi Aliabadi

The aim of this paper is to study hypervector spaces. In this regard at first some new nontrivial examples of hypervector spaces are introduced. Then the notions of linearly span, linearly independence, basis, ordered basis, coordinates and linear transformation are investigated and some related results are obtained. Especially, it is proved that for a linear transformation $T : V \to W$ between two hypervector spaces, $\dim \ker T + \dim T(V) = \dim V$, and under certain conditions $\dim L(V, W) = \dim V \times \dim W$.

NEW IMPROVEMENT OF HEINZ INEQUALITIES FOR MATRICES

Yuming Feng

In this paper we mainly discuss Heinz inequalities involving unitarily invariant norms. By using the Hermite-Hadamard inequality, we get some refinements of the Heinz inequalities, thus new improvements of Heinz Inequalities for matrices are obtained. Our results are different from those of [7,1,3,6,8].

RESEARCH ON A CLUSTERING ANALYSIS ALGORITHM FOR OPTIMAL ALLOCATION OF HUMAN RESOURCES IN COLLEGES AND UNIVERSITIES

Gangmin Weng, Jingyu Zhang

With the development of digitalization, more and more colleges and universities have applied information management technology into the optimal allocation of human resources. How to manage the growing number of human resource management data and mine their potential laws to realize the optimal allocation

of human resources in colleges and universities has become a top priority. In this paper, an improved k-means algorithm was introduced and its superiority was verified through an experiment by comparing the results before and after improvement. The result showed that the calculation time and complexity of the improved algorithm decreased greatly, suggesting that it could be applied for the optimal allocation of human resources in colleges and universities.

(pp. 49–57)

THE NUMERICAL RANGE OF AN ELEMENT OF A CLASS OF TOPOLOGICAL ALGEBRAS

E. Ansari-Piri, M. Sabet

Kinani, Oubbi and Oudadess (1998) show that every unital and commutative locally convex algebra with a jointly continuous product is β - subadditive, for which β is the boundedness radius. In this paper we obtain some results on numerical range of an element in β - subadditive algebras. To do this, at first, we study the dual space of topological algebras for which the boundedness radius is finite. Furthermore, we prove some new results for linear and multiplicative linear functionals on a class of topological algebras.

(pp. 58–64)

A SHORT NOTE ON IDEMPOTENT RINGS

J. A'zami

In this paper we introduce a new class of rings that we say idempotent rings. We call a ring R is idempotent, if every ideal of R is generated by an idempotent element. In this paper we prove some properties of this rings, where one of the important results is the following:

Let $t \geq 2$ be an integer number. Then the ring $\mathbb{Z}_t$ is an idempotent ring if and only if $t = p_1 p_2 \ldots p_n$, where all of the p_i are distinct prime numbers.

(pp. 65–69)

ERROR ESTIMATES OF FINITE VOLUME ELEMENT METHOD FOR NONLINEAR HYPERBOLIC OPTIMAL CONTROL PROBLEMS

Z. Lu, L. Li, Y. Feng, L. Cao

The goal of this paper is to investigote the error estimates of the fininte volume element approximation of optimal control problems governed by nonlinear

hyperbolic equations. By using optimize-then-discretize, variational discretization and the finite volume method to solve the distributed optimal control problems. A semi-discrete optimal system is obtained. Meanwhile, we obtain the optimal order error estimates in $L^\infty(J; L^2)$ and $L^\infty(J; H^1)$-norm.

ON HYPER BCH-ALGEBRA

M.S. Ali Khan, K. Rahman, S. Abdullah, F. Hussain

In this paper we initiate the concept of a hyper BCH-algebra which is a generalization of a BCH-algebra, and hyper BCK/BCI algebras and investigate some related properties. Moreover we introduce a hyper BCH-ideal, weak hyper BCH-ideal and strong hyper BCH-ideal in hyper BCH-algebras, and give a few relations among these hyper BCH-ideals. Finally we define homomorphism of hyper BCH-algebras.

ON THE p-NILPOTENCE OF FINITE GROUPS

Xianhe Zhao, Longqiao Zhou, Shirong Li

In this paper, we give a new definition–a CSS subgroup(a subgroup H of a finite group G is called a CSS-subgroup of G if there exists a normal subgroup K of G such that $G = HK$ and $H \cap K$ is SS-quasinormal in G). By this definition, we investigate the relationship between the p-nilpotence of G and the p-nilpotence of $N_G(P)$, and generalize the corresponding results to a saturated formation $\mathcal{F}$ which contains the class $\mathcal{N}_p$ of all p-nilpotent groups, where p is an odd prime factor of $|G|$, P a Sylow p-subgroup of a group G.

ECONOMIC BENEFIT EVALUATION OF FOREST ECO-TOURISM ATTRACTIONS BASED ON FACTOR ANALYSIS

Qiong Sun, Xiuping Nie, Zhiyong Tan, Wei Su

With the rapid development of economy, the tourism in China has flourished and eco-tourism has emerged. Eco-tourism is an inexorable trend in the sustainable development of tourism. Requirements for eco-tourism attractions are compared to ordinary tourist attractions. This study selected the forest eco-tourist attraction in Yunnan as an example because Yunnan has a warm climate, beautiful sceneries and rich forest resources. The economic benefits

of the attraction were analyzed using factor analysis method. Score was calculated through extracting common factor, the index variables were processed, and the index results were then applied to the solution formulas. The obtained economic benefit results were analyzed and compared. Finally, relevant suggestions were proposed for local government, citizens and tourists. This work provides a reference for the economic construction and development of forest eco-tourism attractions in the future.

ON THE GENERALIZATION OF $(\in, \in \vee q)$-INTUITIONISTIC FUZZY BI-IDEALS OF SEMIGROUPS

M.S.A. Khan, A. Ali, F. Amin, K. Rahman, S. Abdullah, F. Hussain

In this article, we introduce the notion of $(\in, \in \vee q_k)$-intuitionistic fuzzy subsemigroup, $(\in, \in \vee q_k)$-intuitionistic fuzzy left (resp. right) ideals, $(\in, \in \vee q_k)$-intuitionistic fuzzy bi-ideals and $(\in, \in \vee q_k)$-intuitionistic fuzzy $(1, 2)$-ideals and study some of its properties. We study the related properties of the $(\in, \in \vee q_k)$-intuitionistic fuzzy bi-ideals, $(1, 2)$-ideals and in particular, an $(\in, \in \vee q_k)$-fuzzy bi-ideals and $(1, 2)$-ideals in semigroups will be investigated.

THE FORM OF AUTOMORPHISMS OF AN ABELIAN GROUP HAVING THE WEAK EXTENSION PROPERTY

S. Abdelalim, M. Zeriouh, M. Ziane

Let A be an abelian group and let α be an automorphism of A. In this paper we show that if the restriction of α to any p-component A_p of A is of the form: $\alpha_{\restriction A_p} = \pi id_{A_p} + \rho$, where p is a prime number, π a p-adic invertible number and $\rho \in Hom(A_p, A^1)$ with A^1 is the first subgroup Ulm of the group A. Then α satisfies the weak extension property.

SOME NEW PROPERTIES ON λ-COMMUTING OPERATORS

A. Tajmouati, A. El Bakkali, M. A. Mohamed Baba

In this paper, we study the operator equation $AB = \lambda BA$ for a bounded linear operators A, B on a complex Hilbert space. We focus on algebraic relations between different operators that include normal, M-hyponormal, quasi $*$-paranormal and other classes.

LIE IDEALS WITH SYMMETRIC LEFT BI-DERIVATIONS IN PRIME RINGS

C. Jayasubba Reddy, S. Vasantha Kumar, K. Madhusudhan Reddy

Let R be a prime ring and U be a nonzero lie ideal of R. A symmetric bi-additive mapping $D(.,.) : R \times R \to R$ is called a symmetric bi-derivation and d is a trace of D. In this paper we shall show that $U \subseteq Z(R)$ such that R admitting the trace d satisfying the several conditions of symmetric left bi-derivation.

DETERMINATION OF THE SHORTEST PATH IN VAGUE NETWORKS

P.K. Kishore Kumar, S. Lavanya, H. Rashmanlou, M.N. Jouybari

We propose a new approach to determine the shortest path in a vague network(VN), a network in which vertices and edges remain crisp but each edge $(i, i+1)$ has an associated weight, which is a vague number of the form $[R_{it}, R_{if}]$ for each i. For each VN, we associate two vague networks called true and false limit fuzzy networks having the same set of vertices and edges but each edge $(i, i + 1)$ is attached with a vague weight R_{it} and R_{if} respectively. We exhibit that the shortest path of weight $w = [w_t, w_f]$ an vague number in VN, the path for which the shortest path of weight w_t in the true fuzzy network coincides with the shortest path of weight w_t in the true limit vague network. The concept is illustrated with the help of a simple situation and the validation of mathematical verification is provided.

NEW CONCEPTS IN INTERVAL-VALUED INTUITIONISTIC FUZZY GRAPHS

S. Lavanya, P.K. Kishore Kumar, H. Rashmanlou, M.N. Jouybari

Intuitionistic fuzzy graphs is a highly growing research area as it is the generalization of the fuzzy graphs. In this paper, we introduce the concept of Interval-valued Intuitionistic fuzzy graphs(IVIFG), we also analyse some properties of IVIFG based on morphism such as weak isomorphism, co-weak isomorphism and some concepts on automorphism.

LINEAR CODES ON UNITARY SPACE

Mahdieh Hakimi Poroch, Ali Asghar Talebi

Linear codes are an important class of codes. They are the most studied codes from a mathematical point of view. In this work, we propose linear codes in unitary space, then describe a way for finding a new parity check matrix of linear codes in unitary space. In the end, we give a decoding procedure for linear codes in unitary space.

A CATASTROPHIC TEMPERATURE CHANGE IN THE HEAT EQUATION

B.G. Sidharth, Abhishek Das

In this paper we modify the heat equation with the inclusion of a delta function contribution and find the solution of such an equation. It is found that there is an abrupt rise in the temperature across the board.

RESEARCH ON THE DEVELOPMENT OF BUSINESS MODEL BASED ON MOBILE APPs

Yun Zhang

As the mobile Internet develops rapidly, it is playing an increasingly important role in people's daily life nowadays. Mobile ends such as mobile phones and pads lift the time and place limitations of applications (APPs) and APP users spend more time on mobile ends than on the PC end. This paper mainly studies the business models of mobile APPs. Firstly, the theoretical basis related to this study is described. Then, taking a reading APP-QQ reading as an example, we studies its business model from the aspects of industrial chain model, profit model, communication channels and market positioning and makes a multi - level fuzzy comprehensive evaluation on it. Finally, suggestions are put forward to solve the problems found by evaluation. The study of the business model of reading apps is conducive to the development of new functions of reading software to protect readers' loyalty.

ON THE ELEMENTARY AND BASIC CHARACTERS OF $G_n(q)$

Chrisper Chileshe, J. Moori, T. T Seretlo

We discuss in this paper the elementary and basic characters of $G_n(q)$. The paper highlights the main idea that every irreducible character of $G_n(q)$ appears uniquely in the basic characters. In particular we determine the elementary and basic characters of $G_3(q)$ for any q. As examples, the theory is also applied to $G_3(2)$, $G_3(3)$ and $G_4(2)$.

THE CONDITIONS OF EXISTENCE OF A SOLUTION OF THE TWO-POINT IN TIME PROBLEM FOR NONHOMOGENEOUS PDE

Zinovii Nytrebych, Oksana Malanchuk

The existence of a solution of the problem with local homogeneous two-point in time conditions for nonhomogeneous PDE of the second order in time and generally infinite order in spatial variables was investigated in the classes of entire functions. The case when the characteristic determinant of the problem is identically zero was studied. We proposed the differential-symbol method of constructing the solution of the problem.

MULTIGROUPS AND MULTICOSETS

Yuming Feng, B.O. Onasanya

The present Cantor's set theory has limitations. In various ways, it cannot well represent realities because an element x, in Cantor's sense, is either in or not in X. Even, when $x \in X$, it can only occur once; no repetition is allowed. But so many real life problems are only well represented by sets which allow repetition(s), such as multiset. Such cases arise in, though not limited to, database query, chemical structures and computer proramming.

In this paper, we have some results on the algebraic structure of multisets and some properties of their multicosets.

REVERSES OF THE TRIANGLE INEQUALITY FOR ABSOLUTE VALUE IN HILBERT C^*-MODULES

A. Mansoori, M.E. Omidvar, H.R. Moradi, S.S. Dragomir

In this paper we obtain some inequalities related to the reverse triangle inequalities for vectors in the framework of Hilbert C^*-modules. Also we improve a celebrated reverse triangle inequality due to Diaz and Metcalf. As a consequence, we apply our results to get some operator inequalities.

(pp. 262–273)

THE BICLIQUE PARTITION NUMBER OF SOME IMPORTANT GRAPHS

Eman Rawshdeh, Hasan Al-Ezeh

The biclique partition number of a graph G, $bp(G)$ is the minimum number of complete bipartite subgraphs needed to partition the edge set of G. Let $r(G) = \max\{n_+(G), n_-(G)\}$ where $n_+(G), n_-(G)$ are the number of positive and the number of negative eigenvalues of the adjacency matrix of G, respectively. A graph G satisfying, $bp(G) = r(G)$ is called an eigensharp graph. In this paper we apply Pollak and Graham Theorem to find the biclique partition number of the line graph of complete graph and its complement, the line graph of complete bipartite graph and its complement and the line graph of a tree graph and we discuss the eigensharp property of these graphs. Also we identify the biclique partition number of the $kth-$power graph of paths and cycles.

(pp. 274–283)

A CONCISE PROOF OF A DOUBLE INEQUALITY INVOLVING THE EXPONENTIAL AND LOGARITHMIC FUNCTIONS

Huan-Nan Shi, Shan-He Wu

In this note we provide a concise proof for a double inequality involving the exponential and logarithmic functions, our method is based on the usage of the majorization inequalities and the Schur-convexity of a function.

(pp. 284–289)

CRITERION FOR NONEXISTENCE HORSESHOE-LIKE IN C^1 TOPOLOGY

Alireza Zamani Bahabadi

n this paper we show that if $\Lambda \subset M$ is a closed invariant set and $p \in \Lambda$ is a hyperbolic saddle periodic point satisfying condition A with real and positive eigenvalues, then Λ is not horseshoe-like.

(pp. 290–296)

NON-LINEAR STABILITY OF L_4 IN THE R3BP WHEN THE SMALLER PRIMARY IS A HETEROGENEOUS TRIAXIAL RIGID BODY WITH N LAYERS

Abdullah A. Ansari, Kumari Shalini, Ziyad A. Alhussain

In the present paper, the non-linear stability of the triangular libration point (L_4) in the restricted three-body problem(R3BP) when less massive primary is a heterogeneous triaxial rigid body has been studied with the assumption that the primary has N layers having different densities. Following the procedure of Birkhoff's normalization, we normalized the Hamiltonian up to second order and the co-ordinates (x, y) are expanded in double D'Alembert series. The non-linear stability of the triangular libration point is discussed by applying Moser's modified version of Arnold's theorem (1961) as well as following the procedure as adopted by Bhatnagar and Hallan (1983). It is observed that Moser's theorem is applicable in the range of linear stability, except for three mass ratios depending upon heterogeneous triaxial rigid body.

(pp. 297–312)

WEAKLY θ_I-PREOPEN SETS AND DECOMPOSITION OF CONTINUITY

Manisha Shrivastava, Takashi Noiri, Purushottam Jha

In this paper we introduce and study the notion of weakly θ_I-preopen sets and weakly θ_I-precontinuous functions to obtain a decomposition of continuity. We also investigate their fundamental properties.

(pp. 313–331)

OBJECT-ORIENTED ROAD EXTRACTION BASED ON IMPROVED FCM AND SHAPE FILTER IN HIGH RESOLUTION RS IMAGERY

J. Jin, J.W. Dang, Y.P. Wang, F.W. Zhai

An object-oriented method of road extraction is proposed for high-resolution remote sensing imagery aiming to its characteristics. At first, bilateral filter is used in original imagery to smooth detail information and retain road edge; then it proposes an improved Fuzzy C-Means algorithm combined with the neighborhood information in order to deal with outliers better, so the imagery is segmented to independent objects by improved FCM algorithm; and then it filters every objects by geometric feature, after that it connects road segments to get network by region growing algorithm and executes post-processes by morphology method. The experiments show that the method can extract the road target efficiently from high resolution imagery with higher accuracy.

RESEARCH ON THE OPTIMIZATION OF PATH INFORMATION IN THE PROCESS OF LOGISTICS DISTRIBUTION BY IMPROVED ANT COLONY ALGORITHM

Jiaxin Wang

Whether the logistics distribution path is reasonable determines distribution speed and distribution efficiency. In this research, the ant colony algorithm is introduced in detail, and a mathematical model of the algorithm is established for the characteristics of logistics distribution problems, and the algorithm is further improved and optimized on convergence rate and global searching ability. The experimental results showed that the improved algorithm optimized the logistics distribution path and could find the optimal path scheme quickly and effectively, proving that it is feasible and promising in the optimization of logistics distribution paths.

THE 1-PLANARITY OF INTERSECTION GRAPH OF IDEALS OF A RING

Eman A. Abuhijleh, Manal Al-Labadi, Hasan Al-Ezeh

A graph $G = (V(G), E(G))$ is called 1-planar if it can be drawn in the plane such that every edge of the graph is cut by at most one other edge of the graph. For any ring R, the ideal intersection graph of R, denoted by $G(R)$, is the graph whose vertices are the nontrivial proper ideals of R and two distinct vertices

are adjacent if they have nontrivial intersection. In this paper, we characterize when the intersection graph $G(R)$ of a ring R, is 1-planar.

RESEARCH ON PERSONALIZED RECOMMENDATION ALGORITHM OF CROSS-BORDER E-COMMERCE UNDER LARGE DATA BACKGROUND

Shujun Ji

With the expansion of the E-commerce industry, the coverage of goods is becoming increasingly wider. Moreover, foreign E-commerce industries have gradually expanded to the Chinese market, resulting in higher requirements of domestic consumers on the safety, variety and cost performance of foreign products. Therefore, how to make the sales of cross-border E-commerce more stable and keep the balance of cross-border E-commerce inventory and sales is an urgent problem to be solved. As traditional modes are not suitable for foreign E-commerce industries, a personalized recommendation system with favorable big data processing capacity is needed to address the problem. This paper introduced a common personalized recommendation system and applied the collaborative filtering algorithm as the main algorithm of the system to solve problems in practice. The results showed that the improved collaborative filtering recommendation system could meet the requirement of the times and was worth being promoted.

ASSIMILATION OF INSAT-3D SOUNDER RETRIEVED THERMODYNAMIC PROFILES USING WRF MODEL FOR EXTREME RAINFALL EVENT OVER NORTH CENTRAL PART OF INDIA

H.S. Lekhadiya, R.K. Jana

The impact of Indian National Satellite-3D (INSAT-3D) retrieved thermodynamic profiles (temperature and humidity) on Weather Research Forecasting (WRF) model forecast is examined in this study. The extreme rainfall event which occurred during July 25-26, 2015 over the North central part of India is taken as the case study. The analysis obtained after assimilation is compared with the European Centre for Medium-Range Weather Forecasts (ECMWF) analysis. Obtained results show quite good improvement in humidity and temperature analysis when compared with ECMWF analysis. Positive improvements are observed in 24 h WRF model predicted rainfall on assimilation of INSAT-3D temperature and humidity profiles.

A LOCAL MESHLESS RBF METHOD FOR SOLVING FRACTIONAL INTEGRO-DIFFERENTIAL EQUATIONS WITH OPTIMAL SHAPE PARAMETERS

Mehdi Safinejad, Mahmoud Mohseni Moghaddam

This paper investigates the application of the meshless local radial basis functions collocation method (LRBFCM) for the numerical solution of fractional integro-differential equation and two-dimensional fractional Volterra integral equation. Unlike the traditional global RBF collocation method, dividing the collocation of the problem in the global domain into many local regions, and therefore, the ill-conditioning of the problem is reduced and becomes highly stable. Here, we use the multiquadric (MQ) radial basis function that includes a shape parameter, which plays an important role in the accuracy of method. Scaling of the shape parameter to make local RBF approximation insensitive is performed by particle swarm optimization (PSO) algorithm. Some test problems are studied and the numerical results shows the efficiency of the method.

ON BI-Γ-IDEALS IN Γ-SEMIGROUPS WITH INVOLUTION

M.Y. Abbasi, Abul Basar, Akbar Ali

The concept of involution in semigroups was given by Nordahl et al [13]. In this paper, we introduce involution in Γ-semigroups. Also, we define bi-Γ-ideals in Γ-semigroups with involution and prove many interesting results characterizing Γ-semigroups with involution by using bi-Γ-ideals.

DYNAMICS OF TWO-GENE ANDRECUT-KAUFFMAN SYSTEM: CHAOS AND COMPLEXITY

R. Sharma, L.M. Saha

Evolutionary dynamics of a two-gene model for chemical reactions, corresponding to gene expression and regulation, has been studied in detail. Bifurcation analysis has been carried out to understand behavior of steady state solutions leading to chaotic evolution for different cases. Numerical simulations have been performed and measurable quantities like Lyapunov exponents, topological entropies and correlation dimensions have been calculated for certain sets of parameter values. These measures explain complexity and chaotic nature of evolution.

Z_3-CONNECTED GRAPHS WITH NEIGHBORHOOD UNIONS AND MINIMUM DEGREE CONDITION

Liangchen Li, Fan Yang

Let G be a 2-edge-connected simple graph on $n \geq 15$ vertices, and let A denote an abelian group with the identity element 0. If a graph G^* is obtained by repeatedly contracting nontrivial A-connected subgraphs of G until no such a subgraph left, we say G can be A-reduced to G^*. In this paper, we prove that if for every $uv \notin E(G)$, $|N(u) \cup N(v)| + \delta(G) \geq n$, then G is not Z_3-connected if and only if G can be Z_3-reduced to one of $\{C_3, K_4, K_4^-, L\}$, where L is obtained from K_4 by adding a new vertex which is joined to two vertices of K_4. Our results extend the early theorem by Li et al. (Graphs and Combin., 29 (2013): 1891-1898).

t-PROPERTY OF METRIC SPACES AND FIXED POINT THEOREMS

T. Rashid, Q.H. Khan, H. Aydi, H. Alsamir, M. Selmi Noorani

The prime goal of this article is to prove some fixed point results in partially ordered metric spaces that are not necessarily complete. This is achieved by introducing the concept of t-property. Moreover, we have established the existence of fixed points for variant contractive mappings in the framework of incomplete ordered metric spaces. Few examples have been given to illustrate the new concepts and results.

CHARACTERIZATIONS OF MV-ALGEBRAS IN TERMS OF CUBIC SETS

Yongwei Yang, Yongzhao Wang, Xiaolong Xin

The operations of cubic sum, cubic product, cubic intersection, cubic union are given in MV-algebras, and the concepts of cubic MV-ideals and cubic prime MV-ideals in MV-algebras are introduced. Then some characterizations of cubic MV-ideals and cubic prime MV-ideals are obtained. The image set of cubic prime MV-ideals is proved to be a chain under the order relation $\preceq$ by discussing the properties of cubic prime ideals, and the cubic prime MV-ideal theory and extension theorem of MV-algebras are presented. Finally, the quotient structure of cubic MV-ideals is constructed by cubic cosets, and three isomorphism theorems concerning the quotient of cubic MV-ideals are presented by using the notion of invariant cubic sets.

A NEW VERIFIABLE MULTI-SECRET SHARING SCHEME BASED ON ELLIPTIC CURVES AND PAIRINGS

Mojtaba Bahramian, Khadijeh Eslami

In 2008, Liu, Huang, Luo and Dai, proposed a (t, n) multi-point sharing scheme by using self-pairings on the elliptic curves. The Liu's scheme is not verifiable, needs a secure channel and also there exists some restrictions in the number of secrets to be shared. In this paper we propose a new verifiable multi-secret sharing scheme which is based on that of Liu. In our scheme, there is no need to a secure channel and also there is no limit on the number of secrets. Furthermore, to identify the cheaters, the combiner can verify the secrets which have been sent by other participants during the reconstruction phase.

TRANSLATION AND DENSITY OF A BIPOLAR-VALUED FUZZY SET IN UP-ALGEBRAS

N. Udten, N. Songseang, A. Iampan

We apply the notion of bipolar fuzzy translations of a bipolar-valued fuzzy set to UP-algebras. For any bipolar-valued fuzzy set $\varphi = (A; \varphi^-, \varphi^+)$ in a UP-algebra A, the notions of bipolar fuzzy (α, β)-translations of $\varphi = (A; \varphi^-, \varphi^+)$ of type I and of type II are introduced, their basic properties are investigated and some useful examples are discussed. The notions of extensions and of intensions of a bipolar-valued fuzzy set are also studied. Moreover, we discuss the relation between the complement of a bipolar fuzzy UP-subalgebra (resp., bipolar fuzzy UP-filter, bipolar fuzzy UP-ideal and bipolar fuzzy strongly UP-ideal) and its level cuts.

P-EXPANDABLE SPACES

Heyam H. Al-Jarrah, Khalid Y. Al Zoubi

We introduce the concept of P-expandable spaces as a variation of expandable spaces. A space (X, τ) is said to be P-expandable if every locally finite collection $\mathcal{F} = \{F_\alpha : \alpha \in \Delta\}$ of subsets of X there exists a p-locally finite collection $\mathcal{G} = \{G_\alpha : \alpha \in \Delta\}$ of preopen subsets of X such that $F_\alpha \subseteq G_\alpha$ for each $\alpha \in \Delta$. We characterize P-expandable spaces and study their basic properties. We show that if a space (X, τ) is a quasi submaximal space, then (X, τ) is P-expandable if and only if it is expandable.

A COLOR IMAGE ENCRYPTION SCHEME WITH SYNCHRONOUS PERMUTATION-DIFFUSION STRUCTURE

Yuming Feng

Permutation and diffusion are two basic principles in designing an image encryption algorithm. Almost all image encryption methods are based on a scheme that separates permutation and diffusion, namely, asynchronous permutation and diffusion scheme (APDS). This paper analyses the flaws of APDS and cracks it with a chosen plaintext attack, and then proposes a synchronous permutation-diffusion scheme (SPDS). Experimental simulations and performance evaluations in key space, key sensibility, correlation coefficient, Shannon entropy, differential attack and data loss/noise attacks all show that the proposed scheme processes better performance compared with the APDS and some others, and can ensure a secure communication in practical applications.

(pp. 508–521)

INTEGRAL EQUATION FOR THE NUMBER OF INTEGER POINTS IN A CIRCLE

M.A. Chakhkiev, G.S. Sulyan, M.A. Ziroyan, N.P. Tretyakov, S.A. Mouhammad

The problem is to obtain the most accurate upper estimate for the absolute value of the difference between the number of integer points in a circle and its area (when the radius tends to infinity). In this paper we obtain an integral equation for the function expressing the dependence of the number of integer points in a circle on its radius. The kernel of the equation contains the Bessel functions of the first kind, and the equation itself is a kind of the Hankel transform.

(pp. 522–525)

A NEW CHARACTERIZATION OF SIMPLE JANKO-GROUPS

Haijing Xu, Wei Zhou, Yanxiong Yan, Guiyun Chen

It is proved that simple Janko-groups J_1, J_2, J_3 and J_4 can be determined by their order and one irreducible character degree.

(pp. 526–535)

AN ONC-CHARACTERIZATION OF A_{14} AND A_{15}

Zhongbi Wang, Liguan He, Guiyun Chen

Let G be a finite group, $o_1(G)$ denote the largest element order of G, $n_1(G)$ the number of the elements of order $o_1(G)$. Assume that G totally has r elements of order $o_1(G)$, whose centralizers have distinct orders, say, they are $c_i(G)$, $i = 1, 2, \cdots, r$. The following quantity is called the 1st $ONC-$degree of G

$$ONC_1(G) = \{o_1(G); \ n_1(G); \ c_1(G), \ c_2(G), \cdots, \ c_r(G)\},$$

denoted as $ONC_1(G)$. It has been proved that K_3-simple groups, $L_2(q)$($q = 8$, 11, 13, 17, 19, 23, 29), Mathieu simple groups, Janko Groups and alternating groups $A_n(5 \leq n \leq 13)$ can be characterized by their 1st $ONC-$degrees, but unfortunately $L_2(q)(q = 16, 25)$ cannot be characterized by the 1st $ONC-$degree. Since the $ONC-$degree of an alternating group usually contains only 3 numbers, so it is interesting to study if an alternating group can be characterized by the 1st $ONC-$degree. We shall prove that A_{14} can be characterized by the 1st $ONC-$degree, but we can not prove A_{15} does by using our approaches. We shall prove if the prime graph of G is not connected and $ONC_1(G) = ONC_1(A_{15})$, then $G \cong A_{15}$.

(pp. 536–546)

WEAKLY (I, J)-CONTINUOUS MULTIFUNCTIONS AND CONTRA (I, J)-CONTINUOUS MULTIFUNCTIONS

E. Rosas, C. Carpintero, J. Sanabria

The purpose of the present paper is to introduce, study and characterize upper and lower weakly (I, J)-continuous multifunctions and contra (I, J)-continuous multifunctions. Also, we investigate its relation with another class of continuous multifunctions.

(pp. 547–556)

A STUDY OF SECOND ORDER IMPULSIVE NEUTRAL DIFFERENTIAL EVOLUTION CONTROL SYSTEMS WITH AN INFINITE DELAY

P. Palani, T. Gunasekar, M. Angayarkanni, D. Kesavan

In this article, we study sufficient conditions for the controllability of second-order impulsive partial neutral differential evolution systems with infinite delay in Banach spaces by using the theory of cosine families of bounded linear operators and fixed point theorem.

(pp. 557–570)

θ-CLOSURE AND $T_{2\frac{1}{2}}$ SPACES VIA IDEALS

Nitakshi Goyal, Navpreet Singh Noorie

We introduce θ-closure of a set with respect to an ideal using the local closure function and obtain some properties.We also introduce θ-convergence of a filter and $T_{2\frac{1}{2}}$ spaces with respect to an ideal and by using these concepts and other separation axioms obtain the sufficient conditions for a set to be θ-closed with respect to an ideal and also obtain some characterizations of local closure function. Finally, the sufficient conditions for the equivalence of θ-closure with respect to an ideal and closure in $*$-topology are given.

ON SOME APPLICATIONS OF ALGEBRAIC HYPERSTRUCTURES FOR THE MANAGEMENT OF TEACHING AND RELATIONSHIPS IN SCHOOLS

S. Hoskova-Mayerova, A. Maturo

In terms of school context, the effectiveness of a teaching process frequently depends to a large extent on the relationship system, which had been formed within a classroom. This paper is going to present how algebraic hyperstructures can contribute significantly to understanding the system of relationships within a classroom. Furthermore, it becomes possible to assess the impact of interventions targeted at improving the system of relationships and thus to establish undisturbed and fundamental participation of students in the learning process.

ON THE NUMBER OF CYCLIC SUBGROUPS IN FINITE GROUPS

Keyan Song, Wei Zhou

It is proved that a finite group G has $|G| - 3$ cyclic subgroups if and only if $G \cong D_{10}$ or Q_8.

MULTI-FUZZY GROUP INDUCED BY MULTISETS

B.O. Onasanya, S. Hoskova-Mayerova

Multisets can be used to represent real life problems where repetition(s) of elements is necessary. Such cases occur in database query, chemical structures and computer programming but to mention a few. In this paper, some properties of algebraic sum of multisets $\uplus$ and some previous results on selection are mentioned. This work also introduces a new way to construct fuzzy sets and fuzzy groups structure on multiset.

APPLICATION OF REPRODUCING KERNEL ALGORITHM FOR SINGULAR BVPs INVOLVING FREDHOLM-VOLTERRA OPERATOR

Asad Freihat

This paper proposes asymptotically efficient algorithm for treating classes of singular boundary value problems involving Fredholm and Volterra operators associated with three-point boundary conditions. The algorithm methodology is proposed based on the novel reproducing kernel Hilbert space (RKHS) method, which is used directly without employing linearization and perturbation. The orthonormal system is generated in a favorable Hilbert space on a compact dense interval to expand the solution in Fourier series formula with accurately computable components. Numerical examples of singular multipoint BVPs are performed to support the theoretical statements that acquired by interrupting the n-term of the exact solutions. Besides, the results obtained indicate that the RK procedure is effective and competitive with a great capability in scientific and engineering applications.

NEARLY SEMI -2-ABSORBING SUBMODULES AND RELATED CONCEPTS

Haibat K. Mohammadali, Akram S. Mohammed

In this article, R is commutative ring with identity and Y is a left unitary R-module. A proper submodule L of Y is called nearly semiprime submodule if whenever $r^n y \in L$, where $r \in R$ and $y \in Y$, $n \in Z^+$, implies that $ry \in L + J(Y)$, where $J(Y)$ is the Jacobson radical of Y. This concept in courage us to introduce the concept nearly semi-2-absorbing submodule as a generalization of nearly semiprime submodule, where a proper submodule L of Y is called nearly semi-2-absorbing submodule of Y if whenever $a^2 y \in L$, where $a \in R$, $y \in Y$, implies that either $ay \in L + J(Y)$ or $a^2 \in [L : Y]$. Many basic properties, and

characterization of this concept are introduce. On the other hand the relation of this concept with other classes of modules are studied.

RING FORMS

Jan Hora

Determinant on a commutative ring of characteristics p can be extended by a linear mapping to provide a trilinear alternating form. We show some basic properties of such forms.

If the underlying ring is a chain-ring, we compute dimensions of radicals of all vectors and thus prove nonequivalence of forms arising from chain-rings with different sizes of ideals. Moreover, in the case $p = 2$ we show that all three nondegenerate forms on dimension 6 are ring forms.

DERIVED NUMBERS OF ONE VARIABLE MONOTONIC FUNCTIONS

S. Kadry, G. Alferov, G. Ivanov, A. Sharlay

The Fermat, Roll and Lagrange theorems are generalized into the class of nondifferentiable functions, the necessary and sufficient conditions for monotonicity one variable functions are given.

DERIVED NUMBERS OF ONE VARIABLE CONVEX FUNCTIONS

S. Kadry, G. Alferov, G. Ivanov, A. Sharlay

The Fermat, Roll and Lagrange theorems are generalized into the class of nondifferentiable functions, the necessary and sufficient conditions for convexity of one variable functions are given.

NONHOLONOMIC FRAMES FOR FINSLER SPACE WITH DEFORMED (α,β)-METRIC

Brijesh Kumar Tripathi

The purpose of present paper is to determine the Finsler spaces due to deformation of special (α,β)-metrics. Consequently, we determine the non-holonomic frames for Finsler space with help of Riemannian metric $\alpha = \sqrt{a_{ij}(x)y^i y^j}$, one form metric $\beta = b_i(x)y^i$ and some special Finsler (α,β)- metric.

A NOTE ON GROUPS WHOSE ALL NON-LINEAR IRREDUCIBLE CHARACTERS ARE DEFECT ZERO

Chao Qin, Guiyun Chen

Let G be a finite group, χ a non-linear irreducible character of G. $dz(\chi)$ denotes the set of all prime divisors p of $|G|$ such that χ is a $p-$defect zero character, $dz(G)$ denotes the union of $dz(\chi)$ for all non-linear irreducible characters χ of G, i.e., $\chi \in Irr(G|G')$. A finite group G such that $\bigcap_{\chi \in Irr(G|G')} dz(\chi) \neq \emptyset$ was studied in 1996. Finite groups G satisfying $dz(\chi) = \pi(\chi(1))$ for all $\chi \in Irr(G|G')$ were classified in 2007. We are motivated to study more general case, i.e., a finite group G satisfying $dz(\chi) \neq \emptyset$ for every $\chi \in Irr(G|G')$. At first, we study a solvable group G and come to a necessary and sufficient condition. Secondly, for a non-solvable group, we prove that K_3-simple groups can be uniquely determined by $dz(G)$ and the order of G.

ON TWO NEW APPROACHES IN MODULAR SPACES

Z. D. Mitrović, S. Radenović, H. Aydi, A.A. Altasan, C. ÖZel

In this paper, we prove a Reich-type fixed point theorem in modular spaces. Also, we introduce the concept of h-convex modular spaces and we get the related Banach-type theorem. Our results generalize several ones in the existing literature. Moreover, some examples are given supporting theoretical approaches.

ACCRUAL BASED AND REAL EARNING MANAGEMENT ASSOCIATION WITH DIVIDENDS POLICY "THE CASE OF JORDAN"

Mohammad Aladwan

This study aims to examine the association between earning management and dividend policy. Industrial companies listed in Amman Stock Exchange (ASE) are used as a sample for the years from 2010 to 2016. The dividend policy (DP) measured by dividends (DPO) payout ratio while earnings management (EM) measured by discretionary accruals (DAER) and real earning management (REM). Variables such as Firm size (SIZE), return on equity (ROE), financial leverage (LIV) and market to book value (MB) were also utilized as control variables. Ordinary least square was used to estimate the model built for the study and modified Cross Sectional models of this paper adopts the two modified Models of Kothari et al. (2005) and Roychowdhury model (2006). Our results show that dividend policy of a firm has a positive significant association with earnings management for. On the other hand the association between dividends policy and real earning management it has not been supported statistically.

C^*-ALGEBRA-VALUED M-METRIC SPACES AND SOME RELATED FIXED POINT RESULTS

B. Moeini, M. Asadi, H. Aydi, H. Alsamir, M.S. Noorani

In this paper, the concept of C^*-algebra-valued M-metric spaces is initiated, generalizing the M-metric spaces introduced by Asadi *et al.* [**?**]. Some fixed point theorems are also established via C_*-class functions in such spaces. Moreover, some illustrative examples are given. The obtained results generalize and improve some fixed point results in the literature.

FLUCTUATIONS OF STOCK PRICE AND REVENUE AFTER THE EARLY ADOPTION OF IFRS 15, "REVENUE FROM CONTRACTS WITH CUSTOMERS"

Mohammad Aladwan

The adoption of International Financial Reporting Standards (IFRS) around the world is gaining popularity and Jordan not being an exception. This adoption brings about improvement in accountability and quality of accounting Information through a uniform set of standards for financial reporting. The objective of this paper is to examine whether the early adoption of IFRS 15 that supersede

the International Accounting Standards (IAS) 18 concerning revenue recognition has effected Jordanian companies revenue levels and the value of stock price or not. The paper measures revenue and stock prices pre and post the IFRS 15 implementation. Two hypotheses was developed and tested at five (5) percent level of significance. The findings revealed that there is significance quantitative difference between the arithmetic means for both of revenue and stock price pre and post the standard application. Further, the results of the study provided conclusive evidence that IFRS 15 have impacted on accountability and quality of information that reported in financial statement for Jordanian mining, construction and engineering companies.

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