

DECOMPOSITIONS OF STRONG MAPS BETWEEN MATROIDS

Talal Ali Al-Hawary

Decompositions of strong maps have been studied via pre-strong, LF-strong and OFF-strong maps, see [1], [2], [3]. Our goal in this paper is to introduce several weak notions of open sets and then use them to provide new non-trivial decompositions of strong maps.

FUZZY POINTS AND FUZZY POWER GROUPS

Wenze Yang, Zhenliang Zhang

In this paper, the universe of fuzzy points on non-empty set S is defined by direct product of S and $(0, 1]$, and a fuzzy subset on S is represented by a special subset of the universe, and the binary operation of fuzzy points is induced by the one of quasi-group S . Then definitions of fuzzy group and of fuzzy power group are followed by fuzzy point product. In this way, we get a so useful tool to fuzzy algebra research that a bunch of new results is obtained in this paper. They are equal height theorem and section power group theorem of fuzzy power groups, and fuzzy equivalent member theorem of normal fuzzy power groups, and structure theorem of unique fuzzy power groups. Moreover, a common method to construct unique fuzzy power groups and two examples are given.

THE SIMPLE GROUP $L_{12}(2)$ IS CHARACTERIZABLE BY ITS ELEMENT ORDERS

M.R. Darafsheh, Y. Farjami, M. Khademi

Let $\pi_e(G)$ denote the set of orders of elements of a finite group G and let $L_{12}(2)$ denote the simple group consisting of the 12 by 12 non-singular matrices over the field with 2 elements. In this article we will prove $\pi_e(G) = \pi_e(L_{12}(2))$ if and only if $G \simeq L_{12}(2)$.

GENERALIZED COMMON FIXED POINTS BY ALTERING DISTANCES BETWEEN POINTS

K. Jha, R.P. Pant, V.P. Pande

The aim of this paper is to establish common fixed point theorems for four mappings by altering distances between the points under a Meir-Keeler type contractive condition.

AN EXACT METHOD FOR TRIANGULARIZING INPUT-OUTPUT MATRIXES

Livio C. Piccinini, Margherita Chang Ting Fa

Suppose M is a non-negative square matrix. To each permutation P of its rows and columns (the same for both) we associate the sum $S(P)$ of the cells that lie above the diagonal. By “triangularization of the matrix M ” it is meant the combinatorial problem of finding a permutation that minimizes $S(P)$. Computationally the problem is NP-hard unless the trivial case of a matrix associated to an order relation. Up to now there existed only heuristic techniques, but it was not possible to have good estimates of their goodness. The problem has a deep meaning in macroeconomics according to Leontief’s input-output theory. The new methodology presented here finds the exact (absolutely optimal) solution, joining two techniques: graph theory and integer programming. Releasing integrity condition and passing to the dual problem allows a powerful simplification through a proper analysis of intersectoral cycles. Mostly the released solution is integer, thus solving exactly the original problem; otherwise it supplies a very good upper estimate of the degree of linearity.

A NOTE ON NORMABILITY AND SEMINORMABILITY OF SOME ALGEBRAS

F. Sady, M.A. Moghaddam Zaveh

In this paper we investigate conditions for the normability of certain complete LMC-algebras and the seminormability of some operator algebras. We show that for a special class of complete LMC-algebras any submultiplicative norm is a spectral norm and there is at most one uniform norm on these algebras. The results are applied to some Fréchet algebras. On the other hand, the algebra of all continuous finite rank operators on a barreled space (X, τ) is seminormable if and only if (X, τ) is a normed space.

A PROPERTY OF THE CONNECTION BETWEEN FUZZY SETS AND HYPERGROUPOIDS

Irina Cristea

In this paper we study the connection between hypergroupoids and fuzzy sets in a particular case, when the fuzzy set $\tilde{\mu}$ associated to the hypergroupoid $H = \{a_0, a_1, \dots, a_n\}$ satisfies the ordering relation $\tilde{\mu}(a_0) < \tilde{\mu}(a_1) < \dots < \tilde{\mu}(a_n)$.

ISOMORPHISM THEOREMS ON HYPER K -ALGEBRAS

R.A. Borzooei, H. Harizavi

In this manuscript, we first define the concept of regular congruence relation on a hyper K -algebra and state and prove some related results. We also investigate the relationship between the hyper K -ideals of a hyper K -algebra and the hyper K -ideals of its quotient. After that, we state and prove the homomorphism and isomorphism theorems for hyper BCK -algebras.

ALGEBRAS DERIVED FROM SECTIONALLY INVOLUTED LATTICES

I. Chajda, P. Emanovský

It was shown in a previous paper, that a certain algebra can be derived from a bounded lattice having an antitone involution on every section. Conversely, we derive a ring-like structure convertible in the above mentioned lattice. If, moreover, the lattice is a Boolean algebra, the method yields the usual transformation to the assigned Boolean ring and vice versa. A connection to MV-algebras is also treated.

HOLDITCH-TYPE THEOREMS UNDER THE CLOSED PLANAR HOMOTHETIC MOTIONS

Salim Yüce, Nuri Kuruoğlu

In this paper, we present Holditch-Type Theorems for the orbit areas of three non-collinear points under one-parameter closed planar homothetic motions.

CONTINUITY FOR LITTLEWOOD-PALEY OPERATOR AND ITS COMMUTATOR ON HERZ TYPE HARDY SPACES

Zhou Xiaosha, Liu Lanzhe

In this paper, the continuity for Littlewood-Paley operators and its commutator on Herz type Hardy spaces are obtained.

A COMMON FIXED POINT THEOREM IN UNIFORMLY CONVEX BANACH SPACE

Sushil Sharma, Deepika Bamboria

In this paper we improve result of Rashwan by removing the condition of continuity and replacing the compatibility of mappings of type (A) by weak compatibility.

ON PARAMETRIC DOMAIN FOR ASYMPTOTIC STABILITY WITH PROBABILITY ONE OF ZERO SOLUTION OF LINEAR ITO STOCHASTIC DIFFERENTIAL EQUATIONS

Phan Thanh An, Phan Le Na, Ngo Quoc Chung

We describe a practical implementation for finding parametric domain for asymptotic stability with probability one of zero solution of linear Ito stochastic differential equations based on Korenevskij and Mitropolskij's sufficient condition and our sufficient conditions. Numerical results show that all of these sufficient conditions are crucial in the implementation.

APPROXIMATIONS TO THE TOTAL QUEUE LENGTH IN MULTIPHASE QUEUES

S. Minkevičius

Multiphase queues (tandem queues, queues in series) are of special interest both in theory and in practical applications (packet switch structures, cellular mobile networks, message switching systems, retransmission of video images, assembly lines, etc.). In this paper, we deal with approximations of multiphase queues. The author investigated multiphase queues and presents heavy traffic limit theorems for the total queue length of customers in multiphase queues in various conditions of heavy traffic.

INTERVALS OF BOOLEAN PARTIAL CLONES

L. Haddad, G.E. Simons

We describe the interval of partial clones that contain all monotonic idempotent Boolean partial functions as well as the interval of partial clones that contain all idempotent self-dual Boolean partial functions.

SOME REMARKS ON n -DIMENSIONAL LAPLACE TRANSFORMS

Jafar Saberi-Nadjafi

In 1990, Balakrishnan proves some results on two dimensional Laplace transform involved with Fourier Sine transform. In this paper we present a generalized version of the above results in n -dimensional case. In addition, some examples are also presented, which explain the useful applications of our theorem. Therefore, we have produced some n -dimensional Laplace transforms pairs.

THE POINTWISE FUZZY MAXIMAL IDEALS IN FUZZY SEMIGROUPS

Yun-qiang Yin, Fei Li, Zhen-liang Zhang

The concept of fuzzy point was introduced in the reference [1]. In this paper, the authors define the fuzzy semigroup, fuzzy ideal, fuzzy prime ideal and fuzzy maximal ideal by fuzzy point. Also, the properties of fuzzy maximal ideals are especially discussed. Finally, the conditions of a fuzzy semigroup to be a fuzzy group are given.

MODELLING OF JOIN SPACES WITH PROXIMITIES BY FIRST-ORDER LINEAR PARTIAL DIFFERENTIAL OPERATORS

Jan Chvalina, Šárka Hošková

The contribution is devoted to modelling of non-commutative join spaces with compatible proximity relation using linear partial differential operators of the first order and a certain congruence defined by means of the gradient function on suitable (non-commutative) groups of such operators. This congruence induces a certain proximity relation on a final hyperstructure compatible with corresponding hyperoperation.

ON \mathcal{I} CONVERGENT SEQUENCES OF REAL NUMBERS

Salih Aytar, Serpil Pehlivan

The concept of \mathcal{I} -convergence is a generalization of statistical convergence and it depends on the notion of the ideal \mathcal{I} of subsets of the set \mathbb{N} of positive integers. In this paper, we give \mathcal{I} analogues of some results in ordinary convergence and prove a decomposition theorem for \mathcal{I} -bounded sequences.

SOME SPECTRAL PROPERTIES OF THE LAPLACIAN MATRIX OF STARLIKE TREES

Kinkar Ch. Das

A tree is said to be starlike if exactly one of its vertices has degree greater than two. Let P_n denote the path on n vertices. By $S(n_1, n_2, \dots, n_k)$ we denote the starlike tree which has a vertex v_1 of degree $k \geq 3$ and which has the property

$$S(n_1, n_2, \dots, n_k) - v_1 = P_{n_1} \cup P_{n_2} \cup \dots \cup P_{n_k}.$$

This tree has $n_1 + n_2 + \dots + n_k + 1 = \eta$ vertices and assumed that $n_1 \geq n_2 \geq \dots \geq n_k \geq 1$. We say that the starlike tree $S(n_1, n_2, \dots, n_k)$ has k branches, the lengths of which are n_1, n_2, \dots, n_k respectively. Let λ_1 be the largest eigenvalue of the Laplacian matrix of a starlike tree $S(n_1, n_2, \dots, n_k)$. In this paper, we obtain the following upper bound for λ_1 :

$$\lambda_1 < k + 1 + \frac{1}{k-1}.$$

Let λ_2 denote the second largest eigenvalue and λ_{n-1} denote the least non-zero eigenvalue of the Laplacian matrix of a starlike tree $S(n_1, n_2, \dots, n_k)$. Also, it is shown that

$$\begin{aligned} 2 + 2 \cos\left(\frac{2\pi}{2n_k+1}\right) &\leq \lambda_2 \leq 2 + 2 \cos\left(\frac{2\pi}{2n_1+1}\right) \\ &\text{and} \\ 2 - 2 \cos\left(\frac{\pi}{2n_1+1}\right) &\leq \lambda_{\eta-1} \leq 2 - 2 \cos\left(\frac{\pi}{2n_k+1}\right). \end{aligned}$$

Moreover, we characterize the starlike trees for which the equality holds on both sides for the above two inequalities. We also compare our results to the existing results in the literature.

ON SOMEWHAT PAIRWISE FUZZY G_δ -CONTINUOUS FUNCTIONS

M.K. Uma, E. Roja, G. Balasubramanian

In this paper the concept of somewhat pairwise fuzzy G_δ -continuous functions, somewhat pairwise fuzzy G_δ -functions and weakly somewhat pairwise fuzzy G_δ functions are introduced and some interesting properties of these functions are investigated besides giving some characterizations of these functions.

ABOUT THE HYPERRING OF POLYNOMIALS

Sanja Jančić-Rašović

In this paper I analyze the hyperring of polynomials $R[[x]]$ over the commutative hyperring R , where $(R, +)$ is a hypergroup not necessarily regular. If $(R, +)$ has at least one identity, I provide a necessary and sufficient condition so that $R[x]$ is a subhyperring of $R[[x]]$. Furtheron, I show that under certain conditions, the hyperring $R[[x]]$ satisfies the theorem which is analogue to Hilbert's theorem about base.

PERIODIC SOLUTIONS OF POLYNOMIAL PLANAR NONAUTONOMOUS

Paweł Wilczyński

We present results on the existence of periodic solutions of the Riccati and Abel nonautonomous ODEs on the plane. We give sufficient conditions for the existence of one up to n periodic solutions, where n denotes the order of the polynomial on the right hand side of the equation.