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Trois anniversaires

Elena Popoviciu
(Cluj-Napoca)

1. L'année 2007? Oui, c'est une année qui nous fait souvenir de trois moments importants de la vie d'un collectif de chercheurs réunis autour d'un scientifique.

Il y a 50 ans, en 1957, le mathématicien Tiberiu Popoviciu a fondé l'Institut de Calcul de Cluj de l'Académie Roumaine. L'acte officiel de création de cet Institut est issu en mars 1957.

Il y a 40 ans, en 1967, le Séminaire Itinérant d'Équations Fonctionnelles venait de commencer son activité. Ce Séminaire de recherches que je dirige depuis sa première année d'existence, est devenu, plus tard, le Séminaire d'Équations Fonctionnelles, Approximation et Convexité.

Quelques années après la mort de l'académicien Tiberiu Popoviciu, le Séminaire a réçu l'appelation qu'il tient aujourd'hui, Le Séminaire Tiberiu Popoviciu d'Équations Fonctionnelles, Approximation et Convexité (STPEFAC).

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On L^p Norms and the Spectral Radius of Operators in Hilbert Spaces

Mira-Cristiana Anisiu (Cluj-Napoca) Valeriu Anisiu (Cluj-Napoca)

Abstract. We prove that $\lim_{p\to\infty} \|f\|_{p+1}^{p+1} / \|f\|_p^p = \|f\|_\infty$ for $f \neq 0$ in the Bochner space $L_E^\infty(\mu)$, where $(E, |\cdot|)$ is a Banach space and $(X, \mathcal{A}, \mu)$ a finite measure space. We discuss also the existence of $\lim_{n\to\infty} \left\|T^{n+1}\right\| / \|T^n\|$ for continuous linear operators T in Hilbert spaces.

Key Words: L^p norms, linear operators, spectral radius.

MSC 2000: 46E30, 47A75

1 A limit involving L^p and L^∞ norms

Let $(X, \mathcal{A}, \mu)$ be a measure space. If μ is finite and $f \in L^\infty(\mu)$, the L^∞ norm of the real function f can be obtained as the limit

$$\|f\|_\infty = \lim_{p\to\infty} \|f\|_p \,. \tag{1}$$

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Some Remarks on Collaborative Data Mining

Rodica Avram-Niţchi (Cluj-Napoca)
Ştefan Niţchi (Cluj-Napoca)

Abstract. In the last years, as results of the globalization, but also by the development of the Internet and World Wide Web, of Information Society and Knowledge Based Society, the volume of the data on the world arrived to more than 300 MB on person per year, that means at the world wide level 2-3 exabytes (10^{18} bytes), which is an unimaginable amount of data. The majority of these data are from the economic and administration fields. It is clear that it can not operate with these data volumes and that the decision makers need models extracted by these data. In this respect, a credit officer needs a model to decide if it will give or not a credit, in banking is necessary to establish if a credit card is true or false, in real estate is necessary that the price of an apartment or a house is correct or not, etc. All these are based on huge amounts of data from the databases or data warehouses of their institutions. The domain that is charged by the extract of the models from data is named "data mining".

The authors studied the problem from 1997 [Niţchi97], given different solutions. The main solutions are based on statistic methods, Naive Bayes method, clusterization, association, decision trees, etc. [Ping06] As the majority of the author from this field, the authors were oriented on the methods based on decision trees. This method is preferred by different reasons, by which we

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Almost Optimal Cubature Formulas of Gauss-type

Petru Blaga (Cluj-Napoca) Gheorghe Coman (Cluj-Napoca)

1. Let D be a domain in $\mathbb{R}^2$, $f\colon D \to \mathbb{R}$ an integrable function on D, $\Lambda(f) = \left\{\lambda_k(f) \mid k = \overline{1,N}\right\}$ a set of information on f and w a weight function on D.

One consdiers the cubature formula

$$I^{xy} f = Q^{xy}(f) + R^{xy}(f), \tag{1}$$

where

$$I^{xy} f = \iint_D w(x,y)\, f(x,y)\, dxdy,$$
$$Q^{xy}(f) = \sum_{k=1}^{N} C_k \lambda_k(f),$$

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The Problem of Existence of the n-Dimensional Directed Euler Tour of Cubic Manifold with Positive Genus

Sergiu Cataranciuc (Chişinău) Mariana Bujac (Chişinău) Petru Soltan (Chişinău)

Abstract. In the paper [$B06$] it is proved that abstract cubic n-dimensional torus [$BM06$] possesses a direct Euler tour of the same dimension. This result directs to a new (virtual) device for transmission and reception of information. In the present paper it is shown that every abstract cubic n-dimensional manifold without borders, of positive genus possesses a n-dimensional directed Euler tour. This result has a practical application.

Key Words: Abstract manifold, abstract cube, vacuum, directed Euler tour.

MSC 2000: 18F15, 32Q60, 32C10

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A Formula Related to a General Interpolation Scheme

Mircea Ivan (Cluj-Napoca) Rozica Moga (Cluj-Napoca)

Abstract. In this note we generalize a formula of Claude Brezinski in the case of a generalized interpolation scheme.

Key Words: Divided difference, generalized interpolation operator.
MSC 2000: 41A05.

1 Definitions

Interpolation, by polynomials or other functions, is a rather old method in applied mathematics. This is already indicated by the fact that the word "interpolation" itself has been introduced by John Wallis as early as 1655 in his famous work "Arithmetica infinitorum" [9].

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Punctual d-Convexity in Undirected Networks

Daniela Marian
(Cluj-Napoca)

Abstract. In this article we introduce the punctual d-convex functions on undirected networks and we study some properties of them.We adopt the definition of network as metric space introduced by Dearing and Francis (1974).

Key Words: networks, punctual d-convexity
MSC 2000: 90B10

1 Introduction

The definition of network as metric space was introduced by Dearing P.M. and Francis R.L. in 1974 in [1] and was used in [2], [4], [3], etc. We consider an undirected, connected graph $G = (W, A)$, without loops or multiple edges. To each vertex $w_i \in W = \{w_1, ..., w_n\}$ we associate a point v_i from an euclidean space X. This yields a finite subset $V = \{v_1, ..., v_n\}$ of X, called the vertex set of the network. We also associate to each edge $(w_i, w_j) \in A$ a rectifiable arc $[v_i, v_j] \subset X$ called edge of the network. We assume that any two edges have no interior common

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Trichotomy for Discrete Skew-Evolution Semiflows in Banach Spaces

Mihail Megan (Timişoara) Codruţa Stoica (Arad)

Abstract. The paper presents the property of trichotomy for skew-evolution semiflows in discrete time in Banach spaces, related to other asymptotic properties, as well as some characterizations. The provided approach is from nonuniform point of view.

Key Words: Discrete time skew-evolution semiflow, trichotomy.
MSC 2000: 34D09, 39A11

1 Preliminaries

The property of exponential trichotomy for differential systems and for linear time-varying systems described by linear difference equations has been studied in [1] and [4].

As a continuation of the study initialized in [2], we have introduced in [3] the notion of discrete time skew-evolution semiflows in Banach

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Best Uniform Approximation of a Bounded Function by Extensions of Semi-Lipschitz Functions

Costică Mustăţa
(Cluj-Napoca)

Abstract. In this Note we consider the problem of best uniform approximation of a real valued bounded function f defined on a quasi-metric space (X, d), by d-semi-Lipschitz functions. In order to obtain the existence results, some sufficient conditions are presented.

Key Words: Quasi-metric spaces, semi-Lipschitz functions, best approximations.

MSC 2000: 41A50

Let X be a nonempty set, and $d : X \times X \to [0, \infty)$ a function with the properties:

1) $d(x, y) = d(y, x) = 0$ iff $x = y$,

2) $d(x, z) \leq d(x, y) + d(y, z)$,

for all $x, y, z \in X$.

A such function d is called a **quasi-metric** on X, and the pair (X, d) is called quasi-metric space (asymmetric metric space).

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Lex-min Assignment Problem

Luciana Neamţiu (Cluj-Napoca)
Radu Lupşa (Cluj-Napoca)

Abstract. The aim of this paper is to show how the lex-min assignment problems of type cost-cost and cost-time can be solved using Kuhn's algorithm.

Key Words: assignment problem, lexicographic ordering

1 Introduction

Let us consider the lex-min assignment problem (or a lex-min transportation problem of type E):

$$(PLE) \qquad \begin{cases} f(X) = (f_1(X), f_2(X)) \to lex - min \\ X = (x_{ij}) \in \mathcal{X}, \end{cases}$$

where

$$f_1(X) = \sum_{i=1}^{n}\sum_{j=1}^{n} c_{ij}^1 x_{ij}, \ f_2(X) = \sum_{i=1}^{n}\sum_{j=1}^{n} c_{ij}^2 x_{ij}, \tag{1.1}$$

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A Class of Durrmeyer Type Operators Preserving Linear Functions

Radu Păltănea
(Braşov)

Key Words: Durrmeyer operators, approximation estimates, Voronovskaja property.
MSC 2000: 41A36, 41A35

1 Introduction

The Durrmeyer operators with Jacobi wight, $M_n^{a,b}$, $a, b > -1$, introduced in [7], act on the space of Lebesgue integrable functions. For $a = 0$ and $b = 0$ on obtain the operators, introduced independently by Durrmeyer [2] and Lupaş [5]. The operators $M_n^{a,b}$, have similar properties of approximation like the Durrmeyer-Lupaş operators. A deficiency of these operators consists in the fact that for none choice of parameters a and b, they do not preserve linear functions. However the limit operators,

$$U_n(f) = \lim_{a \to -1,\, b \to -1} M_n^{a,b}(f), \quad f \in C[a,b],\ n \in \mathbf{N}$$

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A Note on the Boundary of Radiant Sets

Nicolae Popovici
(Cluj-Napoca)

Abstract. The aim of this paper is to show that if a closed proper subset of the finite dimensional Euclidean space is radiant with respect to a convex cone having nonempty interior, then its boundary is homeomorphic to a hyperplane.

Key Words: Radiant sets, vector optimization, weakly efficient points.

MSC 2000: 90C29

1 Preliminaries

Throughout this paper $\mathbb{R}^m$ will be a finite dimensional Euclidean space with dimension $m > 1$. By a cone in $\mathbb{R}^m$ we mean any nonempty set $C \subset \mathbb{R}^m$ such that $\mathbb{R}_+ \cdot C = C$. A cone C is called pointed if $C \cap (-C) = \{0_m\}$, where 0_m stands for the origin of $\mathbb{R}^m$. It is well-known that a cone C is convex if and only if $C + C = C$. In what

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Positive Solutions of Nonlinear Systems via the Vector Version of Krasnoselskii's Fixed Point Theorem in Cones

Radu Precup
(Cluj-Napoca)

Abstract. The vector version of Krasnoselskii's fixed point theorem in cones is used to obtain existence and localization results for the Dirichlet boundary value problem associated to second order ordinary differential systems with nonlinearities having different behaviors both in components and variables.

Key Words: Positive solution, differential system, boundary value problem, fixed point, cone.

MSC 2000: 47H10, 47H07, 34B18, 34C25.

1 Introduction

In our recent paper [7], we have presented a vector version of Krasnoselskii's fixed point theorem in cones (see [1], [2], [4]) by which a solution of a system of equations has been localized in a vector conical

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Bernstein Polynomials and Hypergroups

Ioan Rasa
(Cluj-Napoca)

Abstract. We present some properties of the Bernstein polynomials of second kind.

MSC 2000: 41A36

1 Introduction

The classical (first kind) Bernstein polynomials, as well as the Bernstein polynomials of second kind, can be described in terms of random walks on hypergroups; see [4], [2], [3], [1] for details.

In this paper we shall present some properties of the Bernstein polynomials of second kind. These polynomials were introduced by P. Soardi in [4] and subsequently investigated in [2], [3].

2 Properties of the Bernstein polynomials of second kind

Let $P_n(x) = \frac{1}{\sqrt{1-x^2}} \sin((n+1)\arccos x)$, $n \geq 0$, be the Chebyshev polynomials of second kind. Denote by δ_t the unit mass at $t \in \mathbf{R}$.

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Fixed Point Theorems for Mixed Monotone Operators in Ordered Banach Spaces

Mircea Dan Rus
(Cluj-Napoca)

Abstract. We study the existence and uniqueness of the fixed points and coupled fixed points for mixed monotone operators in ordered Banach spaces. We improve some of the existing results and provide more direct proofs through the use of the Thompson's metric.

Key Words: Ordered Banach space; Normal cone; Mixed monotone operator; Coupled fixed point; Fixed point; Monotone iterative technique.

MSC 2000: 47H07, 47H10

1 Introduction

The existence and uniqueness of the fixed points for mixed monotone operators in ordered Banach spaces was first studied in the papers of D. J. Guo and V. Lakshmikantham [3], [4] and for the past twenty years their results have been improved and extended and new techniques have been developed. This extended study has proven to have not only an

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About a Procedure of Classification of Strains Belonging to the Genus Aeromonas

Brânduşa Bocoş (Cluj-Napoca)
Stefan Tigan (Cluj-Napoca)
Daniela Moga (Cluj-Napoca)

Abstract. The goal of the paper is to present a method for identification and classification of strains belonging to the genus *Aeromonas* using phenotypic characterizations based on 15 phenotypic tests.

The employed method is based on the determination of similarity and dissimilarity indices for every strain and each *Aeromonas* hybridization group. Using this method we obtained for each of the 187 *Aeromonas* strains included in study a unique hybridization group assignation.

Key Words: Aeromonas, hybridization groups, phenotypic tests, similarity index.

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L'influence des facteurs mésologiques sur la croissance et le développement des adolescents dans les derniers 15 ans en Bucarest

Cristiana Glavce (Bucarest) Dana Sandu (Bucarest) Nicoleta Milici (Bucarest)

Francoise Rovillé-Sausse (Paris)

Résumé. Dans ce travail nous avons mis en évidence les transformations morphologiques que l'on observe sur les populations des enfants et des adolescents du milieu urbain (Bucarest), dans une période de 15 ans (1990-2005). Ces modifications sont influencées par des transformations fondamentales socio-économiques qui ont une influence sur le rythme de la croissance et du développement des enfants (changement du mode de vie et du type alimentaire, les modifications dans la protection sociale et politiques médicales

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Atomic Absorption Spectrometry Determinations of some Essential (Cu,Zn, Se) and some Toxic Metals (Pb, Cd), From Urine and Blood

Cristina Horga (Cluj-Napoca) Stefan Tigan (Cluj-Napoca) Mariana Vlad (Cluj-Napoca)
Brânduşa Bocoş (Cluj-Napoca) Daniela Moga (Cluj-Napoca)

Abstract. In this study we investigated the concentrations of three essential metals (Cu, Zn, Se) and two toxic metals (Pb and Cd) in urine and blood samples collected from a heavy metals pollution exposed group of subjects (Baia-Mare), in comparison with a control group (Cluj-Napoca). Determinations were performed by atomic absorption spectrometry. All results were

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Some Statistical Procedure for Evaluation and Prediction Sexually Transmitted Infections in Transylvania

Anamaria Molnar (Cluj-Napoca)
Geza Molnar (Cluj-Napoca)
Mihaela Iancu (Cluj-Napoca)
Stefan Tigan (Cluj-Napoca)

Abstract. **Introduction**. Sexually transmitted infections are among the most common causes of illness in the world and have far-reaching health, social and economic consequences. Sexually transmitted infections are a major public health problem because: acute illness, serious sequelae and facilitation of the transmission of human immunodeficiency virus. There are two main sources of information on sexually transmitted infections: national reporting systems and epidemiological surveys. The study has proposed the evaluation of certain aspects regarding the results of surveillance of sexually transmitted

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Relationship Between Carbon Monoxide Diffusing Capacity and Other Clinic-Functional Parameters in Patients with Stable Chronic Obstructive Pulmonary Disease

Roxana Nemeş (Bucharest)
Stefan Tigan (Cluj-Napoca)
Nicoleta Bîscă (Bucharest)
Emil Corlan (Bucharest)

Abstract. The aim of the study was to investigate relationship between nutritional status (body mass index, BMI), severity of airway obstruction (FEV1), cor pulmonale chronic (cpc) and impairment of DL,co in 211 patients with stable COPD (88.6% males), age 62 ± 9 years (mean ± standard deviation), exsmoker 77% (n=164/211), underwent during 2002-2005 to: spirometry, bodypletysmography, diffusion capacity for carbon monoxide (Dl,co), electrocardiogram (ECG).

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A Computational Analysis of the Medication Targets in Type 2 Diabetes Mellitus and Metabolic Syndrome Management

Stelian Vasile Şarlea (Cluj-Napoca)
Nicoleta Georgiana Minea (Târgu Mureş)
Sergiu Constantin Batâr (Cluj-Napoca)
Ştefan Hobai (Târgu Mureş)

Abstract. The human organism is in equilibrium with the environment, this equilibrium being possible because of multiple biochemical reactions which produce the adaptation at variable external conditions. At the cellular level the adaptation needs the receptor-mediated transmission of signals generated by the changing stimulus. Mathematics and bioinformatics could be ways for understanding the physiological and pathological processes that are responsible for the good functioning of organism or, per contra, for producing several diseases.

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About Sound Pollution in Medical Facilities

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Abstract. The problems caused by noise (both auditive and non-auditive) depend not only on the sound properties (intensity, rhythm), but also on the susceptibility of the tested subjects. The evaluation of the indoor noise is important because it ensues the protection against sonic pollution in: hospital ward, operating theatre, offices, laboratories, storage areas, etc.

In this paper, we present the results of the assessment of the indoor noise that took place in the Oradea Hospital of Obstetrics and Gynaecology.

We have taken into account in our study the period between 2003 – 2005; the tests performed highlighted the following: all readings of the indoor sound recorded in this medical facility exceed the noise limit, the noise rising in the above-mentioned period with 19.12 dB; the sound pollution tends to rise both in daytime and in night time; comparing the readings obtained at the 3 measuring

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Occupational Risks in Respiratory Cancer Ethiopathogenesis

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Abstract. *Background*: Occupational cancers are defined as neoplastic proliferations caused by exposure to certain specific chemical, physical or biological agents during their professional activities. *Materials and methods*: We studied 3523 patients with respiratory cancer admitted in four clinics in Cluj-Napoca between 1991 and 2000. The study aimed to establish if there is a relation between certain exposure groups, and respiratory cancer. *Results:* Nasal cancer had the earliest onset; bronchopulmonary cancer had the highest mean age at onset. The most significant risks identified were: silica, asbestos, exposure to respiratory irritants for bronchopulmonary cancer, mixed dusts, organic dust and smoking for laryngeal cancer, nonspecific industrial exposure and smoking for oral cancer, wood dust and organic solvents for sinus cancer, nonspecific industrial exposure and farming, for nasal cancer. *Conclusions*: There is an acute need for a well-coordinated data collecting and referring system in order

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On a Multicriterial Evaluation of the Surgical Techniques for Anterior Hypospadias

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Abstract. In this work we propose a multicriterial procedure to evaluate some surgical treatments for hypospadias using the evaluations of these criteria for a group of patients. The ranking procedure of treatments is based on a set of interval weights for the considered criteria. We apply an aggregation method in order to obtain two global scores for each treatment. Finally, by this scoring method the treatment ranking could be classified in decreasing order of the two global scores.

Some alternative procedures involving statistical comparisons for obtaining partial ranking after each characteristic are proposed.

Key Words: Surgical treatment of anterior hypospadias, fistula, urethroplasty, multicriterial ranking

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