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The Academy of Romanian Scientists, Târgoviște Branch

THE FOURTEENTH CONFERENCE
ON NONLINEAR ANALYSIS AND
APPLIED MATHEMATICS

Târgoviște, June, 17, 2016

BOOK OF ABSTRACTS

Supported by a grant of the Romanian National Authority for Scientific Research, CNCS-UEFISCDI, project number PN-II-ID-PCE-2011-3-0087

ARIPA OSCILANTA - TEORIA LUI CARABINEANU

SILVIU SBURLAN

Abstract:

Studiul suprafetelor portante oscilatorii sau ondulatorii are importanta in domenii cum ar fi aeroelasticitatea, robotica, bionica, zoologia aplicata. Astfel in aeroelasticitate se studiaza fenomenul de flutter care consta in interactiunea dintre fluid, si structura elastica ce determina aparitia de vibratii auto - intretinute. De asemenea imitand mijloacele de locomotie ale animalelor acvatice sau zborul pasarilor au fost create pesti sau pasari robot a caror deplasare este determinata de forta de propulsie generata de miscarile oscilatorii sau ondulatorii ale aripilor sau ale corpului. Vom studia in cele ce urmeaza, in cadrul teoriei micilor perturbatii miscarea oscilatorie (ondulatorie) a unei aripi (suprafete portante). Teoria aripei oscilante, expusa pe larg in lucrarile [3],[4] ,si [5], o vom numi teoria lui Carabineanu, ca omagiu adus memoriei, si anvergurii stiintifice a Profesorului Adrian Carabineanu.

In memoriam

Prof. Adrian CARABINEANU, PhD (1953 – 2016)

ON THE USING OF BERGMAN'S OPERATORS IN STUDYING THE FREE SURFACE FLUID DYNAMICS

MIRCEA LUPU
GHEORGHE RADU

Abstract:

This study presents the Ciaplîghin-Iacob-Falcovici hodographic method in solving boundary problems in the case of the free surface fluid dynamics. Using Bergman's operators, a new method is being built and systematized. The properties and the convergence of the new built eigenfunctions are studied. Finally, this method is applied to determinate the current function in the case of C. Iacob's nozzle and to study transonic flows.

CONTINUOUS FUNCTION AND TOPOLOGICAL STRUCTURE OF ITS GRAPH

CORNELIU UDREA

Abstract:

The epigraph of a function plays a key role in the study of some properties of the corresponding function as the continuity or the convexity (for example concerning the real functions on the Euclidean spaces, see [5], [7] or [8]). Since the epigraph is uniquely determined by the graph of the given function it is to expected that the graph itself can offer sufficient information about the mentioned properties. This work is devoted to the description of the some properties of continuity. We present some general cases when we can characterize these properties by the topological structure of the corresponding graph.

ON THE URQUHART THEOREM

MIRON OPREA

Abstract

Malcolm Urquhart (1902-1966) was a distinguished Australian physicist who had scientific concerns regarding the elementary synthetic geometry. Thus, in 1964 he shared to his colleagues the following property of elementary geometry:

Given the figure 1.

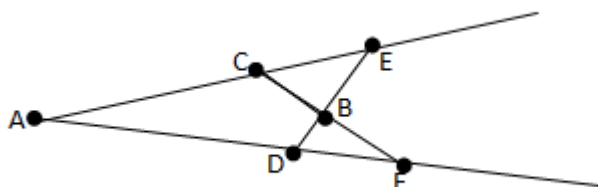


Figure 1.

There exists the following implication:

$$AC + CB = AD + DB \Rightarrow AE + EB = AF + FB$$

We can notice that the figure is similar with that linked to the Menelaus theorem in a triangle cut by a transversal. It is amazing that this implication was missed by the Greek geometers and those from the XIX century.

In this paper the author gives a simple geometric demonstration of the Urquhart implication and makes some comments on it.

A FIXED POINT METHOD TO SOLVE THE NONLINEAR COMPLEMENTARITY PROBLEM FOR A CLASS OF MONOTONE OPERATORS

DINU TEODORESCU

Abstract:

In this paper, using the classic Banach fixed point theorem, we study the nonlinear complementarity problem for a class of monotone operators in real Hilbert space.

THE CHARACTERIZATION OF SOME LINEAR MAPS USING THE RANK

VASILE POP

Abstract:

For a linear map $T : V \rightarrow V$, where V is a vectorial space, there are two special subspaces: the kernel ($\ker T$) and the image ($\text{Im} T = T(V)$) with dimensions $d(T)$ (the defect of T), respectively $r(T)$ (the rank of T). In this paper we characterize some special linear maps (projections, symmetries, threepotent maps) using only these subspaces and there dimensions.

A NOTE ON ABEL'S PARTIAL SUMMATION FORMULA

CONSTANTIN P. NICULESCU
MARIUS MARINEL STANESCU

Abstract:

Several applications of Abel's partial summation formula to the convergence of series of positive vectors are presented. For example, when the norm of the ambient ordered Banach space is associated to a strong order unit, it is shown that the convergence of the series $\sum x_n$ implies the convergence in density of the sequence (nx_n) to 0. This is done by extending the Koopman-von Neumann characterization of convergence in density. Also included is a new proof of the Jensen-Steffensen inequality based on Abel's partial summation formula and a trace analogue of Tomic-Weyl inequality of submajorization.

THE MATHEMATICAL WORK OF ALEXANDRU POPESCU ZORICA

ANDREI VERNESCU

Abstract:

In the talk we emphasize the fields of research and some of the mathematical works of Alexandru Popescu Zorica.

SOME CONSIDERATIONS ON THE DEFORMATION OF A MATERIAL SYSTEM

CONSTANTIN GHIȚĂ

Abstract: We introduce a mechanical element for an uni-dimensional material system, using the space of functions with bounded variation. A dual formulation of the quasi-static deformation problem, permit us to construct a dual algorithm for the calculus of the state parameters for deformed system. There are offered a graphical representation of elongation.

PROBABILISTIC CONTRACTIONS WITH APPLICATIONS IN THE STABILITY OF FUNCTIONAL EQUATIONS

DOREL MIHET

Abstract:

We discuss some fixed point theorems related to several classes of probabilistic contractions in connection with the Hyers - Ulam stability of functional equations.

O GENERALIZARE A UNEI PROBLEME DE LA OIM 2014

MANUELA PRAJEA

MARIUS MAINEA

Abstract:

In aceasta nota ne propunem sa prezentam o abordare inedita a 3 probleme de algebra , folosind metoda reducerii la absurd si notiuni de analiza matematica . In una din situatii vom generaliza prima problema de la a 55-a Olimpiada Internationala de Matematica din Africa de Sud 2014.

AN APPROXIMATION OF A SURFACE USING BERNSTEIN POLYNOMIALS

OCTAVIAN MIRCIA GURZĂU

VICUȚA NEAGOȘ

FLORIN POPIȘTER

Abstract:

In this paper we use Bernstein polynomials to fit a surface that is obtained from a matrix of coordinates of points. We consider the errors of the coordinates of the points and give an estimation of the error when approximate coordinates using Bernstein polynomials. We will give an example for a matrix with 483x99 points.

A NEW EPIMORPHISM OF MATRIX COALGEBRAS

GEORGIANA VELICU

Abstract. In this paper we construct a new morphism of matrix coalgebras, than we prove that it is an epimorphism and also that its kernel is a coideal in the matrix coalgebra. Finally we give a generalization on this type of morphism between two matrix coalgebras.

Keywords: coalgebra, matrix coalgebra, coideal, morphism, kernel

PREDICTING EMPLOYEES EVALUATION PERFORMANCE USING SIMULATION AND MATHEMATICAL MODELING

FLOREA NICOLETA VALENTINA

MIHAI DOINA CONSTANTA

Abstract

Any organization makes assessments to achieve improvements in employee activity or in those processes that do not bring the desired performance. If, through various methods used to determine the degree of fulfillment of performance by employees, these performances are met, then the employees should be rewarded financial or nonfinancial, and if they are not fulfilled, employees must be sent to various training programs, learning or development processes in order to improve their performance.

In this article we analyze some methods and models to assess performance and we are also present the advantages and disadvantages of their use in organizations. We have also realized a case study in an organization that uses as evaluation method, the Gauss method, showing its importance by using simulation process, and showing its benefits and disadvantages of using such a method of performance evaluation.

Key words: performance, methods of performance evaluation, mathematical modeling, Gauss method, efficiency.

APPLICATION OF THE MARKOV CHAINS IN THE TEXTILE MANUFACTURING PROCESS

ALINA CONSTANTINESCU

Abstract:

In this paper we apply the Markov chains theory to estimate the times of the textile manufacturing process.

MODELLING OF AIR POLLUTION USING SATELLITE-DERIVED OBSERVATIONS

DANIEL DUNEA , ALIN POHOATA , EMIL LUNGU , STEFANIA IORDACHE

Abstract:

One of the major air quality stressors in the urban area is particulate matter (PM). PM includes dust, dirt, soot, smoke, and liquid droplets emitted into the air by various sources such as vehicles, factories, and construction activities. PM has been linked to asthma and other respiratory illnesses. Inner-city residents need timely access to air quality synthetic indicators for protecting their respiratory health.

NOAA Hybrid Single-Particle Lagrangian Integrated Trajectory model (HYSPLIT), respectively the backward trajectory type, was used to overview the contribution of long range transport from the most probable source region of the significant episodes characterized by PM rising of concentrations.

CONTRIBUȚII LA APROXIMAREA FUNCȚIILOR GAMA ȘI A CELOR ÎNRUDITE CU ACEASTA

SORINEL DUMITRESCU
CRISTINEL MORTICI

Abstract:

Scopul lucrării este de a găsi formule de aproximare pentru funcția factorial împreună cu extensia ei - funcția gama.

METODE ȘI ALGORITMI PENTRU ESTIMAREA UNOR FUNCȚII NUMERICE

**CRISTEA VALENTIN GABRIEL
CRISTINEL MORTICI**

Abstract.

Vom prezenta estimări clasice și recente ale funcției gama și ale unor rapoarte de funcții gama. Vom prezenta estimări clasice și recente ale raportului lui Wallis și funcții complet monotone asociate raportului lui Wallis. Vom prezenta accelerarea vitezei de convergență a unor șiruri care converg la constanta Euler-Mascheroni , a benzii lor de convergență, cât și seria asimptotică asociată unui astfel de șir. Vom prezenta estimări clasice și recente ale volumului și ariei bilei unitate n-dimensionale și noi inegalități relative la volumul și aria bilei unitate n-dimensionale.

A EDUCA ÎNSEAMNĂ A IUBI. CURRICULUM CENTRAT PE COPIL

MARINA TOMA

Abstract:

Important contribution to the foundation and development of the theory curriculum has brought the Chicago School , named John Dewey " enterprise cooperation " in which " wisdom , tact and dedication of teachers produced transformation plans originating amorphous in an organization alive and moving Own . " in this school there have been changes in the syllabi and methods were used with a special emphasis on productive work and play (method of problem solving , discovery learning , work in small groups , hiking , visits , excursions , meetings with poets , historians , authors of textbooks) .

Friday – June, 17th, 2016

13:30-14:00 OPENNING CEREMONY

Talks

Chairman: CONSTANTIN P. NICULESCU

14:00-14:15 SILVIU SBURLAN, ARIPA OSCILANTA - TEORIA LUI CARABINEANU

14:15-14:30 ANDREI VERNESCU, THE MATHEMATICAL WORK OF ALEXANDRU POPESCU ZORICA

14:30-14:45 DINU TEODORESCU, A FIXED POINT METHOD TO SOLVE THE NONLINEAR COMPLEMENTARITY PROBLEM FOR A CLASS OF MONOTONE OPERATORS

14:45-15:00 VASILE POP, THE CHARACTERIZATION OF SOME LINEAR MAPS USING THE RANK

15:00-15:15 MIRCEA LUPU, GHEORGHE RADU, ON THE USING OF BERGMAN'S OPERATORS IN STUDYING THE FREE SURFACE FLUID DYNAMICS

15:15-15:30 MIRON OPREA, ON THE URQUHART THEOREM

15:30-15:45 CRISTEA VALENTIN GABRIEL, CRISTINEL MORTICI, METODE ȘI ALGORITMI PENTRU ESTIMAREA UNOR FUNCȚII NUMERICE

15:45-16:00 SORINEL DUMITRESCU, CRISTINEL MORTICI, CONTRIBUȚII LA APROXIMAREA FUNCȚIILOR GAMA ȘI A CELOR ÎNRUDITE CU ACEASTA

16:00-16:30 COFFEE BREAK

Talks

Chairman: SILVIU SBURLAN

16 :30-16:45 CONSTANTIN P. NICULESCU, MARIUS MARINEL STANESCU, A NOTE ON ABEL'S PARTIAL SUMMATION FORMULA

16:45-17:00 CORNELIU UDREA, CONTINUOUS FUNCTION AND TOPOLOGICAL STRUCTURE OF ITS GRAPH

17:00-17:15 DANIEL DUNEA, ALIN POHOATA, EMIL LUNGU, STEFANIA IORDACHE, MODELLING OF AIR POLLUTION USING SATELLITE-DERIVED OBSERVATIONS

17:15-17:30 CONSTANTIN GHIȚĂ, **SOME CONSIDERATIONS ON THE DEFORMATION OF A MATERIAL SYSTEM**

17:30-17:45 GEORGIANA VELICU, **A NEW EPIMORPHISM OF MATRIX COALGEBRAS**

17:45-18:00 FLOREA NICOLETA VALENTINA, MIHAI DOINA CONSTANTA, **PREDICTING EMPLOYEES EVALUATION PERFORMANCE USING SIMULATION AND MATHEMATICAL MODELING**

18:00-18:15 ALINA CONSTANTINESCU, **APPLICATION OF THE MARKOV CHAINS IN THE TEXTILE MANUFACTURING PROCESS**

18:15-18:30 MARINA TOMA, **A EDUCA ÎNSEAMNĂ A IUBI. CURRICULUM CENTRAT PE COPIL**

18:30-18:45 MANUELA PRAJEA, MARIUS MAINEA, **O GENERALIZARE A UNEI PROBLEME DE LA OIM 2014**

18:45-19:00 DOREL MIHET, **PROBABILISTIC CONTRACTIONS WITH APPLICATIONS IN THE STABILITY OF FUNCTIONAL EQUATIONS**

19:00-19:15 OCTAVIAN MIRCIA GURZĂU, VICUȚA NEAGOȘ, FLORIN POPIȘTER, **AN APPROXIMATION OF A SURFACE USING BERNSTEIN POLYNOMIA**