

THE THIRTEENTH CONFERENCE
ON NONLINEAR ANALYSIS AND
APPLIED MATHEMATICS

Târgoviște, June, 5, 2015

BOOK OF ABSTRACTS

THE SUBSONIC FLOW PAST AN OSCILLATORY AIRFOIL

ADRIAN CARABINEANU

Abstract: The fluid flow past an oscillatory thin airfoil may be considered potential (according to Helmholtz's theorem) excepting a vortex sheet detaching downstream from the trailing edge. The perturbations caused by the thin airfoil in the uniform at infinity upstream flow are small. Neglecting the products of the perturbations of velocity, pressure and density one may linearize the equations of aerodynamics and may express the jump of the pressure past the airfoil in terms of the solution of a hypersingular integral equation (the lifting surface equation). The great advantage of the lifting surface equation is that the domain of integration is the airfoil (more precisely its projection onto the Oxy - plane) and the influence of the vortex sheet is taken into account by means of the expression of the kernel. After solving the lifting surface equation one may calculate the aerodynamic coefficients (lift, drag and moment coefficients) and the pressure field.

SEVERAL DIVISIBILITY CRITERIA FOR PRIME NUMBERS

DAN COMA

Abstract: Considering the natural number $A=10a+b$ we want to find the smallest natural number k , prime by m so that: m divides $10k + 1$ or m divides $10k - 1$ knowing that m also divides A .

THE OPTIMIZATION OF THE INDIVIDUAL COSTS FOR A UNIVERSITY STUDIES CYCLE

ALINA CONSTANTINESCU

Abstract: In this paper we apply the theory of the Markov chains to study the individual costs of the students during of a university cycle.

ESTIMATES AND AN ASYMPTOTIC SERIES RELATED TO EULER-MASCHERONI CONSTANT

VALENTIN GABRIEL CRISTEA, CRISTINEL MORTICI

Abstract: We give some estimates and an asymptotic series for a sequence that converges to the Euler-Mascheroni constant.

SOME RESULTS ON GLOBAL SMOOTHNESS PRESERVATION BY BERNSTEIN-TYPE OPERATORS ON SIMPLEX

MARIA TALPAU DIMITRIU

Abstract: In this paper are presented results relating to the preservation of global smoothness by some Bernstein-type operators on simplex with respect to a certain modulus of continuity of order two.

CLASSICAL AND RECENT APPROXIMATIONS OF THE GAMMA FUNCTION

SORINEL DUMITRESCU, CRISTINEL MORTICI

Abstract: The aim of this paper is to present recent approximation formulas for the gamma function.

IMPROVING ORGANIZATION PERFORMANCE THROUGH HUMAN CAPITAL DEVELOPMENT USING A REGRESSION FUNCTION AND MATLAB

NICOLETA VALENTINA FLOREA
DOINA CONSTANTA MIHAI

Abstract: Due to continual change environment, employees and organizations become more willing to make known their human resources and to develop them in order to achieve competitive advantage. To cope with these changes, the organizations must invest in its employees' development and in acquiring new skills, competencies and knowledge that can influence organization's performance. In this article, we will show that continuous development helps employees and organizations to achieve their goals and that human factor is a key factor in motivating and retaining competent employees. Also, we will demonstrate that applying simulation and modeling, organizations could predict a near future by implementing performance metrics, finding the probable risks that may arise over time, and by determining the role of human capital in achieving competitive advantage. Using the simulation (multi-factorial regression function) and a computer program (MATLAB) organizations can obtain performance and improve its processes, not necessarily by increasing the number of employees, but through their development, seen not as an expense but as a long-term investment.

ABOUT A MATHEMATICAL MODEL FOR AN ANISOTROPIC HARDENING MATERIAL

CONSTANTIN GHIȚĂ

Abstract: We formulate some problems modelling the local behaviour of a plastic material with hardening following a *Prendtl-Reuss* law. Directional linear hardening, which is similar to Bauschinger's effect in metals, is characterized by an anisotropic tensor. The flow process of material is revealed by translation in the direction shown by deformation using an absolutely continuous guiding function. The possibility of choice of a plastic strain component for the mechanical system with hardening requires an algebraic factorization of the space of processes. If the quasi-static deformation is seen as a limit case of the dynamic

deformation, corresponding to low speeds and low inertial forces, we obtain an existence and uniqueness result. In this context there exist an admissible plastic strain rate and a permissible elastic stress for a sweeping process.

AN ALGORITHM FOR THE ESTIMATION OF A ZERO OF A REAL FUNCTION BASED ON BERNSTEIN POLYNOMIALS

OCTAVIAN MIRCIĂ GURZĂU

Abstract. For $f : [a, b] \rightarrow \mathbf{R}$ a monotone and convex or concave function on $[a, b]$, which has a zero x^* on this interval, we define two sequences, using Bernstein polynomials, that are convergent to x^* . We give and a few examples.

THE STUDY OF THE ELASTIC AND THERMOELASTIC EQUILIBRIUM PROBLEM FOR CYLINDRICAL TUBES WITH BIG TORSION ANGLE

MIRCEA LUPU

Abstract: In this paper, the coupled problem of the thermoelastic equilibrium for cylindrical tubes with big torsion angle is solved. The mathematical model of isotropic elastic cylinder with big torsion angle is also presented. Using the new mathematical model, we actually solve the thermoelasticity problem for cylindrical tubes.

A FUNCTIONAL INEQUALITY THAT GENERALIZES BERGSTRÖM'S AND RADON'S INEQUALITIES

DORIN MĂRGHIDANU

Abstract: In this work we present and prove a functional inequality for convex (concave) functions from which result Bergström and Radon's inequalities, through particularization, as well as other numberless inequalities, known or new.

ABOUT TWO REVERSE INEQUALITIES OF BULLEN'S INEQUALITY

NICUȘOR MINCULETE

Abstract. In this paper we prove two reverse inequalities of Bullen's inequality which represents the generalizations of results from [3]. We also present several applications about the arithmetic mean and the logarithmic mean.

ASYMPTOTIC EXPANSION FOR DURRMEYER TYPE OPERATORS

ANTONIO-JESUS LOPEZ-MORENO
AND JOS'E-MANUEL LATORRE-PALACIOS

Abstract: We consider a class of Durrmeyer type operators and we study for them the asymptotic expansions for the corresponding sequences and their derivatives. We also analyze the case of composite Durrmeyer operators and present some results for Meyer-Knig and Zeller type operators. As a consequence of the asymptotic formulas that we obtain we also present several versions of localization results for the convergence of the derivatives. We analyze both the univariate and the multivariate setting. With this work we try to extend the results of [1, 2] for Durrmeyer operators.

EINSTEIN AND THE PITHAGORA'S THEOREM

MIRON OPREA

Abstract. In his paper entitled „*Seventeen Equations that changed the world*”, published in 2013, the brilliant Scottish mathematician of Warwick, Ian Stewart, placed on the first position the Pithagora's theorem (the Pithagora's equation: $x^2 + y^2 = z^2$). This theorem created the most part of the mathematics: trigonometry, analytic geometry, relativity theory and other fields of nowadays mathematics. On the other side, little A. Einstein, at only 12 years old, gave an original proof to the Pithagora's theorem in a rectangled triangle. This theorem leads the teen-ager A. Einstein (in 1905 and 1916, respectively) to the creation of the limited and generalized relativity theory.

PARTITIONS OF THE SET OF POSITIVE INTEGERS IN TRANSLATED SETS

VASILE POP

Abstract. If $F = \{A_i \mid i \in I\}$ is a family of subsets $A_i \subset \mathbf{N}$, $i \in I$, we say that F is a translated family if there is a subset $B \subset \mathbf{N}$ and a sequence $\{a_i \mid i \in I\} \subset \mathbf{Z}$ such that $B = a_i + A_i$, $i \in I$. In this paper we study the existence of partitions of the set \mathbf{N} in translated sets.

SOME EXTENSIONS OF ERDÖS-MORDELL AND CHILD INEQUALITIES

ADRIAN STROE

Abstract: We present an inscribed quadrilateral property which generates extensions of *Erdős-Mordell* and *Child* type inequalities in triangle or convex polygon and an interesting property of centroid.

ON FIXED POINT PROPERTIES OF A CONVEX COMBINATION OF PROJECTORS

DINU TEODORESCU

Abstract: In many papers the convex combinations of projectors are studied about the convex feasibility problem, or about the image recovery. The aim of this paper is the study of fixed point properties of a convex combination of projectors.

ABOUT PROCEPT

MARINA TOMA

Abstract The procept is a new concept meaning both a process and a concept. Using it specialists in didactics tries to understand why is Mathematics so difficult to learn by some students.

A REMARK ON THE DIRICHLET PROBLEM FOR THE MONGE-AMPÈRE EQUATION

CORNELIU UDREA, MARIAN HAIDUCU

Abstract. Using the solution of the Monge-Ampère equation for a bounded Radon measure μ , and a equicontinuous criterion for a special class of convex functions we present a characterization of the existence of the solution for the Monge-Ampère equation for an arbitrary Radon measure.

GROUPS IN NATURE

GEORGIANA VELICU

Abstract: This paper presents some beautiful aspects of groups that we find in nature: the symmetry groups of plane figures and the finite rotation groups of three-dimensional figures, because we find all these symmetries in things as border ornaments and wallpaper patterns. Also, the natural connection between groups, geometry and linear algebra is the use of groups in crystallography, one of the most important applications of groups to symmetry problems in science.

NEW ESTIMATIONS FOR THE SEQUENCE OF WALLIS, BASED ON A CONVEXITY PROPERTY OF SOME INTEGRALS.

ANDREI VERNESCU

Abstract. We give some new estimation for the sequence of Wallis, based on the convexity property of some integrals.

THE NOTION OF INFLEXIONAL POINT SINCE CHRISTIAN HUYGENS UNTIL TODAY.

A.POPESCU ZORICA

Abstract: We give a sketch of the history of the notion of inflexional point.

MONOTONE SEMILINEAR EIGENVALUE PROBLEMS

SILVIU SBURLAN

Abstract: All problems in Applied Mathematics lead to abstract nonlinear equations of the type $f(x) = p$ where f is a map defined on a domain Ω in a real Banach space X and p in X is a given element. There are different methods to study this equation depending on the properties of f and X , but only in a few cases we can solve explicitly, this equation. If it is not the case, then we must answer to some qualitative questions: There exists a solution? Is unique this solution? Which are the topological properties of the set of solutions? How we can approximate a solution? etc. Suppose that Ω is a bounded domain in X . We associate to the above equation an integer $d := d(f; \Omega; p)$ in \mathbb{Z} such that $|d|$ indicates the lower bound of the number of solutions of the above equation in Ω . Of course $d(f; \Omega; p) = 0$ and the following solution property: $d \neq 0$ results that exists x in Ω such that $f(x) = p$ is true.

The paper consists in all of these questions in an abstract axiomatic setting. Sometimes we modify equivalently the given eigenvalue problem to use the convenient topological degree arguments. Some examples and applications are also appended.

MAPPING OF AIRBORNE PARTICULATE MATTER IN URBAN ENVIRONMENT

LUNGU E., POHOATA A., DUNEA D.

Abstract: - The paper presents the functional characteristics of an environmental mapping system (EMS) for presenting air quality data according to their geographic location and spatial topologies. The basic components of a web-based GIS system were presented namely, the map server, and the application interface for displaying the thematic layers in a web page. It exemplifies the developing of a map file used by the mapping server and an .html file for the web page, which displays a thematic map that interpolates at spatial scale the measurements of the airborne particulate matter in an urban agglomeration.

APPLICATIONS OF MEAN VALUE THEOREMS IN INEQUALITIES SOLVING

LEONARD GIUGIUC

Abstract: We'll show how can we reduce the study of some n-variables ,homogenous and simetrical functions at the study of a 3 degree polynomial by using Rolle's theorem.

Friday – June, 05th, 2015

13:30-14:00 OPENNING CEREMONY

Talks

SECTION 1

SECTION 2

	Chairman: MIRON OPREA	Chairman: OCTAVIAN MIRCIA GURZAU
14:00-14:15	SILVIU SBURLAN, MONOTONE SEMILINEAR EIGENVALUE PROBLEMS	OCTAVIAN MIRCIA GURZAU, AN ALGORITHM FOR THE ESTIMATION OF A ZERO OF A REAL FUNCTION BASED ON BERNSTEIN POLYNOMIALS
14:15-14:30	MIRON OPREA, EINSTEIN AND THE PITHAGORA'S THEOREM	DORIN MARGHIDANU, A FUNCTIONAL INEQUALITY THAT GENERALIZES BERGSTRÖM'S AND RADON'S INEQUALITIES
14:30-14:45	ADRIAN CARABINEANU, THE SUBSONIC FLOW PAST AN OSCILLATORY AIRFOIL	CONSTANTIN GHIȚĂ, ABOUT A MATHEMATICAL MODEL FOR AN ANISOTROPIC HARDENING MATERIAL
14:45-15:00	CORNELIU UDREA, MARIAN HAIUCU, A REMARK ON THE DIRICHLET PROBLEM FOR THE MONGE-AMPÈRE EQUATION	DAN COMA, SEVERAL DIVISIBILITY CRITERIA FOR PRIME NUMBERS
15:00-15:15	DINU TEODORESCU, ON FIXED POINT PROPERTIES OF A CONVEX COMBINATION OF PROJECTORS	ADRIAN STROE, SOME EXTENSIONS OF ERDÖS-MORDELL AND CHILD INEQUALITIES
15:15-15:30	MARIA TALPAU DIMITRIU, SOME RESULTS ON GLOBAL SMOOTHNESS PRESERVATION BY BERNSTEIN-TYPE OPERATORS ON SIMPLEX	VALENTIN GABRIEL CRISTEA, CRISTINEL MORTICI, ESTIMATES AND AN ASYMPTOTIC SERIES RELATED TO EULER-MASCHERONI CONSTANT
15:30-15:45	NICUȘOR MINCULETE, ABOUT TWO REVERSE INEQUALITIES OF BULLEN'S INEQUALITY	SORINEL DUMITRESCU, CRISTINEL MORTICI, CLASSICAL AND RECENT APPROXIMATIONS OF THE GAMMA FUNCTION
15:45-16:00	A.POPESCU ZORICA, THE NOTION OF INFLEXIONAL POINT SINCE CHRISTIAN HUYGENS UNTIL TODAY.	FLOREA NICOLETA VALENTINA, MIHAI DOINA CONSTANTA, IMPROVING ORGANIZATION PERFORMANCE THROUGH HUMAN CAPITAL DEVELOPMENT USING A REGRESSION FUNCTION AND MATLAB
16:00-16:30	CAFFEE BREAK	

	Chairman: SILVIU SBURLAN	Chairman: CONSTANTIN GHITA
16:30-16:45	VASILE POP, PARTITIONS OF THE SET OF POSITIVE INTEGERS IN TRANSLATED SETS	LEONARD GIUGIUC, APPLICATIONS OF MEAN VALUE THEOREMS IN INEQUALITIES SOLVING
16:45-17:00	MIRCEA LUPU, THE STADY OF THE ELASTIC AND THERMOELASTIC EQUILIBRIUM PROBLEM FOR CYLINDRICAL TUBES WITH BIG TORSION ANGLE	MARINA TOMA, DESPRE PROCEPT
17:00-17:15	ANDREI VERNESCU, NEW ESTIMATIONS FOR THE SEQUENCE OF WALLIS, BASED ON A CONVEXITY PROPERTY OF SOME INTEGRALS.	LUNGU E., POHOATA A., DUNEA D., MAPPING OF AIRBORNE PARTICULATE MATTER IN URBAN ENVIRONMENT
17:15-17:30	ALINA CONSTANTINESCU, THE OPTIMIZATION OF THE INDIVIDUAL COSTS FOR A UNIVERSITY STUDIES CYCLE	GEORGIANA VELICU, GROUPS IN NATURE
17:30-18:00	ANTONIO-JESUS LOPEZ-MORENO AND JOS'E-MANUEL LATORRE-PALACIOS, ASYMPTOTIC EXPANSION FOR DURRMEYER TYPE	