

**ĐẠI HỌC QUỐC GIA HÀ NỘI
TRƯỜNG ĐẠI HỌC KHOA HỌC TỰ NHIÊN**



**HỘI NGHỊ KHOA HỌC NĂM 2014
TIỂU BAN TOÁN – CƠ – TIN HỌC**

*Chương trình Hội nghị,
Tuyển tập Tóm tắt báo cáo và Danh sách Poster*

Hà Nội, 27 – 09 – 2014

HỘI NGHỊ KHOA HỌC
TRƯỜNG ĐẠI HỌC KHOA HỌC TỰ NHIÊN NĂM 2014
TIỂU BAN TOÁN – CƠ – TIN HỌC
Hà Nội, ngày 27 tháng 09 năm 2014

BAN CHƯƠNG TRÌNH:

GS. TSKH. Phạm Kỳ Anh
GS. TS. Nguyễn Hữu Dư
GS. TSKH. Nguyễn Hữu Việt Hưng
GS. TSKH. Nguyễn Văn Mậu
GS. TSKH. Đặng Hùng Thắng
PGS. TS. Phạm Chí Vĩnh
PGS. TS. Vũ Hoàng Linh
PGS. TS. Lê Minh Hà
TS. Nguyễn Thị Minh Huyền

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TS. Bùi Thanh Tú
CN. Phạm Hoàng Long

CHƯƠNG TRÌNH HỘI NGHỊ KHOA HỌC

KHOA TOÁN – CƠ – TIN HỌC

THỨ BẢY, NGÀY 27 THÁNG 09 NĂM 2014

Địa điểm: Phòng 513, Nhà T4, Trường ĐH Khoa học Tự nhiên, ĐHQG HN,
334 Nguyễn Trãi, Thanh Xuân, Hà Nội

8h00-8h30	Đăng ký đại biểu
8h30-8h45	Khai mạc: Phát biểu của Ban chủ nhiệm Khoa và đại diện Nhà trường
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8h45 - 9h10	Nguyễn Thạc Dũng (ĐH Khoa học Tự nhiên, ĐHQG HN) <i>The p-Laplacian and geometric structure of Riemannian manifolds</i>
9h10 - 9h35	Đỗ Thanh Hà (ĐH Khoa học Tự nhiên, ĐHQG HN) <i>New approach for symbol recognition using sparse representation</i>
9h35 - 10h00	Nguyễn Kiều Linh (ĐH Thái Nguyên) <i>Convex hull problem, some improvements and applications</i>
10h00 - 10h30	Nghỉ giải lao + Giới thiệu các Poster
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10h30 - 10h55	Nguyễn Xuân Nguyên (ĐH Khoa học Tự nhiên, ĐHQG HN) <i>Dynamic vibration absorber for pendulum structures</i>
10h55 - 11h20	Nguyễn Thịnh (ĐH Khoa học Tự nhiên, ĐHQG HN) <i>Abstract random linear operators on probabilistic unitary spaces</i>
11h20 - 11h45	Ngô Anh Tuấn (ĐH Khoa học Tự nhiên, ĐHQG HN) <i>On the vanishing of the Lannes-Zarati homomorphism</i>

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FIXED POINT THEOREMS OF CONTRACTIVE COMPLETELY RANDOM OPERATORS

Pham The Anh*, Dang Hung Thang**

**Faculty of Information Technology, Military Technical Academy*

***Faculty of Mathematics, Mechanics and Informatics, VNU University of Science*

Abstract: In this paper, we obtain sufficient conditions for the existence of random fixed point of contractive completely random operators and use it to solve some eigenvalue completely random equations. This is a continuation of the paper (Random Oper. Stoch. Equ. 21: 1-20, 2013) and (Vietnam J. Math. 42(2): 133-140). To further illustrate, examples of fixed point of completely random operator are constructed.

RAYLEIGH WAVES IN AN ORTHOTROPIC HALF-SPACE COATED BY A THIN ORTHOTROPIC LAYER WITH SLIDING CONTACT

Vu Thi Ngoc Anh*, Pham Chi Vinh

Faculty of Mathematics, Mechanics and Informatics, VNU University of Science

Abstract: This report is concerned with the propagation of Rayleigh waves in an orthotropic elastic half-space coated by a thin orthotropic elastic layer with sliding contact. The main aim of this research is to establish an approximate secular equation of the Rayleigh waves. By using the effective boundary condition method, authors have been obtained the explicit third-order approximate secular equations of the wave. Since explicit dispersion relations of Rayleigh waves are employed as theoretical bases for extracting the mechanical properties of the thin films from experimental data, the obtained secular equation will be useful in practical applications.

ON THE LANNES-ZARATI HOMOMORPHISM IN RANK 6

Phan Hoang Chon*, **Dong Thanh Triet**

Faculty of Mathematics, Application, Sai Gon University

Abstract: In this work, we construct the chain-level representation of the homomorphism that is constructed by Lannes and Zarati, 1987, in the lambda algebra. We show that the chain-level map is the canonical projection from the lambda algebra onto its quotient algebra, the Dyer-Lashof algebra. Using this map, we not only review the results for the Lannes-Zarati homomorphism rank 3, 4, 5, but also show that the sixth Lannes-Zarati homomorphism vanishes at the indecomposable elements of stem at most 114.

THE p -LAPLACIAN AND GEOMETRIC STRUCTURE OF RIEMANNIAN MANIFOLDS

Nguyen Thac Dung

Faculty of Mathematics, Mechanics and Informatics, VNU University of Science

Abstract: It is well-known that there are beautiful relationship between the theory of p -harmonic function, topology and geometric structure of Riemannian manifolds. In this talk, I will recall some results on this topic. Moreover, I show that if the first eigenvalue for the p -Laplacian achieves its maximal value on a Kahler manifold or a quaternionic Kahler manifold then such a manifold must be connected at infinity unless it is a topological cylinder with an explicit warped product metric. In some sense, this means we can “hear the shape of the drum”.

PARALLEL ITERATIVELY REGULARIZED GAUSS-NEWTON METHOD FOR SYSTEMS OF NONLINEAR ILL-POSED EQUATIONS

Vu Tien Dung*, Pham Ky Anh

*Faculty of Mathematics, Mechanics and Informatics, VNU University of
Science*

Abstract: In this paper we study some novel parallel and sequential hybrid methods for finding a common fixed point of a finite family of asymptotically quasi ϕ -nonexpansive mappings. The results presented here modify and extend some previous results obtained by several authors. The effectiveness of parallel methods is demonstrated by numerical experiments.

ON WHITNEY INEQUALITY FOR LOCAL ANISOTROPIC POLYNOMIAL L_p - APPROXIMATION

Nguyễn Văn Dũng

Bộ môn Toán giải tích, Khoa KHCB, Trường Đại học GTVT

Tóm tắt báo cáo: Giáo sư Đình Dũng và T. Ullrich đã chứng minh bất đẳng thức Whitney trong việc xấp xỉ bằng đa thức trong không gian $L_p(Q)$ với $p \geq 1$ và Q là hình hộp d chiều trong \mathbb{R}^d . Họ xem xét sai số trong việc xấp xỉ một hàm f trong $L_p(Q)$ bằng các đa thức đại số với bậc không quá $r_i - 1$ đối với mỗi biến x_i . GS. Đình Dũng và T. Ullrich đã chỉ ra rằng tốc độ hội tụ của sai số xấp xỉ khi cỡ của Q dần về 0 được đặc trưng bởi modul trơn hỗn hợp toàn phần cấp r của hàm f . Phương pháp chứng minh này không áp dụng được cho trường hợp $0 < p < 1$. Bằng phương pháp khác, ta chứng minh Định lý này cho trường hợp $p > 0$.

INTEGRAL MANIFOLDS FOR PARTIAL FUNCTIONAL DIFFERENTIAL EQUATIONS IN ADMISSIBLE SPACES ON A HALF-LINE

Trinh Viet Duoc

Faculty of Mathematics, Mechanics and Informatics, VNU University of Science

Abstract: I will present the existence of stable and center-stable manifolds for solutions to partial functional differential equations of the form $\dot{u}(t) = A(t)u(t) + f(t, u_t)$, $t \geq 0$, when its linear part, the family of operators $(A(t))_{t \geq 0}$, generates the evolution family $(U(t, s))_{t \geq s \geq 0}$ having an exponential dichotomy or trichotomy on the half-line and the nonlinear forcing term f satisfies the φ -Lipschitz condition, i.e., $\|f(t, u_t) - f(t, v_t)\| \leq \varphi(t) \|u_t - v_t\|_C$ where u_t, v_t belongs to $C := C([-r, 0], X)$, and $\varphi(t)$ belongs to some admissible function space on the half-line. Our main methods invoke Lyapunov-Perron methods and the use of admissible function spaces.

FORMULAS FOR THE SPEED AND SLOWNESS OF STONELEY WAVES IN BONDED ISOTROPIC ELASTIC HALF-SPACES WITH THE SAME BULK WAVE VELOCITIES

Pham Thi Ha Giang

Faculty of Mathematics, Mechanics and Informatics, VNU University of Science

Abstract: This paper is concerned with the propagation of Stoneley waves in two bonded isotropic elastic half-spaces with the same bulk wave velocities. Our main purpose is to find formulas for the wave velocity and the wave slowness. The exact formulas for them are derived using the complex function

method. The derivation of these formulas also shows that there always exists a unique Stoneley wave for the case under consideration. An approximate formula for the Stoneley wave velocity is also established employing the best approximate second-order polynomials in the interval $[0, 1]$ in the sense of least squares, of the powers of third- and fourth-order. The numerical results prove that the obtained approximate formula is a good approximation.

NEW APPROACH FOR SYMBOL RECOGNITION USING SPARSE REPRESENTATION

Do Thanh Ha

Faculty of Mathematics, Mechanics and Informatics, VNU University of Science

Abstract: In this paper, a new approach for symbol description is proposed. This method is built based on the combination of shape context of interest points and sparse representation. More specifically, a dictionary of shape context of interest point descriptors is learned. Then, based on information retrieval techniques, a vector model for each symbol is built based on its sparse representation in a visual vocabulary whose visual words are columns in the learned dictionary. The retrieval task is performed by ranking symbols based on similarity between vector models. The evaluation of proposed method, using some datasets, demonstrates its validity and shows that it outperforms related state-of-the art methods.

PARALLEL AND SEQUENTIAL HYBRID METHODS FOR A FINITE
FAMILY OF ASYMPTOTICALLY QUASI ϕ - NONEXPANSIVE
MAPPINGS

Dang Van Hieu*, Pham Ky Anh

Center for High Performance Computing, VNU University of Science

Abstract: In this paper we study some novel parallel and sequential hybrid methods for finding a common fixed point of a finite family of asymptotically quasi ϕ -nonexpansive mappings. The results presented here modify and extend some previous results obtained by several authors. The effectiveness of parallel methods is demonstrated by numerical experiments.

NONLINEAR RANDOM VIBRATION ANALYSIS OF A BEAM
CARRYING A CONCENTRATED MASS USING THE DUAL CRITERION
OF EQUIVALENT LINEARIZATION METHOD

Nguyen Nhu Hieu*, Nguyen Dong Anh

Institute of Mechanics, Vietnam Academy of Science and Technology

Abstract: In this study, vibrations of a nonlinear beam carrying a concentrated mass and subjected to a random load are investigated using the dual criterion of stochastic linearization. Based on the standard Galerkin procedure, the governing equation of the beam is discretized to obtain the form of a Duffing-like equation corresponding to the first modal vibration. The obtained results show that, when the nonlinear parameter is increasing, the method of dual criterion is more accurate than that of the conventional linearization in comparison with exact solutions obtained from the Fokker-Planck equation method.

POST-BUCKLING BEHAVIOR OF ECCENTRICALLY STIFFENED FGM
CIRCULAR CYLINDRICAL SHELLS REINFORCED BY FGM STIFFENERS
IN THERMAL ENVIRONMENT

Le Kha Hoa*, Dao Van Dung**

**Faculty of Basic Science, Institute of Logistics*

***Faculty of Mathematics, Mechanics, Information; VNU University of
Science*

Abstract: In this paper, the problems on nonlinear buckling and post-buckling of stiffened thin circular cylindrical shells made of functionally graded material (FGM) under axial loading on elastic foundation and in thermal environment are investigated by the analytical approach. The shells are reinforced by rings and stringers in which material properties of shell and stiffeners are graded continuously in the thickness direction according to a volume fraction power-law distribution. The thermal elements of shell and stiffeners are considered. The formulations are based on the classical shell theory with Pasternak type elastic foundation and with the geometrical nonlinearity in von Karman sense, and smeared stiffeners technique. By applying Galerkin method with three-term solution of deflection, the explicit expression to find critical load and post-buckling load-deflection curves are obtained. Effects of temperature, elastic foundation, stiffeners and material and geometrical properties are analyzed.

ON EXISTENCE OF WEAK SOLUTIONS FOR A p -LAPLACIAN SYSTEM
AT RESONANCE

Bui Quoc Hung

Faculty of Information Technology, Military Technical Academy

Abstract: This article shows the existence of weak solutions of a resonance problem for uniformly p -Laplacian system in a bounded domain in

\mathbb{R}^N . Our arguments are based on the Saddle Point Theorem (P. H. Rabinowitz) and rely on a generalization of the Landesman-Lazer type condition.

ON THE STEENROD LENGTH OF REAL PROJECTIVE SPACES - A COMBINATORIAL APPROACH

Nguyen Duc Khanh

*Faculty of Mathematics, Mechanics and Informatics, VNU University of
Science*

Abstract: We consider a problem in homotopy theory: The Steenrod length of real projective space. It can be understood in the language of enumerative combinatorics by Christensen (in *Ideals in Triangulated Categories: Phantoms, Ghosts and Skeleta*, Ph.D. Thesis, MIT, Cambridge, MA). The answer for this problem is important in algebra topology. We will introduce new results for this problem.

ON REES ALGEBRAS OF LINEARLY PRESENTED IDEALS

Nguyen Phu Hoang Lan

*Faculty of Mathematics, Mechanics and Informatics, VNU University of
Science*

Abstract: Let I be a height two perfect ideal with a linear presentation matrix in a polynomial ring $R = k[x_1, \dots, x_d]$. Assume that $\mu(I) = d + 1$ and I satisfies the Artin-Nagata condition G_{d-1} . We determine the defining ideal of the Rees algebra $R(I)$ explicitly and we show that $R(I)$ is Cohen-Macaulay.

PHƯƠNG TRÌNH SAI PHÂN ẨN TUYẾN TÍNH CHỈ SỐ 1 THEO CHIỀU TIẾN VÀ LÙI

Phạm Thị Linh

*Khoa Toán - Cơ - Tin học, Trường Đại học Khoa học Tự nhiên, ĐHQG
Hà Nội*

Tóm tắt báo cáo: Báo cáo nghiên cứu về các tính chất và đưa ra nghiệm đúng của phương trình sai phân ẩn tuyến tính chỉ số 1: $A_n x_{n+1} = B_n x_n + q_n$, với chỉ số n chạy trên tập số nguyên. Từ đó tìm ra điều kiện với ban đầu với x_0 thỏa mãn là nghiệm của phương trình theo cả chiều tiến ($n \geq 0$) và chiều lùi ($n < 0$).

CONVEX HULL PROBLEM, SOME IMPROVEMENTS AND APPLICATIONS

Nguyen Kieu Linh*, Phan Thành An, Hoàng Nam Dũng***, Đinh
Thanh Giang**

**College of Science, University of Thai Nguyen*

***Institute of Mathematics Hanoi*

****Faculty of Mathematics, Mechanics and Informatics, VNU University
of Science*

Abstract:

1. Introduce the convex hull problem

Defining the convex hull problem, Applications of convex hull problem,
Some convex hull algorithms.

2. Research statement

a. Improve and/or find new algorithms determining the convex hull of a finite set of points in two-dimensional space, test input data of larger size.

b. Improve available algorithms to and the convex hull in three dimensional space, develop and construct new convex hull algorithms that can be applied in higher dimensional spaces.

c. Evaluate the algorithms in the sense of smoothed analysis which is combination of two evaluations in the average case and in the worst case.

d. Applications of convex hull problem

+ Solving some other geometric problems using convex hull algorithms.

+ Find and solve real-life application problems that are accompanied by data.

3. New results

a. Improve the convex hull algorithm in 2- and 3- dimensions

+ In R^2 , Improve Quickhull algorithm and the algorithm after improving reduces the computation time of the original one by a factor of three in average.

+ In R^3 , Improve Gift-wrapping and the algorithm after improving reduces the computation time of the original one by a factor of seven in average.

b. Applications

+ Apply the new Quickhull algorithm to solve a location problem

+ Apply the new Gift-wrapping algorithm to compute the Delaunay triangulation and Voronoi diagram with input data which are created randomly on a sphere.

4. Improve Gift-wrapping algorithm

We introduce the method to improve the Gift-wrapping algorithm in three dimensions.

PHÂN TÍCH CÚ PHÁP PHỤ THUỘC TIẾNG VIỆT

Nguyễn Thị Lương*, Lê Hồng Phương**

**Khoa Công nghệ thông tin, Trường Đại học Đà Lạt*

***Khoa Toán - Cơ - Tin học, Trường Đại học Khoa học Tự nhiên*

Tóm tắt báo cáo: Bài báo giới thiệu tổng quan về tình hình nghiên cứu phân tích cú pháp nói chung và trong tiếng Việt nói riêng. Từ đó xây dựng bộ nhãn phụ thuộc và kho ngữ liệu cú pháp phụ thuộc cho tiếng Việt. Triển khai thử nghiệm trên các hệ thống có sẵn và đề xuất phương pháp mới.

BIẾN ĐỔI TÍCH PHÂN VỚI NHÂN HARLEY MỞ RỘNG

Lại Tiên Minh*, Nguyễn Minh Tuấn**

**Khoa Tọa độ địa lý, Trường Đại học Kiến trúc Hà Nội*

***Trường Đại học Giáo dục, ĐHQG Hà Nội*

Tóm tắt báo cáo: Đưa ra phép biến đổi tích phân với nhân Harley mở rộng dạng $\cos(xy+x+y) = \cos(xy+x+y) + \sin(xy+x+y)$. Tìm được hàm riêng, biến đổi ngược, xây dựng được một số chap cho phép biến đổi này.

RESEARCH ON NONLINEAR POSTBUCKLING OF AXIALLY LOADED
STIFFENED TOROIDAL SHELL SEGMENTS COATED BY FGM LAYERS
AND SURROUNDED BY AN ELASTIC FOUNDATION

Vu Hoai Nam*, Dao Van Dung, Dao Huy Bich****

**University of Technology, Transportation*

***Faculty of Mathematics, Mechanics and Informatics, VNU
University of Science*

Abstract: This paper presents an analytical approach to investigate the nonlinear postbuckling of stiffened toroidal shell segments coated by functionally graded layers and subjected to axial loads. Based on the classical thin shell theory with the geometrical nonlinearity in von Kármán sense, Stein and McElman assumption, the smeared stiffeners technique and Pasternak's two-parameter elastic foundation, the governing equations of stiffened shell segment are derived. The coated toroidal shell segments are reinforced by metal ring and stringer stiffeners. The resulting equations are solved by the Galerkin method to obtain the explicit expression of critical buckling load, postbuckling load-deflection curve. Effects of foundation, stiffener, geometrical and material parameters on the nonlinear buckling behavior of shells are shown in numerical results.

**DÁNG ĐIỀU TIỆM CẬN VÀ TÍNH ỔN ĐỊNH CỦA NGHIỆM CỦA
PHƯƠNG TRÌNH SAI PHÂN ẨN TUYẾN TÍNH CHỈ SỐ 1**

Ngô Thị Thanh Nga

Khoa Toán tin ứng dụng, Trường đại học Thăng Long

Tóm tắt báo cáo: Trong báo cáo này chúng tôi đưa ra một số định lý về dáng điều tiệm cận và tính ổn định của nghiệm của phương trình sai phân ẩn tuyến tính chỉ số 1. Ở trường hợp hệ số hằng, chúng tôi đã xây dựng các định lý cho cả tình huống nhiều tuyến tính bên phải và nhiều tuyến tính cả hai bên

(tuy nhiên nhiều bên trái cần có cấu trúc đặc biệt). Trường hợp hệ số biến thiên, kết quả chúng tôi đạt được đang dừng lại ở việc đưa ra được một số định lý về tính ổn định đều và ổn định mũ đều cho trường hợp nhiều tuyến tính bên phải.

RESEARCH ON ECCENTRICALLY STIFFENED FGM PLATES UNDER MECHANICAL AND THERMAL LOADS BASED ON FSDT

Nguyen Thi Nga*, Dao Van Dung

Faculty of Mathematics, Mechanics and Informatics, VNU University of Science

Abstract: The buckling and post-buckling behaviors of eccentrically stiffened FGM plates on elastic foundations subjected to in-plane compressive loads or thermal loads are investigated by analytical approach. The novelty of this work is that the temperature, stiffener, foundation are taking into account and the first-order shear deformation plate theory is used. The analytical expressions to determine the static critical buckling load and analyze the post-buckling load-deflection are obtained. Numerical results show the effect of temperature, stiffener, volume fraction index, elastic foundations on the buckling response of plates. The results in comparisons between the classical plate theory (CPT) and the first order shear deformation theory (FSDT) also are carried out and shown that the buckling and post-buckling behavior of more thick plate must be studied by FSDT.

DYNAMIC VIBRATION ABSORBER FOR PENDULUM STRUCTURES

Nguyen Xuan Nguyen*, **La Duc Viet****

**Faculty of Mathematics, Mechanics and Informatics, VNU University of Science*

***Institute of Mechanics, Vietnam Academy of Science and Technology*

Abstract: This report deals with the optimization problem of dynamic vibration absorber for pendulum structures. In the case of passive control, four configurations of dynamic vibration absorber are presented. In the case of semi-active passive control, the authors suggest a new control law for on-off damping device. Numerical simulations have been done to verify the effectiveness of obtained results.

SECOND-ORDER NECESSARY OPTIMALITY CONDITIONS FOR A CLASS OF SEMILINEAR ELLIPTIC OPTIMAL CONTROL PROBLEM WITH SOME TYPES OF POINTWISE CONSTRAINTS

Vu Huu Nhu

Faculty of Information Technology, National Institute of Education Management

Abstract: In this report, we present some results on second-order necessary optimality conditions for a class of semilinear elliptic problem with some types of pointwise constraints. To obtain these results this, we first derive the first- and second-order necessary optimality conditions for an abstract optimal control problem and then apply the obtained results for a class of semilinear elliptic optimal control problem with pointwise constraints. The results presented in this report have been proved in [1] and [2].

References

[1] B. T. Kien and V. H. Nhu, *Second-order necessary optimality conditions for a class of semilinear elliptic optimal control problems with mixed pointwise constraints*, SIAM J. Control and Optim., 52(2014), 1166-1202.

[2] B. T. Kien, V. H. Nhu and A. Rösch, *Second-order necessary optimality conditions for a class of optimal control problems governed by partial differential equations with pure state constraints*, J. Optim. Theory Appl., DOI 10.1007/s10957-014-0628-1

[3] B. T. Kien, V. H. Nhu, M. M. Wong and J.-C. Yao, *Necessary optimality conditions for a class of semilinear elliptic optimal control problems with pure state constraints and mixed pointwise constraints*, submitted.

NEW COMPOSITION OF INTUITIONISTIC FUZZY RELATIONS

Pham Hong Phong*, **Bui Cong Cuong**

Faculty of Information Technology, National University of Civil Engineering

Abstract: Fuzzy relations have applications in fields such as psychology, medicine, economics, and sociology. Burillo and Bustince introduced the concepts of intuitionistic fuzzy relation and a composition of intuitionistic fuzzy relations using four triangular norms or conorms α , β , λ , ρ (we abbreviate to α , β , λ , ρ -composition). In this paper, we define a new composition of intuitionistic fuzzy relations using two intuitionistic fuzzy triangular norms or intuitionistic fuzzy triangular conorms (Φ , Ψ -composition for short). It is shown that α , β , λ , ρ -composition is special case of Φ , Ψ -composition. Many properties of Φ , Ψ -composition are stated and proved.

GENERALIZED RANDOM SPECTRAL MEASURES

Tran Xuan Quy*, **Dang Hung Thang****, **Nguyen Thinh****

**Department of Mathematics - Informatics, College of Science,
University of Thai Nguyen*

***Faculty of Mathematics, Mechanics and Informatics, VNU University
of Science*

Abstract: In an attempt to examine the random version of the spectral theorem, the notion of random spectral measures and generalized random spectral measures are introduced and investigated. It is show that each generalized random spectral measure on \mathbf{C} , $\mathbf{B}(\mathbf{C})$ admits a modification which is a random spectral measure.

CONVERGENCE FOR MARTINGALE SEQUENCES OF RANDOM BOUNDED OPERATORS

Ta Cong Son*, **Dang Hung Thang**

*Faculty of Mathematics, Mechanics and Informatics, VNU University of
Science*

Abstract: In this report, we introduce and establish for infinite product of random operators taking values in a separable Banach space. In section 1, we establish convergent of sequence of extensions for random bounded operators to the convergence of sequence of last random operators. Section 2, we establish for the convergence of sequence of extensions and of sequence of martingale random bounded operators. Section 3, we devotes to define the product of random bounded operators and provide the conditions for infinite product of martingale difference of random bounded operators are convergent.

THE NUMERICAL SOLUTION NON-HYDROSTATIC SHALLOW-WATER EQUATIONS AND SOME COMPARISON RESULTS WITH PHYSICAL EXPERIMENT AND TRADITIONAL SHALLOW-WATER EQUATIONS

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** Hanoi University of Natural Resources and Environment*

*** Research Institute for the Management of Seas and Islands*

**** Hanoi University of Mining and Geology*

Abstract: The nonlinear shallow water equations apply many of the models long wave such as tides, tsunamis or storm surges. In the report refers to the use of new shallow - water equations - the non-hydrostatic shallow water equations. The numerical solution of equations is performed in two main steps: Hydrostatic and non-hydrostatic. The solution to hydrostatic problem is used to explicit difference method; non-hydrostatic problem is implicit difference method. The numerical model is applied to calculate the physical conditions of the experiment in order to compare the simulation results with experimental data to assess the ability of the model calculations. The calculated results showed that the model based on the non-hydrostatic shallow - water equations had the good capability in the simulation of long waves for the selected experimental condition, and gave better results than that simulated using the traditional hydrostatic shallow water equations.

Keywords: non-hydrostatic shallow - water equations, tides, long wave

FULL-ORDER OBSERVER DESIGN FOR NONLINEAR COMPLEX
LARGE-SCALE SYSTEMS WITH UNKNOWN TIME-VARYING DELAYED
INTERACTIONS

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** Department of Mathematics, University of Mining and Geology,
Hanoi, Vietnam*

***Department of Control and Optimization, Institute of Mathematics*

****Faculty of Science, Deakin University, AU*

Abstract: This article is concerned with the problem of state observer for complex large-scale systems with unknown time varying delayed interactions. The class of large-scale interconnected systems under consideration is subjected to interval time-varying delays and nonlinear perturbations. By introducing a set of argumented Lyapunov–Krasovskii functionals and using a new bounding estimation technique, novel delay-dependent conditions for existence of state observers with guaranteed exponential stability are derived in terms of linear matrix inequalities (LMIs). In our design approach, the set of full-order Luenberger-type state observers are systematically derived via the use of an efficient LMI-based algorithm. Numerical examples are given to illustrate the effectiveness of the result.

FIXED POINT SCHEMES EXTENDED TO EQUILIBRIUM PROBLEMS AND NONEXPANSIVE MAPPINGS

Do Duy Thanh*, **Pham Ngoc Anh****, **Pham Ky Anh*****

**Hai Phong University*

***Department of Scientific Fundamentals, Posts and
Telecommunications Institute of Technology, Hanoi, Vietnam*

****Faculty of Mathematics, Mechanics and Informatics, VNU University
of Science*

Abstract: In this paper, we propose an iteration scheme for finding a common element of the solution set of equilibrium problems and the set of fixed points of a nonexpansive mapping in a real Hilbert space. Based on the assumption on the pseudomonotonicity of the bifunction associated with the equilibrium problems, the weak convergence of the scheme is established. As an application, we introduce a computational example.

TWO NEW CONVOLUTIONS FOR THE FRACTIONAL FOURIER TRANSFORM

Pham Thi Thao

University of Hanoi Architecture

Abstract: Despite the great advances which have been recently made in the theory and applications of fractional Fourier transforms, there remains much to be worked out in their associated notions and theory. In this work, we would like to propose new convolutions which have powerful properties when associated with the fractional Fourier transform here considered. Namely, we will prove the convolution theorems associated with the FRFT, together with their natural algebraic properties such as commutativity, associativity and distributivity.

ABSTRACT RANDOM LINEAR OPERATORS ON PROBABILISTIC UNITARY SPACES

Nguyen Thinh

Faculty of Mathematics, Mechanics and Informatics, VNU University of Science

Abstract: In this paper, we are concerned with abstract random linear operators on probabilistic unitary spaces. The presentation theorem for abstract random bounded linear operators and some results on the adjoint of abstract random linear operators are given. This work is a continuation of [25].

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ỨNG DỤNG PHÂN CỤM MỜ VÀ LUẬT MỜ VIỄN CẢNH CHO BÀI TOÁN DỰ BÁO CHỨNG KHOÁN

Phạm Huy Thông*, Nguyễn Hữu Điển, Lê Hoàng Sơn, Nguyễn Duy Linh

Trung tâm Tính toán Hiệu năng cao, Trường ĐH Khoa học Tự nhiên

Tóm tắt báo cáo: Báo cáo trình bày một phương pháp tiếp cận mới cho bài toán dự báo chứng khoán dựa trên phân cụm mờ và luật mờ viễn cảnh. Trước tiên, dữ liệu được phân cụm dựa trên tập thuật toán phân cụm mờ viễn cảnh và từ các cụm này, chúng tôi tiến hành xây dựng luật mờ viễn cảnh. Cuối cùng, các giá trị dự báo được xác định từ các luật mờ viễn cảnh và được áp dụng cho bài toán dự báo chỉ số chứng khoán TAIEX của Đài Loan. Kết quả thực nghiệm cho thấy thuật toán đề xuất cho kết quả dự báo tốt hơn so với một số thuật toán liên quan.

NUMERICAL SIMULATION OF VENTILATION PROBLEM

Nguyen Thi Thuy*, Tran Van Tran

Faculty of Mathematics, Mechanics and Informatics, VNU University of Science

Abstract: The problem of two-dimensional space ventilation has the heat source inside is solved by the finite element method. Numerical simulation was conducted for a number of cases arranged outlet in different positions and have different areas, in order to compare the effectiveness of ventilation in those case base on criteria the heat flow is removed at the outlet is greatest.

MULTI-OBJECTIVE OPTIMIZATION FOR THE SENSOR PLACEMENT PROBLEM IN 3D ENVIRONMENTS

Nguyen Thi Tam*, Le Trong Vinh, Le Hoang Son

Faculty of Mathematics, Mechanics and Informatics, VNU University of Science

Abstract: In this paper, we propose a novel 3D sensing model and some variants for the multi-objective sensor placement optimization problem under three dimensional environments. These models take into account the angles of a sensor, the distance between the sensor and a given point in the terrain, the Line-of-Sight (visibility) capability, the terrains constraints and the number of sensors needed to maximize the coverage over the terrain. In order to generate optimal solutions of these models, we firstly present a novel Line-of-Sight (LoS) method aiming to determine the number of obstacles between a given sensor and a point in the region of interest using the ideas of adaptive lengths and linear regression. Secondly, we propose a Voronoi based PSO algorithm using the ideas of Particle Swarm Optimization (PSO) and the Voronoi diagram to determine the optimal solutions. The comparison and analyses of experimental results reveal that optimal solutions achieved from the 3D sensing models are better than those of the relevant works

ALGEBRAIC AND TOPOLOGICAL STRUCTURE OF WEIGHTED HOLOMORPHIC SPACES

Pham Trong Tien

*Faculty of Mathematics, Mechanics and Informatics, VNU University of
Science*

Abstract: Weighted spaces of continuous and holomorphic functions were intensively studied in many papers since the 80s and have important applications in functional analysis, complex analysis, partial differential and convolution equations. While for weighted spaces of continuous functions almost all problems have been solved, in holomorphic case the situation is much more complicated and several important questions have remained open until now. In this work we are interested in some unproved problems for spaces of holomorphic functions. Mainly, we will consider topological consequences of algebraic structure and equivalence between topological and algebraic properties of weighted holomorphic spaces.

DISCRETE ISOPERIMETRIC PROBLEM IN A SECTOR

Dang Anh Tuan

*Faculty of Mathematics, Mechanics and Informatics, VNU University of
Science*

Abstract: As we know the origin of isoperimetric problem is the problem confronted by Queen Dido. The problem was to find the shape of the boundary that should be laid down to enclose maximum area. If one assumes a straight coastline, the answer is semicircle. Some years ago, my colleague Ninh Van Thu told me Polya's question: what happens if the coastline is not straight, the region lies in a sector, and the two ends of the boundary lie on the two sides of the sector? In order to solve this problem I use the approximation method, i.e. considering the boundary is a piecewise-linear. By this approach I get some interesting discrete inequalities. My representation will give some essential arguments which I get the discrete isoperimetric inequalities.

THE RING GENERATED BY THE ELEMENTS OF DEGREE 2 IN
 $H^*(U_n(F_p), \mathbb{Z})$

Vo Thanh Tung

Duy Tan University

Abstract: The ring denote by $G = U_n(F_p)$ the p -Sylow subgroup of a general linear group $GL_n(F_p)$. We will investigate the kernel of the inflation map $\text{inf}_{G/[G,G]}^G$ in mod- p cohomology of G . This result is applied to describe the ring generated by the elements of degree 2 in integral cohomology of G for arbitrary prime number p .

ON THE VANISHING OF THE LANNES-ZARATI HOMOMORPHISM

Ngo Anh Tuan*, Nguyen Huu Viet Hung, Vo Thi Nhu Quynh

Faculty of Mathematics, Mechanics and Informatics, VNU University of Science

Abstract: The conjecture on spherical classes states that the Hopf invariant one and the Kervaire invariant one classes are the only elements in $H_*(\mathbb{Q}_0S^0)$ belonging to the image of the Hurewicz homomorphism. The Lannes-Zarati homomorphism is a map that corresponds to an associated graded (with a certain filtration) of the Hurewicz map. The algebraic version of the conjecture predicts that the s -th Lannes-Zarati homomorphism vanishes in any positive stems for $s > 2$. We prove the conjecture for the fifth Lannes-Zarati homomorphism.

MIX-LEVEL SCREENING DESIGNS CONSTRUCTED FROM DEFINITIVE SCREENING DESIGNS

Pham Dinh Tung*, Nguyen Ky Nam**

Faculty of Mathematics, Mechanics and Informatics, VNU University of Science

***Vietnam Institute for Advanced Study in Mathematics*

Abstract: Screening designs help identifying the important factors among all input factors. Screening designs are either designs with 2-level factors such as factorial or fractional factorial designs or designs with 3-level factors such as definitive screening designs or DSDs (Jones and Nachtsheim, 2011; Xiao et al., 2012; Nguyen and Stylianou, 2013). This talk reviews the mix-level screening designs using DSDs of Jones and Nachtsheim (2013) and Yang et al (2014) and introduces a new method of constructing D-efficient DSD-based mix-level screening designs.

STRONGLY REGULAR GRAPHS OF ORDER $N=7(2p+1)$, WHERE $2p+1$ IS A PRIME NUMBER

Do Minh Tuan

Department of Natural Sciences, Nam Dinh Teacher Training College

Abstract: We say that a regular graph G of order n and degree $r \geq 1$ (which is not the complete graph) is strongly regular if there exist non-negative integers τ and θ such that $|N(u) \cap N(v)| = \tau$ for any two adjacent vertices u and v , and $|N(u) \cap N(v)| = \theta$ for any two distinct non-adjacent vertices u and v , where $N(u)$ denotes the neighborhood of the vertex u . We here describe the parameters n, r, τ, θ for strongly regular graphs of order $7(2p+1)$, where $2p+1$ is a prime number.

RUNGE KUTTA METHODS WITHOUT ORDER REDUCTION FOR THE STRANGENESS-FREE DAES

Nguyen Duy Truong*, Vu Hoang Linh**

**Tran Quoc Tuan University*

***Faculty of Mathematics, Mechanics and Informatics, VNU University of Science*

Abstract: The numerical integration methods for nonlinear differential-algebraic equations (DAEs) of strangeness-free form are investigated. In particular, Runge Kutta methods, linear Multi-step methods, One-leg methods are proposed and analyzed. It showed that the consistent order of the method usually reduces when we apply directly the Runge Kutta method to the DAEs of strangeness-free form. In this paper, we will promote a new mode to construct the Runge Kutta methods without order reduction (RK-WOR) for the DAEs of strangeness-free form.

ON THE TRANSFER BETWEEN THE DICKSON ALGEBRAS AS MODULES OVER THE STEENROD ALGEBRA

Luu Xuan Truong*, Vo Thi Nhu Quynh

Faculty of Mathematics, Mechanics and Informatics, VNU University of Science

Abstract: We study the transfer between the Dickson algebras $\text{tr}_{m,n} : D_m \rightarrow D_n$ which is defined by N. H. V. Hung. We determine $\text{tr}_{1,n}$ and the image of $\text{tr}_{m,n}$ on some powers of multilinear and alternating invariants. Then, we recognize some families of invariants in D_m on which the transfer $\text{tr}_{m,n}$ vanishes.

THE IMPROVEMENT OF THE MESHLESS METHOD RBIEM FOR SOLVING THE NAVIER-STOKES EQUATION

Nguyen Van Vinh

Faculty of Mathematics, Mechanics and Informatics, VNU University of Science

Abstract: This work presents the improvement of the meshless method RBIEM (Radial Basis Integral Equation Method) for solving the Navier-Stokes equation in 2D. In the older version of RBIEM, the integral on the boundary of each sub-domain is discretized into linear or quadratic elements and then the boundary integral coefficients are calculated on each element. This report shows the improvement of RBIEM which does not require discretization process. The integrals are calculated directly on each circular sub-domain by using polar parameter. The analytical formulae to calculate the boundary integral equations on each local sub-domain are shown. By using the new technique, the results are more accurate and programming work is easier.

ON COMPLETENESS AND COMPLETION OF METRIC MAPPINGS

Nguyen Thi Hong Van

Faculty of Mathematics, Mechanics and Informatics, VNU University of Science

Abstract: In this report we introduce some characterizations of completeness for metric mappings defined by B. A. Pasynkov in 1999. These results are used to construct the completion of such mappings 1) by a method close to the standard completion method of metric spaces for the case of any metric mappings, and 2) by the standard way in the case when the range of the mapping is first-countable Hausdorff. In the end of the report we introduce notions of the fibrewise complete extension and the fibrewise completion of a metric mapping, study relations between them and the completion of a metric mapping.

DANH SÁCH CÁC POSTER

1. Tổng quan về phân tích tình cảm trong văn bản
Hứa Thị An
Khoa Toán - Cơ - Tin học, Trường Đại học Khoa học Tự nhiên
2. Fixed point theorems of contractive completely random operators
Phạm Thế Anh*, Đặng Hùng Thắng**
**Khoa Khoa học, HV Kỹ thuật Quân sự, **Khoa Toán - Cơ - Tin học, Trường Đại học Khoa học Tự nhiên*
3. Xích Markov dùng xác định liên kết dữ liệu
Tô Thị Vân Anh*, Trịnh Quốc Anh
Khoa Toán - Cơ - Tin học, Trường Đại học Khoa học Tự nhiên
4. Stabilizer algebra of adjoint- invariant forms
Trần Văn Độ
Lớp K55 Toán Tài năng, Trường Đại học Khoa học Tự nhiên
5. Parallel iteratively regularized Gauss-Newton method for systems of nonlinear ill-posed equations
Vũ Tiến Dũng*, Phạm Kỳ Anh
Khoa Toán - Cơ - Tin học, Trường Đại học Khoa học Tự nhiên
6. Phương pháp lặp song song dạng Runge-Kutta-Nystrom hai bước một
La Trí Dũng*, Nguyễn Hữu Công**
**Khoa khoa học Cơ bản, HV Phòng Không Không Quân, **Khoa Sau ĐH, ĐHQGHN*

7. On Whitney inequality for local anisotropic polynomial L_p - approximation

Nguyễn Văn Dũng*, **Nguyễn Đình Hóa****, **Đình Dũng****

**Bộ môn Toán giải tích, Khoa KHCN, Trường Đại học GTVT, **Viện Công nghệ thông tin, ĐHQG HN*

8. Integral manifold and asymptotic behavior of solution of some class of evolution equation

Trịnh Viết Được

Khoa Toán - Cơ - Tin học, Trường Đại học Khoa học Tự nhiên

9. The speed of Stoneley waves in bonded isotropic elastic half-spaces

Phạm Thị Hà Giang*, **Phạm Chí Vĩnh****

**Khoa Xây dựng Đại học Kiến trúc Hà Nội, **Khoa Toán - Cơ - Tin học, Trường Đại học Khoa học Tự nhiên*

10. Hệ thống dịch máy Moses và xây dựng kho ngữ liệu song ngữ Việt - Anh trong lĩnh vực du lịch

Nguyễn Tiên Hà

Khoa Toán - Cơ - Tin học, Trường Đại học Khoa học Tự nhiên

11. Khai thác nhanh itemset trên CSDL số lượng

Nguyễn Duy Hàm*, **Võ Đình Bẩy****, **Nguyễn Thị Hồng Minh*****

Trường Đại học ANND, **Trường Đại học KTCN TPHCM, *Khoa Sau ĐH, ĐHQG HN*

12. Algorithms a clustering technique to determine the Vietnamese part-of-speech (POS)

Nguyễn Minh Hiệp*, **Nguyễn Thị Minh Huyền****

**Đại học Đà Lạt, **Khoa Toán - Cơ - Tin học, Trường Đại học Khoa học Tự nhiên*

13. Parallel and sequential hybrid methods for a finite family of asymptotically quasi ϕ - nonexpansive mappings

Đặng Văn Hiếu*, **Phạm Kỳ Anh****

**Trường sĩ quan Không quân, **Khoa Toán - Cơ - Tin học, Trường Đại học Khoa học Tự nhiên*

14. Tiêu chuẩn đối ngẫu trong phương pháp tuyến tính hóa tương đương cho hệ phi tuyến nhiều bậc tự do chịu kích động ngẫu nhiên

Nguyễn Như Hiếu

Viện Cơ học, Viện Hàn lâm Khoa học và Công nghệ Việt Nam

15. Nonlinear static analysis of functionally graded shells

Lê Khả Hòa

Khoa Khoa học Cơ bản, Học viện Hậu cần

16. Một số kỹ thuật tăng tốc tính toán bóng cho các đối tượng 3D trong thực tạo ảo

Trịnh Xuân Hùng*, Trịnh Hiền Anh, Hà Mạnh Toàn****

**Khoa Toán - Cơ - Tin học, Trường Đại học Khoa học Tự nhiên, **Viện CNTT, Viện HLKH&CNVN*

17. On existence of weak solutions for a p-Laplacian system at resonance

Bùi Quốc Hưng

Khoa Công nghệ Thông tin, Học viện Kỹ thuật Quân sự

18. Độ dài steenrod của không gian xạ ảnh thực cách tiếp cận tổ hợp

Nguyễn Đức Khánh

Lớp K55 Toán Tài năng, Trường Đại học Khoa học Tự nhiên

19. Convex hull problem, some improvements and applications

Nguyễn Kiều Linh

Khoa Toán - Cơ - Tin học, Trường Đại học Khoa học Tự nhiên

20. Dependency parsing in Vietnamese

Nguyễn Thị Lương*, Lê Hồng Phương

Khoa Toán - Cơ - Tin học, Trường Đại học Khoa học Tự nhiên

21. The Hartley transform with extended kernel

Lại Tiên Minh

Trường Đại học Kiến trúc Hà Nội

22. Nonlinear dynamic analysis of functionally graded shells

Vũ Hoài Nam

Đại học Công nghệ Giao thông Vận tải

23. Tính toán tấm và vỏ bằng vật liệu cơ tính biến thiên có gia cường

Nguyễn Thị Nga

Khoa Toán - Cơ - Tin học, Trường Đại học Khoa học Tự nhiên

24. Dáng điều tiệm cận và tính ổn định của nghiệm của phương trình sai phân
ẩn tuyến tính chỉ số 1

Ngô Thị Thanh Nga

Khoa Toán tin ứng dụng, Trường đại học Thăng Long

25. Dynamic vibration absorber for pendulum structures

Nguyễn Xuân Nguyễn

Khoa Toán - Cơ - Tin học, Trường Đại học Khoa học Tự nhiên

26. Tối ưu không gian trạng thái của thuật toán aho-corasick sử dụng kỹ thuật
nén dòng và bảng chỉ số

Lê Đăng Nguyên*, Lê Đắc Như* , Lê Trọng Vĩnh**

**Trường Đại học Hải Phòng, **Khoa Toán - Cơ - Tin học, Trường Đại học Khoa học Tự nhiên*

27. Second-order necessary optimality conditions for semilinear elliptic problems

Vũ Hữu Nhựt

Học viện Quản lý Giáo dục

28. MMAS algorithm applied to optimal resource allocation to support QoS requirements in NGNs

Lê Đắc Như* , Ngô Hồng Sơn , Lê Trọng Vĩnh*****

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Mai Nam Phong

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Nguyễn Thị Tâm, Lê Hoàng Sơn, Lê Trọng Vĩnh

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Đỗ Duy Thành*, Nguyễn Ngọc Anh, Phạm Kỳ Anh *****

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Lưu Xuân Trường*, Võ Thị Như Quỳnh

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Lê Anh Tuấn*, Nguyễn Hữu Du, Nguyễn Thanh Diệu

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