

ĐẠI HỌC QUỐC GIA THÀNH PHỐ HỒ CHÍ MINH
TRƯỜNG ĐẠI HỌC KHOA HỌC TỰ NHIÊN
KHOA TOÁN-TIN HỌC

Thành phố Hồ Chí Minh, ngày 11 tháng 11 năm 2024

TIỂU BAN TOÁN-TIN HỌC

**HỘI NGHỊ KHOA HỌC LẦN 14 TRƯỜNG ĐẠI HỌC KHOA HỌC
TỰ NHIÊN -- ĐHQG-HCM**

Từ ngày 11 đến 16 tháng 11 năm 2024

Trường Đại học Khoa học Tự nhiên, định kỳ hai năm một lần, tổ chức Hội nghị Khoa học toàn trường cho tất cả các ngành khoa học, các lĩnh vực nghiên cứu, đào tạo của trường. Đây là diễn đàn để các nhà khoa học của trường và các đơn vị có quan hệ hợp tác trình bày kết quả nghiên cứu khoa học. Ngoài ra, Hội nghị cũng là dịp để giao lưu, trao đổi tìm ý tưởng, giải pháp cho các vấn đề khoa học và công nghệ, đẩy mạnh hợp tác, hình thành các nghiên cứu liên ngành, liên lĩnh vực trong và ngoài trường. Một mục tiêu không kém phần quan trọng nữa của Hội nghị là tạo cơ hội cho các nhà khoa học trẻ, nghiên cứu sinh, học viên cao học, sinh viên trong trường báo cáo các kết quả của mình.

Hội nghị khoa học lần XIV của Trường Đại học Khoa học Tự nhiên, ĐHQG-HCM (VNUHCM-US-Conf²⁴) sẽ được tổ chức **từ ngày 11 đến ngày 16 tháng 11 năm 2024** tại trường Đại học Khoa học Tự nhiên, ĐHQG-HCM.

Website hội nghị: <https://hnkh.hcmus.edu.vn/>

Hội nghị có Tiểu ban Toán-Tin học. Bên cạnh thông báo của Trường thì dưới đây là thông tin chi tiết hơn về Tiểu ban Toán-Tin học.

1. Thành viên ban tổ chức của tiểu ban

PGS.TS. Mai Hoàng Biên, *trưởng tiểu ban*

TS. Võ Đức Cẩm Hải, *ủy viên*

TS. Hoàng Văn Hà, *ủy viên*

GS.TS. Đặng Đức Trọng, *ủy viên*

PGS.TS. Nguyễn Lê Hoàng Anh, *ủy viên*

PGS.TS. Nguyễn Thanh Bình, *ủy viên*

PGS.TS. Lý Kim Hà, *ủy viên*

TS. Bùi Xuân Thắng, *Thư ký*.

2. Thành phần tham gia hội nghị tại Tiểu ban Toán-Tin học

- Các nhà khoa học, cán bộ giảng dạy, nghiên cứu trong và ngoài nước thuộc các lĩnh vực liên quan đến Toán và Tin học.
- Cán bộ giảng dạy, nghiên cứu, học viên sau đại học, sinh viên Trường Đại học Khoa học Tự nhiên, ĐHQG-HCM liên quan đến Toán và Tin học.

3. Hình thức tổ chức

Các báo cáo miệng (oral) và treo bảng (poster).

4. Các Phân ban của Tiểu ban Toán-Tin học và địa chỉ liên hệ

Trưởng tiểu ban Toán-Tin học: PGS.TS. Mai Hoàng Biên (mhbien@hcmus.edu.vn), Thư ký tiểu ban: TS. Bùi Xuân Thắng (bxthang@hcmus.edu.vn).

Thư ký hỗ trợ: Lê Thiện Đạt, Nguyễn Ngọc Hoàng Anh, Nguyễn Thanh Duy.

Tiểu ban Toán-Tin học có các hướng nghiên cứu và người Chủ trì như sau:

- **Đại số và lý thuyết số:** Mai Hoàng Biên (mhbien@hcmus.edu.vn), Nguyễn Anh Thi (nathi@hcmus.edu.vn).
- **Toán Ứng dụng và Tin học:** Nguyễn Lê Hoàng Anh (nlhanh@hcmus.edu.vn), Nguyễn Đăng Khoa (ndkhoa@hcmus.edu.vn), Võ Sĩ Trọng Long (vstlong@hcmus.edu.vn), Vũ Đỗ Huy Cường

(vdhcuong@hcmus.edu.vn), Nguyễn Tiến Đạt
(ntdat@hcmus.edu.vn),

- ***Giải tích và các vấn đề liên quan:*** Lý Kim Hà (lkha@hcmus.edu.vn), Nguyễn Thành Long, Lê Thị Phương Ngọc, Đoàn Thị Như Quỳnh, Nguyễn Hữu Nhân, Nguyễn Anh Triết, Huỳnh Thanh Toàn.

5. Nội dung chương trình

Phân ban: TOÁN ỨNG DỤNG VÀ TIN HỌC

Phòng: C41

SÁNG THỨ SÁU, 15/11/2024

Phiên 1: Lý thuyết tối ưu

Chủ tọa: Nguyễn Lê Hoàng Anh

8.00-8.30	Nguyễn Thị Thu Vân, <i>Maximal Monotone Operator Splitting Method.</i>
8.30-9.00	Nguyễn Đăng Khoa, <i>Fast convex optimization via closed-loop time scaling of gradient dynamics.</i>
9.00-9.30	Lê Thị Thanh Hải, <i>An inertial extragradient method for solving strongly pseudomonotone equilibrium problems in Hilbert spaces.</i>
9.30-10.00	Coffee break

Phiên 2: Lý thuyết tối ưu

Chủ tọa: Nguyễn Thị Thu Vân

10.00-10.30	Mai Văn Duy, Nguyễn Minh Tùng <i>Optimality conditions for nonsmooth adjustable robust optimization problems via Mordukhovich subdifferential.</i>
10.30-11.00	Nguyễn Thanh Toàn, <i>The inverse k-max combinatorial optimization problem.</i>

CHIỀU THỨ SÁU, 15/11/2024

Phiên 3: Lý thuyết tối ưu

Chủ tọa: Võ Sĩ Trọng Long

13.00-13.30	Võ Thành Tài, <i>Continuity of the Solution Map to a Parametric Multiobjective Optimal Control Problem.</i>
13.30-14.00	Nguyễn Cảnh Hùng,

	<i>Solution Existence for a Class of Nonsmooth Robust Optimization Problems.</i>
14.00-14.30	Lâm Văn Đầy, <i>Stability of solution sets of set-optimization problems.</i>
14.30-15.00	Coffee break

Phiên 4: Lý thuyết tối ưu

Chủ tọa: Nguyễn Đăng Khoa

15.00-15.30	Võ Thị Mộng Thuý, <i>Hausdorff continuity for weakly Henig efficient solution maps of set optimization problems.</i>
15.30-16.00	Huỳnh Ngọc Cẩm, Võ Đức Thịnh <i>Subdifferentials with degrees of freedom and applications to optimization problems.</i>

Phòng: C42

SÁNG THỨ SÁU, 15/11/2024

Phiên 1: Cơ học

Chủ toạ: Vũ Đổ Huy Cường

8.00-8.30	Thao Thuan Vu Ho, <i>Hamiltonian approach to 2-layer dispersive stratified fluids.</i>
8.30-9.00	Bui Xuan Thang, <i>A nonlinear analysis of stiffened plate by using smoothed finite element method base on discrete shear gap using three-node triangular element element.</i>
9.00-9.30	Vũ Đổ Huy Cường, Duy Ly, Tu Vo, Thuy Truong <i>Application of MITC4 element and zigzag methods for analyzing the behavior of electromagnetic composite plates</i>
9.30-10.00	Coffee break

Phiên 2: Tin học ứng dụng – Thống kê

Chủ toạ: Nguyễn Tiến Đạt

10.00-10.30	Thanh Hoàng Nguyễn <i>Density estimation of a mixture distribution with stable distribution error</i>
10.30-11.00	Mai-Thao Le, <i>Comparison between Apriori and FP- Growth Algorithm for Fine Needle Aspirate (FNA) of a Breast Mass</i>

Phân ban: ĐẠI SỐ VÀ LÝ THUYẾT SỐ

SÁNG THỨ BẢY, 16/11/2024

Phòng: C43A

Phiên 1:

Chủ tọa: Mai Hoàng Biên

8.30-8.45	Đỗ Hoàng Việt, <i>ON THE DEPTH AND REGULARITY OF SYMBOLIC POWERS OF FIBER PRODUCTS</i>
8.50-9.05	Trần Nam Sơn, <i>ON THE LVOV-KAPLANSKY CONJECTURE FOR A CLASS OF POLYNOMIALS</i>
9.10-9.25	Nguyễn Cao Đăng, <i>ON STRICT GENERALIZED POWER CENTRAL GROUP IDENTITIES IN SKEW GROUP ALGEBRAS OF LOCALLY FINITE GROUPS</i>
9.30-9.45	Trương Hữu Dũng, <i>ON KURSOV'S THEOREM FOR MATRICES OVER DIVISION RINGS</i>
9.50-10.05	Nguyễn Anh Thi, <i>A BRIEF INTRODUCTION TO ENUMERATION OF TILINGS AND SOME RELATED PROBLEMS</i>
10.05-10.20	Coffee break

Phiên 2:

Chủ tọa: Nguyễn Anh Thi

10.20-10.35	Võ Hoàng Minh Thư, <i>A NOTE ON DIVISION RINGS SATISFYING GENERALIZED RATIONAL IDENTITIES WITH ANTI-AUTOMORPHISMS</i>
10.40-10.55	Trần Nguyễn Nam Hưng, <i>ASSOCIATED GRAPHS WITH RESPECT TO CERTAIN MATRIX DECOMPOSITIONS</i>
11.00-11.15	Phan Hoàng Nam,

	<i>DECOMPOSITION OF REAL SYMPLECTIC MATRICES INTO COMMUTATORS OF SYMPLECTIC INVOLUTIONS</i>
11.20-11.35	Đào Trọng Toàn, <i>CONSTRUCTING MACAULAY RINGS AND MACAULAY POSETS</i>
12.00	Giải lao, chụp ảnh lưu niệm cơm trưa

Phân ban: GIẢI TÍCH VÀ CÁC VẤN ĐỀ LIÊN QUAN

Tổ chức tại 2 phòng trong ngày thứ 6, 15/11/2024: C43A – C43B

SÁNG THỨ 6, 15/11/2024

Phiên 1: Phòng C43A

Chủ tọa: Nguyễn Thành Long

8.30-9.00	Lê Thị Phương Ngọc, Nguyễn Thành Long <i>The solvability and properties of solutions of a higher-order integrodifferential equation in N variables with values in a general Banach space</i>
09.00 – 09.20	Đoàn Thị Như Quỳnh, Hồ Thái Lyen, <i>An accelerated iterative algorithm for a nonlinear wave equation containing a nonlinear viscoelastic term</i>
9.20-9.40	Khổng Thị Thảo Uyên, Nguyễn Anh Triết, Lê Thị Phương Ngọc <i>On a Robin-Dirichlet problem for a system of nonlinear pseudoparabolic equations with Kirchhoff and viscoelastic terms</i>
09.40- 10.00	Dzung Vu Nguyen, Le Thi Phuong Ngoc <i>Approximation of a boundary problem for a system of nonlinear Carrier wave equations by approximating the Carrier terms with their integral sums</i>
10.00- 10.20	Coffee break

Phiên 2: Phòng C43A

Chủ tọa: Lê Thị Phương Ngọc

10.20- 10.40	Nguyễn Sơn Hồng Hạnh, Nguyễn Hữu Nhân, Nguyễn Anh Triết <i>Existence and blow-up of solutions for certain damped Love-type wave equations with p-Laplacian and memory terms</i>
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10.40- 11.00	Lê Hữu Kỳ Sơn, Nguyễn Lê Thi, Trần Thị Kim Thoa <i>General decay estimates and blow-up for solutions of a Kirchhoff-Carrier type viscoelastic wave equation in an annular domain with strong decaying terms</i>
11.00- 11.20	Lý Ánh Dương, Võ Thị Tuyết Mai, Lê Hữu Kỳ Sơn <i>The Neumann-Dirichlet problem for the Kirchhoff-Carrier-type nonlinear wave equation containing a nonlinear viscoelastic term</i>
11.20- 11.40	Dương Thị Mộng Thường, Đoàn Thị Như Quỳnh <i>Asymptotic expansion of the solution to the Dirichlet problem for a nonlinear wave equation containing a nonlinear viscoelastic term</i>

11.30-14.00: NGHỈ TRƯA TỰ DO

CHIỀU THỨ 6, 15/11/2024

Phiên 3: Phòng C43A

Chủ tọa: Đoàn Thị Như Quỳnh

14.00- 14.30	Nguyễn Hữu Nhân, Lê Hữu Kỳ Sơn, Bùi Đức Nam, Dzung Vu Nguyen <i>Some results related to boundary value problems for a swelling porous elastic system</i>
14.30- 14.50	Cao Quốc Duy, Nguyễn Hữu Nhân, Lê Thị Phương Ngọc <i>On a class of fourth-order nonlinear Kirchhoff-Carrier type wave equations with hinged boundary conditions</i>
14.50- 15.10	Phạm Nguyễn Nhật Khanh, Nguyễn Hữu Nhân, Lê Thị Phương Ngọc <i>On a nonlinear boundary problem for a system of beam-heat equations with memory terms</i>
15.10- 15.30	Võ Thị Tuyết Mai, Nguyễn Thị Thanh Thúy <i>Asymptotic expansion in two small parameters of solutions to the Neumann -Dirichlet problem for the nonlinear Kirchhoff-Carrier-Love type wave equation</i>

15.30- 15.50	<i>Coffee break</i>
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Phiên 4: Phòng C43A

Chủ tọa: Nguyễn Hữu Nhân

15.50- 16.10	Bùi Đức Nam, Mã Thái Vinh, Nguyễn Anh Triết <i>Existence and generalized decay of solutions for a Kirchhoff-Carrier type viscoelastic wave system with Balakrishnan-Taylor damping</i>
16.10- 16.30	Trần Hòa Phú, Lý Ánh Dương <i>Existence, blow-up, and exponential decay of solutions for a nonlinear wave equation with two-point nonlinear boundary conditions</i>
16.30- 16.50	Dzung Vu Nguyen, Lê Tuấn Khải, Phạm Nguyễn Nhật Khanh - <i>High-order iterative algorithm for Kirchhoff-type wave equations with a source containing a finite number of unknown values</i>
16.50- 17.10	Bế mạc

SÁNG THỨ 6, 15/11/2024

Phiên 1: Phòng C43B

Chủ tọa: Lý Kim Hà

8.30-9.00	Trần Thị Khiếu <i>Recovering the temperature distribution for multi-term time-fractional sideways diffusion equations</i>
09.00 – 09.20	Trang Công Bằng, Hung Vo, Cuong Vu <i>An age-structured model for population facing a climate change</i>
9.20-9.40	Trần Quang Minh

	<i>Local Hadamard Well-Posedness and Long-Time Dynamics for a Nonlinear Navier-Lamé System</i>
09.40-10.00	Ngô Thị Hồng <i>Generalized Product Hausdorff Operator on Two-Weighted Morrey-Herz Spaces</i>
10.00-10.20	Coffee break

Phiên 2: Phòng C43B

Chủ tọa: Trần Thị Khiếu

10.20-10.40	Nguyễn Thị Thanh Lý <i>The stability of two general multi-variable functional equations on quasi-Banach spaces</i>
10.40-11.00	Phạm Hữu Trung <i>L^p estimate for the Cauchy-Leray-Fantappi`e integral on certain class of weakly pseudoconvex domains</i>
11.00-11.20	Giang L.Truong, Nam V.Trung, Vy N.Tuong <i>An Improved Gradient Estimate For Solutions To Very Singular Quasilinear Elliptic Equations In Weighted Lorentz Spaces</i>
11.20-11.40	11g20 – 11g40 Nguyễn Tuấn Duy, Phạm Thị Thu Hiền <i>Hardy and Caffarelli-Kohn-Nirenberg Inequalities with nonradial weights</i>

11.30-14.00: NGHỈ TRƯA TỰ DO

CHIỀU THỨ 6, 15/11/2024

Phiên 3: Phòng C43B

Chủ tọa: Nguyễn Anh Triết

14.00- 14.30	Huỳnh Thanh Toàn <i>Soliton amplitude dynamics of perturbed nonlinear Schrödinger equations</i>
14.30- 14.50	Nguyễn Phúc Nghĩa, Huỳnh Văn Dũng, Lê Tuấn Khải <i>On a system of nonlinear functional equations in a two-dimensional domain</i>
14.50- 15.10	Võ Anh Khôi, Lê Thị Phương Ngọc <i>Properties of solutions to the Neumann-Dirichlet problem for a nonlinear porous elastic system with viscous and strongly decaying terms</i>
15.10- 15.30	Trần Nguyên Khang, Nguyễn Tuấn Tài, Lê Thị Phương Ngọc - <i>A minor generalization of a nonlinear functional integral equation</i>
15.30- 15.50	<i>Coffee break</i>

Phiên 4: Phòng C43B

Chủ tọa: Huỳnh Thanh Toàn

15.50- 16.10	Võ Đăng Khoa, Nguyễn Minh Quân <i>Frequency Shift Induced by Soliton Interaction in Nonlinear Waveguides with a General Nonlinear Damping</i>
16.10- 16.30	Gia Khanh Tran, Tan Dat Khuu <i>Regularity For Non-Uniformly Elliptic Double Obstacle Problems With Fractional Maximal Operators</i>
16.30- 16.50	Nguyễn Thị Thanh Thúy, Mã Thái Vinh, Nguyễn Anh Triết - <i>The existence, blow-up, and general decay of solutions to a Robin problem for a viscous elastic wave equation with a logarithmic nonlinear source</i>
16.50- 17.10	Bế mạc

6. Các tóm tắt báo cáo

6.1 Phân ban Toán ứng dụng và Tin học

Nguyễn Thị Thu Vân

MAXIMAL MONOTONE OPERATOR SPLITTING METHOD.

Finding the zero point of a maximal monotone operator is a central problem in various fields of optimization and analysis. In this talk, we will introduce splitting methods for solving this problem and discuss their applications.

Nguyễn Đăng Khoa

FAST CONVEX OPTIMIZATION VIA CLOSED-LOOP TIME SCALING OF GRADIENT DYNAMICS.

In this talk, we develop a general framework for adaptive accelerated gradient methods for convex optimization problems. They are based on damped inertial dynamics where the coefficients are designed in a closed-loop way. Our approach leads to parallel algorithmic results, that we study in the case of proximal algorithms.

Lê Thị Thanh Hải

AN INERTIAL EXTRAGRADIENT METHOD FOR SOLVING STRONGLY PSEUDOMONOTONE EQUILIBRIUM PROBLEMS IN HILBERT SPACES.

In this work, we propose an inertial extragradient method for solving strongly pseudomonotone equilibrium problems utilizing a novel self-adaptive stepsize approach. We establish the R-linear convergence rate of the proposed method without prior knowledge of the Lipschitz-type constants associated with the bifunction. We also discuss the application of the obtained results to variational inequality problems involving strongly pseudomonotone and Lipschitz continuous mapping. Numerical examples are presented to illustrate the efficiency of the proposed method.

Mai Văn Duy, Nguyễn Minh Tùng

*OPTIMALITY CONDITIONS FOR NONSMOOTH ADJUSTABLE
ROBUST OPTIMIZATION PROBLEMS VIA MORDUKHOVICH
SUBDIFFERENTIAL.*

In this talk, we investigate a nonsmooth adjustable robust optimization problem (ARP) with general constraints. First, we study the feasible set structure of (ARP) and provide a non-adjustable reformulation for it. Then, under regularity conditions, necessary optimality conditions for local and sharp solutions are derived. Some relationships and sufficient conditions for these regularity conditions are also investigated. Furthermore, using the concepts of local convexity and generalized convexity, we also provide some sufficient conditions for global and sharp solutions. Finally, as applications, we investigate the necessary and sufficient optimality conditions for weakly efficient, efficient, properly efficient and strongly isolated solutions of (ARMP).

Nguyễn Thanh Toàn

THE INVERSE K-MAX COMBINATORIAL OPTIMIZATION PROBLEM

Classical combinatorial optimization concerns finding a feasible subset of a ground set in order to optimize an objective function. We address in this article the inverse optimization problem with the k -max function. In other words, we attempt to perturb the weights of elements in the ground set at minimum total cost to make a predetermined subset optimal in the fashion of the k -max objective with respect to the perturbed weights. We first show that the problem is in general NP-hard. Regarding the case of independent feasible subsets, a combinatorial $O(n^2 \log n)$ time algorithm is developed, where n is the number of elements in E . Special cases with improved complexity are also discussed.

Võ Thành Tài

Continuity of the Solution Map to a Parametric Multiobjective Optimal Control Problem.

In this talk, we focus on the stability of nonlinear multiobjective optimal control problems. First, by utilizing the equimeasurability and arcwise connectedness conditions of the admissible control set, we establish the compactness and arcwise connectedness of the feasible solution set. Next, we leverage the quasi-arcwise connected integrand within the multiobjective function to examine the semicontinuity of the efficient solution map in a parametric nonlinear multiobjective optimal control problem. When the multiobjective function does not satisfy this condition, we introduce an alternative assumption to investigate the semicontinuity properties of the efficient solution maps of the reference problem.

Nguyễn Cảnh Hùng

SOLUTION EXISTENCE FOR A CLASS OF NONSMOOTH ROBUST OPTIMIZATION PROBLEMS.

We first introduce a concept called extended tangency variety and show how a robust optimization problem can be transformed into a minimizing problem of the corresponding tangency variety. Next, this concept together with a constraint qualification condition and the boundedness of the objective function are utilized to provide relationships among the concepts of robust properness, robust M-tameness and robust Palais-Smale condition related to the considered problem. Finally, the obtained results are also employed to derive necessary and sufficient conditions for the existence of global optimal solutions to the underlying robust optimization problem.

Lâm Văn Đầy

STABILITY OF SOLUTION SETS OF SET-OPTIMIZATION PROBLEMS.

In this presentation, we explore set optimization problems based on the set less relation, focusing on stability conditions for both for both efficient and weakly efficient solutions. We start by introducing key concepts related to the induction property, which we then apply to analyze the external stability of these solution sets. Following this, we leverage domination properties to establish sufficient conditions for the internal stability. Many examples are presented to highlight the innovation and importance of our findings.

Võ Thị Mộng Thuý

*HAUSDORFF CONTINUITY FOR WEAKLY HENIG EFFICIENT
SOLUTION MAPS OF SET OPTIMIZATION PROBLEMS.*

In this talk, we study Hausdorff continuity for weakly Henig efficient solution maps of set optimization problems. First, we recall some key properties of Henig dilating cones, which will be useful in later sections. Next, we examine certain characteristics of nonlinear scalarization functions, including (semi)continuity and convexity. Following this, we derive a scalar representation of weakly Henig efficient solutions by using these scalarization functions. Finally, based on the scalar representation results and generalized convexity conditions on the objective functions, we establish sufficient conditions of Hausdorff continuity for weakly Henig efficient solution maps of parametric set optimization problems.

Huỳnh Ngọc Cẩm, Võ Đức Thịnh

*SUBDIFFERENTIALS WITH DEGREES OF FREEDOM AND
APPLICATIONS TO OPTIMIZATION PROBLEMS.*

In this work, we first present a new class of generalized differentials, namely subdifferentials with degrees of freedom as well as their applications in nonsmooth optimization problems. We then establish some computation rules for subdifferentials with degree of freedom of functions under basic qualification constraints. By using these computation rules, we provide necessary and sufficient conditions for unconstrained optimization problems and for optimization problems with geometric constraints.

Thao Thuan Vu Ho,

HAMILTONIAN APPROACH TO 2-LAYER DISPERSIVE STRATIFIED FLUIDS.

A Hamiltonian reduction approach is defined, studied, and finally used to derive asymptotic models of internal wave propagation in density stratified fluids in two-dimensional domains. Beginning with the general Hamiltonian formalism of Benjamin (1986 J. Fluid Mech) for an ideal, stably stratified Euler fluid, the corresponding structure is systematically reduced to the setup of two homogeneous fluids under gravity, separated by an interface and confined between two infinite horizontal plates.

Bui Xuan Thang,

A NONLINEAR ANALYSIS OF STIFFENED PLATE BY USING SMOOTHED FINITE ELEMENT METHOD BASE ON DISCRETE SHEAR GAP USING THREE-NODE TRIANGULAR ELEMENT ELEMENT.

The paper presents an extension of the cell-based smoothed discrete shear gap method (CS-DSG3) using three-node triangular elements for nonlinear analyses of stiffened plates. In this paper, the nonlinear displacement-strain is included in the governing equations. The CS-DSG3 and iterative Newton – Raphson method are used to analysis the displacement of the stiffened. The accuracy and reliability of the proposed method is verified by comparing its numerical solutions with those of others available numerical results.

Vũ Đỗ Huy Cường,

APPLICATION OF MITC4 ELEMENT AND ZIGZAG METHODS FOR ANALYZING THE BEHAVIOR OF ELECTROMAGNETIC COMPOSITE PLATES

This study explores the application of the MITC4 element, a high-precision quadratic element used in plate analysis, within zigzag methods for analyzing the behavior of electromagnetic composite plates. These advanced materials, which integrate both mechanical and electromagnetic properties, are extensively used in fields such as electronics, energy, and mechanical engineering. The zigzag method is a critical technique in composite material mechanics, enabling accurate simulation of nonlinear behavior in the composite layers of plate structures, particularly in the interactions between layers with varying mechanical and electromagnetic properties. The combination of the MITC4 element with zigzag methods provides a robust tool for the precise assessment of the mechanical and electromagnetic characteristics of these plates, supporting design and analysis in material engineering. The results offer valuable insights into the behavior of composite plates and contribute to advancing new designs and applications in the field of electromagnetics.

Thanh Hoàng Nguyễn

DENSITY ESTIMATION OF A MIXTURE DISTRIBUTION WITH STABLE DISTRIBUTION ERROR

This paper tackles the statistical deconvolution challenge of estimating the probability distribution of a random variable, considering noisy observations affected by unknown error distributions. Introducing a semi-parametric approach, the study explores the application of stable distribution, particularly the Levy alpha-stable distribution, in diverse fields like finance, communication, and environmental research. The research extends its focus to non-continuous target variables, essential in evolutionary biology models dealing with gene mutations. The proposed estimators seek to provide reliable parameter estimates, including (a, σ, p, f_{X_c}) , even when the error distribution is not fully known. The study contributes practical insights to the deconvolution field, offering methodologies for parameter estimation in scenarios with unknown error distributions and non-continuous target variables, expanding the scope of existing research. Special aspects and minimax rates are discussed, providing a comprehensive understanding of the problem's intricacies and proposed solutions.

Mai-Thao Le

*COMPARISON BETWEEN APRIORI AND FP- GROWTH ALGORITHM
FOR FINE NEEDLE ASPIRATE (FNA) OF A BREAST MASS*

Breast cancer diagnosis from Fine Needle Aspirate (FNA) samples faces challenges stemming from the subjective interpretation of cytological features, which can lead to diagnostic variability. Accurate staging of the disease is crucial as it can significantly improve the chances of survival. The main approach employed in this study involves classifying patients into small groups based on their cytological features using clustering algorithms. Subsequently, association rules of these small groups were analyzed using the Apriori and FP-Growth algorithms. The analysis revealed association rules that contain overlapping features between benign and malignant diagnostic conditions, indicating a high likelihood of progression from certain benign groups to malignant states, with the top six features. The top two features for the group transitioning from benign to malignant exhibit a low likelihood, while the top seven features exhibit a moderate likelihood. Furthermore, the top four features for those diagnosed as malignant signify the most potent indication of malignancy. Additionally, both algorithms yield similar rules; however, the Apriori algorithm exhibits increased execution time and memory usage, particularly as the number of rules increases. The study's results offer valuable understanding of how breast cancer progresses and emphasize the potential of predictive models in predicting the advancement of the disease. Furthermore, the observed differences in algorithm performance underscore the importance of selecting appropriate algorithms for efficient analysis of association rules in large datasets.

6.2 Phân ban Đại số và lý thuyết số

Trương Hữu Dũng

ON KURSOV'S THEOREM FOR MATRICES OVER DIVISION RINGS

Let D be a division ring with center F and multiplicative group D^\times , where each element of the commutator subgroup of D^\times can be expressed as a product of at most s commutators. A known theorem of Kursov states that if D is finite-dimensional over F , then every element of the commutator subgroup of the general linear group over D can be expressed as a product of at most $s+1$ commutators. We show that this result remains valid when F has a sufficiently large number of elements, without requiring D to be finite-dimensional. Our approach not only improves upon recent results on matrix decompositions over division rings but also provides a look at the Engel word map for matrices over arbitrary algebras.

Nguyễn Cao Đăng

ON STRICT GENERALIZED POWER CENTRAL GROUP IDENTITIES IN SKEW GROUP ALGEBRAS OF LOCALLY FINITE GROUPS

Let $K \star^\sigma G$ be the skew group algebra over a non-absolute K of a locally finite group G induced by a group morphism $\sigma: G \rightarrow \text{Aut}(K)$. We study some assertions being equivalent of the assumption that the unit group $U(K \star^\sigma G)$ satisfies a strict generalized power central group identity.

Trần Nguyễn Nam Hưng

ASSOCIATED GRAPHS WITH RESPECT TO CERTAIN MATRIX DECOMPOSITIONS

This report outlines how to associate each matrix decomposition problem with a corresponding graph. It will then survey some interesting properties of these associated graphs, which may be direct corollaries of previous work on matrix decompositions. Finally, the report will discuss open questions regarding the structures of the associated graphs.

Phan Hoàng Nam

DECOMPOSITION OF REAL SYMPLECTIC MATRICES INTO COMMUTATORS OF SYMPLECTIC INVOLUTIONS

In this report, we investigate the structure of real symplectic matrices of size $2n$, where n is an integer greater than 1 . A matrix A is defined as symplectic if it satisfies the condition $A^T J A = J$, with J being a block matrix of the form $J = \begin{bmatrix} 0 & I_n \\ -I_n & 0 \end{bmatrix}$, where I_n is the identity matrix of size n . We explore the decomposition of real symplectic matrices and show that any real symplectic matrix of size $2n$ can be factored into the product of at most 17 commutators of real symplectic involutions.

Nguyễn Anh Thi

A BRIEF INTRODUCTION TO ENUMERATION OF TILINGS AND SOME RELATED PROBLEMS

Let $G=(V,E)$ be a simple graph, a perfect matching of G is a collection of disjoint edges which cover all vertices of G . The problems of perfect matchings can be equivalently phrased as the problems of tilings. For a given lattice L in the plane, and a finite lattice region R on it, a tile is a union of any two fundamental regions of L which share an edge, and a tiling of R is a complete covering of R with such non-overlapping tiles. A tiling of a region R can be identified with a perfect matching of its dual graph (the graph whose vertices are fundamental region of L contained in R , and whose edges connect those pairs of vertices which correspond to fundamental regions that share an edge). Enumeration of tilings is a subfield of combinatorics studying the total number of tilings of regions by similar pieces without gaps or overlaps. In this talk, we will introduce some famous problems in Enumeration of tilings that have been considered by many mathematicians. Furthermore, we also talk about some issues related to Cruciform regions that we have been studying.

Võ Hoàng Minh Thư

A NOTE ON DIVISION RINGS SATISFYING GENERALIZED RATIONAL IDENTITIES WITH ANTI-AUTOMORPHISMS

Let D be a division ring with infinite center F ; σ be an anti-automorphism of D và m be a positive integer such that $\sigma^m \neq \mathrm{Id}$. In this paper, we show that D satisfies a σ^m -GRI then D is centrally finite.

Đào Trọng Toàn

CONSTRUCTING MACAULAY RINGS AND MACAULAY POSETS

The study of Macaulay posets and Macaulay rings (also called Macaulay-Lex rings) traces its origins to Macaulay's work nearly a century ago. These mathematical structures are interconnected, with notable results such as the Clements-Lindström Theorem and the Macaulay Correspondence Theorem (these results can be found in \cite{1}), which demonstrate the interplay between certain concepts in both Algebra and Combinatorics. In this talk, we focus on constructing Macaulay posets and Macaulay rings through some algebraic and combinatorial operations.

Trần Nam Sơn

ON THE LVOV-KAPLANSKY CONJECTURE FOR A CLASS OF POLYNOMIALS

The well-known Lvov-Kaplansky conjecture states that the image of a multilinear polynomial evaluated on matrices over a field forms a vector space. This talk presents an affirmative answer to the conjecture in the case where the multilinear polynomial can be expressed as a product of two or more distinct multilinear polynomials, each of which is non-central and non-identity.

Đỗ Hoàng Việt

ON THE DEPTH AND REGULARITY OF SYMBOLIC POWERS OF
FIBER PRODUCTS

We study symbolic powers of the fiber product F of two ideals I and J living in different polynomial rings R and S , respectively. We prove that if $\text{depth}(R/I)$, $\text{depth}(S/J)$ are both positive then every symbolic power of F has depth two. We also provide an explicit formula for the regularity of the symbolic powers of F . Finally, we consider the asymptotic values of these homological invariants of the symbolic powers of the fiber product F .

6.3 Phân ban Giải tích và các vấn đề liên quan

Lê Thị Phương Ngọc, Nguyễn Thành Long

THE SOLVABILITY AND PROPERTIES OF SOLUTIONS OF A HIGHER-ORDER INTEGRODIFFERENTIAL EQUATION IN N VARIABLES WITH VALUES IN A GENERAL BANACH SPACE

This paper is devoted to the study of a high-order integrodifferential equation in N variables based on Krasnoselskii's fixed point theorem combined with the compactness criterion in a Banach space of functions. Here, we consider a nonlinear integrodifferential equation of order $(m+p+q)$ in N variables within a Banach space E . First, an appropriate Banach space $X_{\{*\}}$ of functions for the IDE is defined, and a criterion for relative compactness in $X_{\{*\}}$ is established, where $X_{\{*\}} = \{u \in C(\Omega; E) : D_1^{\{i\}}u, D_2^{\{j\}}D_1^{\{m\}}u, D_3^{\{k\}}D_2^{\{p\}}D_1^{\{m\}}u \in C(\Omega; E), i=1, m, j=1, p, k=1, q\}$. Next, under suitable assumptions on the given functions, by applying Krasnoselskii's fixed point theorem with respect to the function space $X_{\{*\}}$ as above, we prove that the IDE has at least one solution and that the set of solutions is compact. Furthermore, an example is provided to illustrate this approach.

Keywords. Nonlinear integrodifferential equation in N variables; The fixed point theorem of Krasnoselskii; Compactness criterion.
AMS Subject classification: 45G10, 47H10, 47N20, 65J15.

Đoàn Thị Như Quỳnh, Hồ Thái Lyen

AN ACCELERATED ITERATIVE ALGORITHM FOR A NONLINEAR WAVE EQUATION CONTAINING A NONLINEAR VISCOELASTIC TERM

In this report, we develop an accelerated algorithm for the Dirichlet problem for a class of nonlinear wave equations containing a nonlinear viscoelastic term. Under certain suitable conditions, we prove that this algorithm converges to the weak solution of the problem and the error is also estimated.

Keywords: Faedo-Galerkin method, accelerated algorithm, Nonlinear wave equation, Nonlinear viscoelastic term.

Khổng Thị Thảo Uyên, Nguyễn Anh Triết, Lê Thị Phương Ngọc

ON A ROBIN-DIRICHLET PROBLEM FOR A SYSTEM OF NONLINEAR PSEUDOPARABOLIC EQUATIONS WITH KIRCHHOFF AND VISCOELASTIC TERMS

In this report, we investigate a Robin-Dirichlet problem for a system of pseudoparabolic equations containing Kirchhoff and viscoelastic terms. First, the local existence and uniqueness of the weak solution are established by the Faedo-Galerkin method. Next, with suitable initial conditions, we obtain the global existence and general decay of weak solutions. Finally, using the concavity method, we prove that the solution blows up in finite time when the initial energy is nonnegative or negative, and then we determine the lifespan of the solution by finding the upper and lower bounds for the blow-up time.

Keywords: Nonlinear pseudoparabolic equations; Faedo-Galerkin method; local existence; blow-up; lifespan; global existence, general decay.

Dzung Vu Nguyen, Le Thi Phuong Ngoc

APPROXIMATION OF A BOUNDARY PROBLEM FOR A SYSTEM OF NONLINEAR CARRIER WAVE EQUATIONS BY APPROXIMATING THE CARRIER TERMS WITH THEIR INTEGRAL SUMS

This report addresses the approximation of a boundary problem for a system of nonlinear Carrier wave equations (CWEs) by approximating the Carrier terms with their integral sums. First, under suitable conditions, the linear approximation method, the Galerkin method, and compactness arguments ensure the unique existence of a weak solution (u^n, v^n) of the problem $(P_{\{n\}})$, for each $n \in \mathbb{N}$, for a system of nonlinear wave equations related to Maxwell fluid between two infinite coaxial circular cylinders. Next, we prove that the sequence $\{(u^n, v^n)\}$ converges to the weak solution (u, v) of the problem for a system of CWEs in a suitable function space. The proof method is based on a priori estimates and the use of the Aubin-Lions compactness lemma. Finally, we conclude the report with a remark related to open problems.

Keywords: System of nonlinear wave equations; The helical flows of Maxwell fluid; Kirchhoff-Carrier equations, Faedo-Galerkin method; Linearization method; Approximating the Carrier terms.
AMS subject classification: 35L20, 35L70, 35Q72.

Nguyễn Sơn Hồng Hạnh, Nguyễn Hữu Nhân, Nguyễn Anh Triết

EXISTENCE AND BLOW-UP OF SOLUTIONS FOR CERTAIN DAMPED LOVE-TYPE WAVE EQUATIONS WITH P-LAPLACIAN AND MEMORY TERMS

In this report, we examine certain Love-type damped wave equations that include the p -Laplacian and memory terms. Using linearization techniques, the Faedo-Galerkin method, and compactness arguments, we prove the existence and uniqueness of solutions for the problem. Moreover, under several appropriate assumptions, we also demonstrate that solutions with negative initial energy will blow up in finite time.

Keywords: Blow-up of solutions, Faedo-Galerkin method, Love-type equation, p -Laplacian.

Lê Hữu Kỳ Sơn, Nguyễn Lê Thi, Trần Thị Kim Thoa

GENERAL DECAY ESTIMATES AND BLOW-UP FOR SOLUTIONS OF A KIRCHHOFF-CARRIER TYPE VISCOELASTIC WAVE EQUATION IN AN ANNULAR DOMAIN WITH STRONG DECAYING TERMS

This report is dedicated to studying a Kirchhoff-Carrier-type wave equation in an annular domain with strong decay terms. Firstly, by applying linear approximation, the Faedo-Galerkin method, and a priori estimates with compactness arguments, we prove the existence and uniqueness of weak solutions for the proposed problem. Then, by constructing a Lyapunov functional, we present a blow-up result for solutions with negative initial energy. Finally, we establish a sufficient condition to ensure that any global weak solution decays generally.

Keywords: Faedo-Galerkin method, Kirchhoff-Carrier type, Viscoelastic wave equation, Strong decay term; Blow-up, General decay.

Lý Ánh Dương, Võ Thị Tuyết Mai, Lê Hữu Kỳ Sơn

THE NEUMANN-DIRICHLET PROBLEM FOR THE KIRCHHOFF-CARRIER-TYPE NONLINEAR WAVE EQUATION CONTAINING A NONLINEAR VISCOELASTIC TERM

This report investigates the Neumann-Dirichlet problem for a Kirchhoff-Carrier-type wave equation with a nonlinear viscoelastic term. The local existence is proven using the Faedo-Galerkin method and standard density arguments. Next, we establish some sufficient conditions to ensure the global existence and exponential decay of weak solutions.

Keywords: Faedo-Galerkin method, Kirchhoff-Carrier type, Wave equation, Local existence, Global existence, Exponential decay.

Note: This report has only three co-authors: Lý Ánh Dương, Võ Thị Tuyết Mai, and Lê Hữu Kỳ Sơn. The person named Nguyen Thanh Long is merely the submitter of this paper.

Dương Thị Mộng Thường, Đoàn Thị Như Quỳnh

ASYMPTOTIC EXPANSION OF THE SOLUTION TO THE DIRICHLET PROBLEM FOR A NONLINEAR WAVE EQUATION CONTAINING A NONLINEAR VISCOELASTIC TERM

In this report, we consider the Dirichlet problem for a nonlinear wave equation containing a nonlinear viscoelastic term. By using Taylor's formula to expand the nonlinear terms to the necessary order, we establish a high-order asymptotic expansion of the solutions in terms of a small parameter.

Keywords: Nonlinear wave equation; Nonlinear viscoelastic term; Asymptotic expansion.

Nguyễn Hữu Nhân, Lê Hữu Kỳ Sơn, Bùi Đức Nam, Dung Vu Nguyen

SOME RESULTS RELATED TO BOUNDARY VALUE PROBLEMS FOR A SWELLING POROUS ELASTIC SYSTEM

In this report, we study a one-dimensional swelling porous elastic system with neutral delay and porous damping acting on the second equation. Using linear approximation, the Faedo-Galerkin method, and a priori estimates with compactness arguments, we prove the local existence and uniqueness of solutions for the given problem. Furthermore, we also investigate several other properties of the solutions.

Keywords: Swelling porous elastic system; Neutral delay.

Cao Quốc Duy, Nguyễn Hữu Nhân, Lê Thị Phương Ngọc

ON A CLASS OF FOURTH-ORDER NONLINEAR KIRCHHOFF-CARRIER TYPE WAVE EQUATIONS WITH HINGED BOUNDARY CONDITIONS

In this report, we study a class of fourth-order wave equations containing damping and source terms given by the product of two nonlinear components. By applying linearization techniques, the Faedo-Galerkin method, and compactness arguments, we establish the existence and uniqueness of a weak solution for the problem. Furthermore, under several appropriate assumptions, we prove that the solution depends continuously on the nonlinear components involved in the problem. Keywords: Fourth-order wave equation; Kirchhoff-Carrier type; Continuous dependence; Faedo-Galerkin method; Hinged boundary conditions.

Phạm Nguyễn Nhật Khanh, Nguyễn Hữu Nhân, Lê Thị Phương Ngọc

ON A NONLINEAR BOUNDARY PROBLEM FOR A SYSTEM OF BEAM-HEAT EQUATIONS WITH MEMORY TERMS

We address an initial boundary value problem for a system of beam-heat equations with memory terms. By using linear approximation combined with the Faedo-Galerkin method, we first prove the local existence and uniqueness of weak solutions. Next, a problem corresponding to special nonlinear terms is also considered. Then, by establishing sufficient conditions and constructing appropriate energy functionals, we prove the global existence and general decay of solutions for the problem. Finally, the blow-up property of the solution is also examined.

Keywords: Beam-heat equations, Faedo-Galerkin method; Linearization method; Global existence; General decay; Blow-up.

Võ Thị Tuyết Mai, Nguyễn Thị Thanh Thúy

ASYMPTOTIC EXPANSION IN TWO SMALL PARAMETERS OF SOLUTIONS TO THE NEUMANN -DIRICHLET PROBLEM FOR THE NONLINEAR KIRCHHOFF-CARRIER-LOVE TYPE WAVE EQUATION

In this report, we consider the following nonlinear Kirchhoff-Carrier-Love wave equation

$$\begin{aligned}
 & \{ & \#1 & \} \\
 <K1.1 & \text{ilk="TABLE"} & > \\
 & u_{tt} - u_{ttxx} - \mu(t, \varepsilon_1 \|u(t)\|^2, \varepsilon_1 \|u_x(t)\|^2) u_{xx} \\
 & = f_0(x, t) + \varepsilon_2 f(x, t, u, u_x, u_t, u_{xt}), & 0 < x < 1, & 0 < t < T, \\
 & u_x(0, t) = u_x(1, t) = 0, \\
 & u(x, 0) = u_0(x), & & u_t(x, 0) = u_1(x), \\
 & </K1.1 & & >
 \end{aligned}$$

where u_0, u_1, μ, f_0, f are given functions, $\varepsilon_1, \varepsilon_2$ are small parameters and $\|u(t)\|^2 = \int_0^1 u^2(x, t) dx, \|u_x(t)\|^2 = \int_0^1 u_x^2(x, t) dx$. By using Taylor's expansion of the functions $\mu(t, y, z), f(x, t, u, u_x, u_t, u_{xt})$, up to order $N+1$, we establish a high-order asymptotic expansion of the solution in two small parameters $\varepsilon_1, \varepsilon_2$.

Keywords: Nonlinear Kirchhoff-Carrier-Love type wave equation; Faedo-Galerkin method; High-order asymptotic expansion; Small parameters.

Bùi Đức Nam, Mã Thái Vinh, Nguyễn Anh Triết

*EXISTENCE AND GENERALIZED DECAY OF SOLUTIONS FOR A
KIRCHHOFF-CARRIER TYPE VISCOELASTIC WAVE SYSTEM WITH
BALAKRISHNAN-TAYLOR DAMPING*

In this report, we study a Kirchhoff-Carrier type viscoelastic wave system with Balakrishnan-Taylor damping. By employing the linear approximation method and the Faedo-Galerkin method, we prove the existence and uniqueness of local weak solutions for the problem. Furthermore, by establishing sufficient conditions and constructing appropriate energy functionals, we demonstrate that every global solution will generally decay as time $t \rightarrow +\infty$.

Keywords: Viscoelastic wave equation, Kirchhoff-Carrier-type; Balakrishnan-Taylor damping; Faedo-Galerkin method; General decay.

Trần Hòa Phú, Lý Ánh Dương

*EXISTENCE, BLOW-UP, AND EXPONENTIAL DECAY OF SOLUTIONS
FOR A NONLINEAR WAVE EQUATION WITH TWO-POINT
NONLINEAR BOUNDARY CONDITIONS*

In this report, we study a nonlinear wave equation associated with two-point nonlinear boundary conditions. First, we present two theorems on the local existence of solutions. Next, under suitable conditions, we prove that any weak solution with negative initial energy will blow up in finite time. Finally, we provide a sufficient condition to ensure the global existence and exponential decay of weak solutions.

Keywords: Two-point type, Local existence, Global existence, Blow up in finite time, Exponential decay

Dzung Vu Nguyen, Lê Tuấn Khải, Phạm Nguyễn Nhật Khanh

*HIGH-ORDER ITERATIVE ALGORITHM FOR KIRCHHOFF-TYPE
WAVE EQUATIONS WITH A SOURCE CONTAINING A FINITE
NUMBER OF UNKNOWN VALUES*

In this report, we consider the Robin-Dirichlet problem for a Kirchhoff-type wave equation with a nonlinear source term $f=f(x,t,u(x,t),u(\eta_1,t),\dots,u(\eta_{\{q\}},t))$, where $\eta_1,\dots,\eta_{\{q\}}$ are real numbers such that $0<\eta_1<\dots<\eta_{\{q\}}<1$. Under the smoothness conditions of the source term and some additional conditions, we establish a high-order iterative algorithm for the problem and prove that this algorithm converges to the weak solution of the problem. We also provide an error estimate. Keywords: Faedo-Galerkin method; Robin-Dirichlet problem; High-order iterative algorithm; Kirchhoff-type equation.

Trần Thị Khiếu

*RECOVERING THE TEMPERATURE DISTRIBUTION FOR MULTI-
TERM TIME-FRACTIONAL SIDEWAYS DIFFUSION EQUATIONS*

In the current paper, an inverse boundary value problem so-called the sideways problem for the multi-term time-fractional diffusion equation is investigated. The problem of interest includes the recovering of the diffusion distribution from the boundary data. We prove that the problem is ill-posed as the solution does not continuously depend on the boundary data. We further propose a fractional filter method to regularize the problem. The stability and convergence of the proposed method are gingerly analyzed. Two numerical examples, with the support from the fast Fourier transform (FFT), are implemented to illustrate the theoretical results. The numerical results are consistent with the theoretical analysis.

Trang Công Bằng

*AN AGE-STRUCTURED MODEL FOR POPULATION FACING A
CLIMATE CHANGE*

One of the critical questions in biology is: "Can the species keep pace with a shifting climate?". In this study, we focus on a particular case, where the species is represented as an age-dependent population impacted by climate change. The model takes form of an age-structured heterogeneous reaction-diffusion equation with a forced shifting speed. To address this question, it is essential to investigate the long-time behavior of the equation via forced waves. We prove the existence, uniqueness and global stability of a KPP forced wave. Then, the long-time dynamics of the age-structured parabolic solution are determined under certain initial conditions. The presence of age-structure yields significant difficulties in studying the KPP forced wave. To validate our theoretical results, we conducted various numerical simulations across different scenarios, with varying initial conditions and parameters, to further elucidate the model's dynamic characteristics. These results provide deeper insights into the factors influencing species survival under changing climate conditions, enabling more precise predictions about the fate of species in future climate scenarios.

Trần Quang Minh

*LOCAL HADAMARD WELL-POSEDNESS AND LONG-TIME DYNAMICS
FOR A NONLINEAR NAVIER-LAMÉ SYSTEM*

In this paper, we examine a class of semilinear Navier-Lamé systems. Initially, we establish the local existence of solutions using monotone operator theory. Under appropriate assumptions, we then demonstrate that the weak solution is unique and continuously depends on the initial data. Subsequently, by constructing a family of potential wells, we analyze the global existence, asymptotic behavior, and blow-up of solutions for both subcritical and critical initial energy levels. This method is advantageous as our stabilization estimate does not introduce lower-order terms, resulting in a more concise proof of the asymptotic behavior. Finally, we establish conditions under which solutions blow up in finite time for any positive initial energy.

Ngô Thị Hồng

GENERALIZED PRODUCT HAUSDORFF OPERATOR ON TWO-WEIGHTED MORREY-HERZ SPACES

In this paper, we introduce the generalized product Hausdorff operator and study the boundedness of this operator on product two-weighted Morrey, Morrey-Herz spaces. As consequences, we obtain some results about the bounds of product Hausdorff operator associated with the Opdam-Cherednik transform and the sharp bounds for the product weighted Hardy-Littlewood average operator and the product Hardy-Cesàro operator on such spaces.

Nguyễn Thị Thanh Lý

THE STABILITY OF TWO GENERAL MULTI-VARIABLE FUNCTIONAL EQUATIONS ON QUASI-BANACH SPACES

The stability of functional equations has been interested by many authors. This issue is related to finding approximate solutions of some equations and the size of the difference between such approximate solutions and the mappings that satisfy the equation \sim exactly. The stability of functional equations has been developed in a variety of spaces. Recently, the authors have been interested in the stability of functional equations in quasi-Banach spaces and their generalizations.

In this paper, we study the stability of two general multi-variable functional equations on quasi-Banach spaces by the fixed point method. We also obtain generalizations of the early results on the stability of some classical equations in quasi-Banach \sim spaces.

Phạm Hữu Trung

*\$L^p\$ ESTIMATE FOR THE CAUCHY-LERAY-FANTAPPPI`E
INTEGRAL ON CERTAIN CLASS OF WEAKLY PSEUDOCONVEX
DOMAINS*

Let $\mathbb{H}_k = \{(z_1, z_2) \in \mathbb{C}^2 : \operatorname{Im} z_2 > |z_1|^{2k}\}$, for $k \in \mathbb{N}$, $k \geq 1$. In this report, we study L^p estimate for the Cauchy-Leray-Fantappi`e integral on \mathbb{H}_k , for $p \in [1, \infty]$. This is a joint work with Assoc. Prof. Ly Kim Ha.

Giang L.Truong, Nam V.Trung, Vy N.Tuong

*AN IMPROVED GRADIENT ESTIMATE FOR SOLUTIONS TO VERY
SINGULAR QUASILINEAR ELLIPTIC EQUATIONS IN WEIGHTED
LORENTZ SPACES*

The gradient estimates in the weighted Lorentz spaces for solutions to a class of quasi linear elliptic equations with a measure on the right-hand side are established using the idea of level-set inequality. Regularity results obtained in this paper are concerned with the quasilinear elliptic equations driven by p -Laplacian, under certain smoothness assumptions on the boundary of domain Ω and the data of the problem. Especially, this paper studies the “very singular” case for the growth exponent p , i.e. when $1 < p \leq (3n-2)/(2n-1)$. As far as we know, the presence of measure source term μ (being a bounded Radon measure) makes the study of regularity theory more challenging due to the notion of solutions and their reasonable existence. The contribution of this paper is the extension of previous results in weighted Lebesgue spaces.

Nguyễn Tuấn Duy, Phạm Thị Thu Hiền

*HARDY AND CAFFARELLI-KOHN-NIRENBERG INEQUALITIES WITH
NONRADIAL WEIGHTS*

We study the Hardy type inequalities and Cafarelli-Kohn-Nirenberg type inequalities with Dunkl weight.

Huỳnh Thanh Toàn

*SOLITON AMPLITUDE DYNAMICS OF PERTURBED NONLINEAR
SCHRÖDINGER EQUATIONS*

In this talk, we present the impact of weak nonlinear loss on the amplitude dynamics of solitons propagating in optical media described by the nonlinear Schrödinger equations in spatial dimension higher than 1. The perturbation approach is based on an extended perturbation technique for analyzing the amplitude dynamics of one-dimensional temporal solitons. The accuracy of our theoretical calculations is validated by numerical simulations with the corresponding nonlinear Schrödinger models.

Nguyễn Phúc Nghĩa, Huỳnh Văn Dũng, Lê Tuấn Khải

*ON A SYSTEM OF NONLINEAR FUNCTIONAL EQUATIONS IN A TWO-
DIMENSIONAL DOMAIN*

In this report, we examine a system of nonlinear functional equations

$$f_{\{i\}}(x) = g_{\{i\}}(x) + \sum_{\{j=1\}}^n \sum_{\{k=1\}}^m a_{\{ijk\}}[x, f_{\{j\}}(S_{\{ijk\}}(x))], \quad \forall x \in \Omega_{\{i\}}, \quad 1 \leq i \leq n, \quad \#1$$

where $\Omega_{\{i\}}$ is a compact subset of \mathbb{R}^2 , $g_{\{i\}}: \Omega_{\{i\}} \rightarrow \mathbb{R}$, $S_{\{ijk\}}: \Omega_{\{i\}} \rightarrow \Omega_{\{j\}}$, $a_{\{ijk\}}: \Omega_{\{i\}} \times \mathbb{R} \rightarrow \mathbb{R}$ (for $i, j=1, n$; and $k=1, m$) are given continuous functions, and $f_{\{i\}}: \Omega_{\{i\}} \rightarrow \mathbb{R}$ are unknown functions. Using the Banach fixed-point theorem, under some suitable conditions, we prove the existence and uniqueness of a solution $f=(f_1, \dots, f_n) \in C(\Omega_1; \mathbb{R}) \times \dots \times C(\Omega_n; \mathbb{R})$ for system (1). Moreover, the solution of system (1) is also approximated by a second-order iterative algorithm with an associated error estimate provided. In the case where $\Omega_{\{i\}} = \Omega = \{x=(x_1, x_2): |x_1| + |x_2| \leq 1\}$ for $i=1, \dots, n$, $a_{\{ijk\}}[x, y]$ is linear in the variable y , $S_{\{ijk\}}(x) = B^{\{ijk\}}x + c^{\{ijk\}}$ (with $c^{\{ijk\}} \in \mathbb{R}^2$ and $B^{\{ijk\}}$ being a real 2×2 matrix), and $g=(g_1, \dots, g_n) \in C(\Omega; \mathbb{R}^n)$, the report

shows that the solution f of system (1) is also approximated by a sequence of polynomials that converge uniformly.

Keywords: System of nonlinear functional equations; Second-order iterative algorithm; Sequence of polynomials that converge uniformly.

Võ Anh Khôi, Lê Thị Phương Ngọc

*PROPERTIES OF SOLUTIONS TO THE NEUMANN-DIRICHLET
PROBLEM FOR A NONLINEAR POROUS ELASTIC SYSTEM WITH
VISCOUS AND STRONGLY DECAYING TERMS*

This report investigates the Neumann-Dirichlet problem for a system of two nonlinear viscoelastic wave equations, where a strongly decaying term appears in one of the equations. First, using the Faedo-Galerkin approximation method, along with a priori estimates and weak convergence techniques based on compactness, we obtain results on the existence and uniqueness of weak solutions to the problem. Next, under suitable assumptions, the problem is shown to have global weak solutions and to exhibit generalized decay as $t \rightarrow +\infty$. Finally, we provide sufficient conditions under which the problem does not have a global weak solution, leading to finite-time blow-up. Furthermore, an upper bound for the blow-up time is also established.

Keywords: Neumann-Dirichlet problem; Nonlinear porous elastic system; Local existence, Global existence, General decay; Blow up in finite time.

Trần Nguyên Khang, Nguyễn Tuấn Tài, Lê Thị Phương Ngọc

*A MINOR GENERALIZATION OF A NONLINEAR FUNCTIONAL
INTEGRAL EQUATION*

This report is dedicated to the study of a more general nonlinear functional integral equation compared to [1](Turkish J. Math. 45 (3) (2021) 1386-1406). The results obtained in [1] still hold for the equation under consideration, including: (i) Unique existence of solutions; (ii) The solution set is non-empty and compact; (iii) The second-order iterative method converges; (iv) Smooth dependence of the solution on the data. Keywords: Nonlinear functional-integral equation; Converges quadratically; Smooth of solution.

[1] Nguyen Dat Thuc, Le Thi Phuong Ngoc, Nguyen Thanh Long, Solvability, stability, smoothness and compactness of the set of solutions for a nonlinear functional integral equation, Turkish Journal of Mathematics, 45 (3)(2021) 1386-1406.

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*FREQUENCY SHIFT INDUCED BY SOLITON INTERACTION IN
NONLINEAR WAVEGUIDES WITH A GENERAL NONLINEAR
DAMPING*

We investigate the impact of nonlinear damping on the frequency of solitons in a fast soliton interaction under the framework of perturbed nonlinear Schrödinger (NLS) equation with a nonlinear damping of a general order $(2m+1)$. We extend previous studies on collision-induced frequency shift with $m=1$ and derive an analytic expression for the frequency shift in a complete high-speed two-soliton collision in the presence of weak nonlinear losses for $m \geq 1$. The expression for the collision-induced frequency shift is in order of $\mathcal{O}(\frac{\epsilon_{2m+1}}{\beta^2})$ and is proportional to a polynomial of degree $(2m+1)$ in terms of the soliton amplitudes. The theoretical analysis is validated by numerical simulations.

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*THE EXISTENCE, BLOW-UP, AND GENERAL DECAY OF SOLUTIONS
TO A ROBIN PROBLEM FOR A VISCOUS ELASTIC WAVE EQUATION
WITH A LOGARITHMIC NONLINEAR SOURCE*

In this report, we investigate a Robin problem for a viscous elastic wave equation with a logarithmic nonlinear source. First, we present two theorems on the local existence of solutions. Next, under suitable conditions, we provide a sufficient condition to ensure the global existence and general decay of weak solutions. Finally, we establish several sufficient conditions under which any weak solution with negative initial energy will blow up in finite time.

Keywords: Robin problem, Local existence, Global existence, General decay, Blow up in finite time.