





ACADEMIA DE STUDII ECONOMICE Facultatea de Cibernetică, Statistică și Informatică Economică

UNIVERSITATEA BUCUREȘTI Facultatea de Matematică și Informatică ACADEMIA ROMÂNĂ Institutul de Statistică Matematică și Matematică Aplicată "Gheorghe Mihoc – Caius Iacob"

A 14-a CONFERINȚĂ A SOCIETĂȚII DE PROBABILITĂȚI ȘI STATISTICĂ DIN ROMÂNIA

ACADEMIA DE STUDII ECONOMICE BUCUREȘTI

Facultatea de Cibernetică, Statistică și Informatică Economică Catedra de Matematică

Vineri 29 aprilie 2011

Comitetul Știintific

Comitetul local de organizare

Acad. Marius Iosifescu (președinte) Acad. Ioan Cuculescu Mioara Buiculescu Monica Dumitrescu Denis Enăchescu Eugen Păltănea Vasile Preda Romică Trandafir Constantin Tudor Gheorghită Zbăganu Alexandru Agapie Luiza Bădin Silvia Dedu Bogdan Iftimie Iulian Mircea Aida Toma Maria Tudor (președinte) Ovidiu Vegheș

PROGRAMUL CONFERINȚEI SPSR 2011

Secțiuni:

- 1. Probabilități și Procese Stocastice
- 2. Statistică
- 3. Optimizări, Matematici Financiare, Actuariat

Vineri 29 aprilie 2011

Sala 2416

9:00 –9:30 Adunare generală a SPSR Ordinea de zi: raport financiar, diverse. 9:30 – 10:00 Pauză 10:00 – 19:00 Comunicări pe secțiuni

19:00 – 21:00 Cină festivă (Casa Universitarilor)

COMUNICĂRI PE SECȚIUNI Vineri 29 aprilie

Sectia Probabilităti și Procese Stocastice (Sala 2416)

Conduce: Ioan Cuculescu 10:00 – 10:20 Udrea Păun (ISMMA) **Ergodicity coefficients: applications to approximate computation**

10:20 – 10:40 Aurel Spataru (ISMMA) Improved convergence rates for tail probabilities for sums of i.i.d. Banach space valued random vectors

10:40 – 11:00 Munteanu Bogdan Gheorghe (Academia Fortelor Aeriene "Henri Coanda", Brasov) **On limit theorems for the fractional part of the random variables**

11:00 – 11:20 Corina Grosu (Universitatea Politehnica Bucuresti) **Approximations of Brownian motion on time scales**

11:20 – 11:40 Negrea Romeo (Universitatea Politehnica Timisoara) On the Existence and Uniqueness of Solutions for a class of FBSDE

11:40 – 12:00 Radulescu Marius (ISMMA) A generalized Dobrushin ergodicity coefficient in the framework of Banach spaces

12:00 - 13:20 - Pauză

Conduce: Eugen Păltănea

13 :20 – 13 :40 Vlad Barbu (University of Rouen, France) **The stationary distribution of a semi-Markov chain**

13 :40 – 14 :00 Alexandru Corlan, Gheorghita Zbaganu (Spitalul Universitar, ISMMA) **On Markov chains with random time dependence**

14 :00 – 14 :20 Agapie Alexandru (ASE Bucuresti) Stochastic Modeling of Continuous Evolutionary Algorithms

14 :20 – 14 :40 Raluca Vernic, Daniela Ungureanu (Univ. Ovidius Constanta) A fuzzy approach to the ruin problem

14 :40 – 15 :00 Amarioarei Alexandru (Universitatea Lille (Franta)) **The Markov chain imbedding technique. Application to scan statistics**

15 :00 - 15 : 20 Pauză

Conduce: Constantin Tudor

15 :20 – 15 :40 Mariana Sibiceanu (ISMMA)I On the rate function of the Large Deviation Principle for empirical measures associated with an ergodic mixing Markov chain 15 :40 – 16 :00 Marinela Marinescu (ASE and IMAR, Bucuresti) A nonlinear filtering problem involving non-smooth functionals

16 :00 – 16 :20 Bogdan Iftimie (Academia de Studii Economice Bucuresti) Un rezultat de existenta si reprezentare a solutiei unei ecuatii diferentiale cu derivate partiale stocastice neliniare

16 :20 – 16 :40 Mihai Pascu (Universitatea Transilvania din Brasov) **A new type of uniqueness for SDE**

16:40-17:00 Pauză

Conduce: Ioan Cuculescu

17 :00 – 17 :20 Eugen Paltanea (Universitatea Transilvania din Brasov) Recent results in stochastic comparison

17 :20 – 17 :40 Liana Manu Iosifescu (ASE Bucuresti) A Singular Random System with Complete Connections

17 :40 – 18 :00 Valentin Ionescu (ISMMA) **Produsul conditionat-boolean amalgamat de nuclee Markov cuantice**

18 :00 – 18 :20 Valentin Ionescu (ISMMA) Produse conditional-Booleene amalgamate de spatii de probabilitate cuantice cu valori operatori 18:20 – 18:40
George Haiman (Université de Lille 1)
1-dependent stationary sequences for some given joint distributions of two consecutive random variables

Sectia Statistică (Sala 2623)

Conduce: Monica Dumitrescu

10:00 – 10:20 Valentin Patilea (Ensai (France)) Adaptive Estimation of VAR with Time-Varying Variance : Application to Testing Linear Causality in Mean and VAR Order

10:20 – 10:40 : Aida Toma (ASE Bucuresti si ISMMA) Decomposable pseudodistances and applications in continuous families

10:40 – 11:00: Stefan V. Stefanescu (Universitatea Bucuresti) About a new indicator for measuring the poverty

11:00 – 11:20: Romica Trandafir (Universitatea Tehnica de Constructii Bucuresti) **Monte Carlo Simulation of Human Influenza's Spreading**

11:20 – 11:40 Daniel Ciuiu (Universitatea Tehnica de Constructii, Bucuresti; Institutul de Prognoza Economica) Copulas having zero-isoline and economic applications

11:40 – 12:00 Denis Enachescu, Vinicius da Silva Almendra(Univ. Bucuresti) Eliciting fraud cases in online auction sites through statistical techniques

12:00 - 13:20 - Pauză

Conduce: Romica Trandafir

13 :20 – 13 :40 Vinicius da Silva Almendra, Bianca Roman(Univ. Bucuresti) Predicting fraudulent behavior in online auction sites using exploratory data analysis

13 :40 – 14 :00 Marius Giuclea, Ciprian Popescu (ASE Bucuresti) **On fuzzy regression**

14 :00 – 14 :20 Luiza Badin, Cinzia Daraio, Leopold Simar (ASE Bucuresti si ISMMA) Assessing the Impact of Environmental Factors in a Nonparametric Production Model 14 :20 – 14 :40 Gabriela Beganu (ASE) On the existence of the best quadratic unbiased estimators of covariance components in linear models with multivariate random effects

14 :40 – 15 :00 Cristian Neculaescu (ASE) **Open Source Software for Statistics**

15 :00 - 15 : 20 Pauză

Conduce: Denis Enachescu 15 :20 – 15 :40

Cristian Neculaescu (ASE) Metric Geometry for Social Sciences

15 :40 – 16 :00 Vasile Preda, Eugenia Panaitescu (Univ. București, Univ. de medicină "Carol Davila") A new three-parameter lifetime distribution

16 :00 – 16 :20 Mariana Popa (University of Bucharest) Estimation si prediction from modified exponential distribution based on record value

16 :20 – 16 :40 Clim Adriana (Universitatea Bucuresti) Some results from noncommutative information theory

16:40 - 17:00

Voicu Boșcaiu (ISMMA) Practices in exploratory factor analysis selection of variables

17:00 – 17:20 Victor Ursianu, Radu Ursianu, Emiliana Ursianu (UPB, UPB, ISMMA) Bayesian Networks to predict Software Quality

Sectia Matematici financiare si Optimizări (Sala 2710)

Conduce: Ioan M. Stancu-Minasian

10:00 – 10:20 Mihalcea Toni (Universitatea Bucuresti) Second order optimality conditions and duality in multiobjective programming

10:20 – 10:40 Vasile Preda, Cristian Niculescu (Universitatea Bucuresti) **Maximizing the disorder with certain grade correlation coefficients**

10:40 – 11:00 Ovidiu Veghes (ASE Bucuresti) Asupra solutiilor jocurilor cooperative

11:00 – 11:20
Costel Bălcău, Vasile Preda (Universitatea din Pitesti, Universitatea Bucuresti)
Partial weighted entropic perturbation for linear and quadratic programming

11:20 – 11:40
Anton Batatorescu, Iulian Antonescu (Univ. Bucuresti, Academia Navala "Mircea cel Bătrân" Constanta)

Approximate Convexity in Multiobjective Programming

11:40 – 12:00 Monica Patriche (Universitatea din Bucuresti) Approximation methods in equilibrium theory

12:00 - 13:20 - Pauză

Conduce: Vasile Preda

13 :20 – 13 :40 Diana-Elena Stanciu (Universitatea Bucuresti) A Lagrangian type optimality condition for vector variational inequality

13 :40 – 14 :00 Cristina Pripoae (A.S.E. Bucuresti) Rezultate recente privind convexitatea functiilor pe varietati diferentiabile

14 :00 – 14 :20 Ioan M. Stancu-Minasian, Narcisa Teosorescu, Andreea Madalina Stancu **Metode de prox-regularizare pentru programarea fractionara generalizata**

14 :20 – 14 :40 Letiția Velcescu (Univ. Bucuresști) **On advanced databases with uncertain information**

14:40-15:00

Ciprian Popescu, Cristinca Fulga (ASE) Portfolio optimization using possibilistic methods 15 :00 - 15 : 20 Pauză

Conduce: Gheorghita Zbaganu

15 :20 – 15 :40 Serban Florentin (ASE Bucuresti) **Plasamentul optim in active financiare**

15 :40 – 16 :00 Iulian Mircea, Mihaela Covrig (ASE Bucuresti) **Modele de risc și strategii de investire**

16 :00 – 16 :20 Mihaela Covrig, Daniela Todose, Iulian Mircea (ASE Bucuresti) Asupra unor modele matematice privind mortalitatea populației

16:20 – 16:40 Silvia Dedu, Cristinca Fulga (ASE Bucuresti) Mean-VaR portfolio optimization with a hybrid HC-PCA approach to prior stock selection

16 :40 - 17 :00 Pauză

Conduce: Iulian Mircea

17 :00 – 17 :20 Ana Raducan, Stefan Cruceanu(ISMMA) **Compound sums in insurance theory**

17 :20 – 17 :40 Roxana Ciumara , Vasile Preda (ASE / Universitatea Bucuresti) **On optimal reinsurance programs**

REZUMATE

1. Agapie Alexandru (ASE Bucuresti)

Stochastic Modeling of Continuous Evolutionary Algorithms

Evolutionary algorithms acting on continuous space require a more sophisticated modeling than their discrete counterparts. Sharing with classical theory of evolution strategies only the interest for expected onestep progress, the proposed modeling is based on stochastic renewal processes. The new paradigm allows for global convergence results, as well as first hitting time computation for particular algorithms on particular fitness functions.

2. Amarioarei Alexandru (Université Lille Nord de France)

The Markov chain imbedding technique. Application to scan statistics

We will describe the Markov chain imbedding technique, a method for computing exact distribution of runs and patterns in a sequence of mvalued i.i.d. or Markov-dependent random variables. We will derive the distribution of the number of occurrences of a given pattern (simple or compound) as well as the distribution of the waiting time. Particular patterns (Bernoulli trials) yield to the exact distribution of the uni-variate discrete unconditional scan statistics for Bernoulli models. We will give numerical results and compare several models.

3. Luiza Badin, Cinzia Daraio, Leopold Simar (ASE Bucuresti, ISMMA, Academia Romana)

Assessing the Impact of Environmental Factors in a Nonparametric Production Model

The measurement of technical efficiency of decision making units is useful for making comparisons and informing managers and policy makers on existing differentials and potential improvements across a sample of analyzed units. The step further is to relate the obtained efficiency estimates to some external or environmental variables which may influence the production process and hence, affect the performance evaluation and explain the efficiency differentials. Conditional efficiency measures including conditional FDH, conditional DEA, conditional order-m and conditional order-alpha became rapidly a useful tool to the impact of external-environmental factors investigate on the performance of Decision Making Units in a nonparametric framework. In this paper, we clarify what can be learned by analyzing these conditional efficiency scores, showing that the impact of these factors on the production process can have different facets: impact on the attainable set in the input × output space, and/or impact on the distribution of the inefficiency scores. We suggest a procedure allowing to make local inference on the impact of Z on the process. Using the optimal bandwidth selection procedure proposed in Badin et al. (2010) we provide confidence intervals for the local impact of Z by adapting the subsampling ideas from Simar and Wilson (2010).

4. Vlad Barbu (University of Rouen, France)

The stationary distribution of a semi-Markov chain

This talk is concerned with the estimation of the stationary distribution of a discrete-time semi-Markov process. After briefly presenting the discrete-time semi-Markov setting, we propose an estimator of the associated stationary distribution. The main results concern the asymptotic properties of this estimator, as the sample size becomes large.

5. Costel Bălcău, Vasile Preda (Universitatea din Pitesti, Universitatea Bucuresti)

11

Partial weighted entropic perturbation for linear and quadratic programming

We present a common extension of partial entropic perturbation and weighted entropic perturbation methods for epsilon-optimal solving of standard linear or quadratic programming problems.

6. Anton Bătătorescu, Iulian Antonescu (Universitatea din Bucuresti, Academia Navala "Mircea cel Bătrân" Constanta)

Approximate Convexity in Multiobjective Programming

We define the classes of approximate pseudo/quasi-convex functions of type I and II and give some examples to show the non emptiness of these classes of functions, which enlarge the existing classical notions of pseudo-convexity and quasi-convexity. Using these functions, we establish sufficient optimality conditions for the quasi efficient solutions of a multiobjective programming problem.

7. Gabriela Beganu (Academia de Studii Economice)

On the existence of the best quadratic unbiased estimators of covariance components in linear models with multivariate random effects

The purpose of this paper is to prove that the best quadratic estimators (BQUE) of the covariance components of the rancom matrix Y exist in a linear mixed model iff the Gauss-Markov estimators of the expected mean exist in a linear model built for the random matrix (vecY')(vecY')'. The finite dimensional Hilbert spaces corresponding to the two linear models are used in order to show this equivalence, which offers a more convenient procedure to verify the existence of the BQUE of covariance components.

8. Voicu Boscaiu (ISMMA)

Practices in exploratory factor analysis: selection of variables

Exploratory factor analysis (EFA) is a well studied method, originally devoted for continuous observed variables. However it is sometimes used with dichotomous observed variables, yielding questionable, unreliable and, possible, incorrect results. In this context, we focus on the complex problem of variable selection, based on the information offered by available software packages.

9. Daniel Ciuiu (Universitatea Tehnica de Constructii, Bucuresti; Institutul de Prognoza Economica)

Copulas having zero-isoline and economic applications

In this paper we will use some types of copula that does not cover the entire unit square. We will use such copula to model the dependence between two random variables that can not be both less than given values, but each can be less than the corresponding value. This can be used to the Philips curve. Even we consider the values of inflation and unemployment or their rates, there exist $a, b \in \mathbb{R}$ such that the cloud of points around the curve, respectively around the line have empty intersection with the set $\{(U,V) \in \mathbb{R}^2 | U \le a, V \le b\}$, but it is possible to have separately $U \le a$ or $V \le b$ (this paper is suported by the Sectorial Operational Programme

Human Resources Development (SOP HRD), financed from the European Social Fund and by the Romanian Government under the contract number SOP HRD/89/1.5/S/62988).

10. Roxana Ciumara, Vasile Preda (ASE, Universitatea Bucuresti)

On optimal reinsurance programs

In this paper we tried to address the issue of finding a reinsurance optimal plan considering both proportional and non-proportional reinsurance. Different criteria are discussed based on reinsurance type and features of the portfolio for which the risk is transferred. Moreover properties of the optimum plans are derived and exemplified.

11. Adriana Clim (Universitatea Bucuresti)

Some results from noncommutative information theory

Based on studies in statistical physics Tsallis extended the entropy to some parametric type. Tsallis entropy is one of extended von Neumann entropy and Umegaki relative entropy. More, Tsallis relative operator entropy as a parametric extension of relative operator entropy has fundamental properties especially the convergence of Shannon entropy. Tsallis's generalization respects all of Gibbs criteria except the extensive character of entropy. Using Guiasu's model was introduced a new type of Tsallis entropy. Some properties of these new Tsallis relative operator entropy are investigated.

12. Alexandru Corlan, Gheorghița Zbaganu (Spitalul Universitar, Universitatea Bucuresti)

On Markov chains with random time dependence

We study, in the frame of k-order Markov Chains, some chains with random depth of memory. In the simplest case one gets the regenerative processes.

13. Mihaela Covrig, Daniela Todose, Iulian Mircea (ASE Bucuresti)

Asupra unor modele matematice privind mortalitatea populației

În această lucrare analizăm câteva modele de mortalitate și indicatori (măsuri) care evidențiază încetinirea sau accelerarea mortalității. Pe baza lor, se evaluează riscul dat de longevitate pentru un asigurător de rente viagere (sau pentru un sistem de pensii) și se formulează un model matematic de compensare cu emisiuni de straight bonduri (obligațiuni specifice).

14. Silvia Dedu, Cristinca Fulga (Academia de Studii Economice Bucuresti)

Mean-VaR portfolio optimization with a hybrid HC-PCA approach to prior stock selection

We consider the problem of a decision maker, who is concerned with the management of a single-period portfolio that consists of holdings in N risky assets and is adjusted at the beginning of the time-period. The portfolio optimization problem is solved in two steps. Principal Component Analysis and Hierarchical Clustering techniques are used to perform the stock selection phase. In the second step, the optimal portfolio is obtained using an algorithm based on a mean-VaR model (this work was supported by CNCSIS-UEFISCSU, project number 844 PNII - IDEI, code 1778/2008).

15. Denis Enachescu, Vinicius da Silva Almendra (Universitatea din Bucuresti)

Eliciting fraud cases in online auction sites through statistical techniques

Fraud committed by sellers is a recurring phenomenon at online actions sites like eBay. Although there is already some literature regarding detection and prevention of deceptive behaviors, research in this area is hindered by the little availability of fraud samples. Our goal is to develop a method to systematically and automatically elicit cases of fraudulent behavior using only information that is publicly available at online auction sites. The current work focuses on the identification of fraud clues in feedback comments through the use of statistical techniques. We extracted data from an online auction site and applied several statistical learning techniques in order to see which would be more adequate for this task.

16. Serban Florentin (ASE Bucuresti)

Plasamentul optim in active financiare

Lucrarea prezinta in prima parte a sa evolutia principalelor active financiare in ultimii ani. In continuare sunt descrise cele mai "cautate" clase de active financiare in 2010 cu ajutorul unui studiu facut pe Google Trends, iar in finalul prezentarii este evaluata evolutia acestor active in 2011, incercindu-se sa se faca o legatura cu volumele de cautare ale acestora (această lucrare a fost cofinanțată din Fondul Social European prin Programul Operational Sectorial Dezvoltarea Resurselor Umane 2007-2013, proiect numarul POSDRU/89/1.5/S/59184 "Performanță și excelență în cercetarea postdoctorala în domeniul științelor economice din România").

17. Marius Giuclea, Ciprian Popescu (Academia de Studii Economice Bucuresti)

On fuzzy regression

This paper discuss the issue of fuzzy regression. There are many approaches, which mainly differ by the type of fuzzy numbers chosen or by defining the notion of distance between two such numbers. In particular, we study a model based on trapezoidal fuzzy numbers.

18. Corina Grosu (Universitatea Politehnica Bucuresti)

Approximations of Brownian motion on time scales

The paper presents a short survey and some new results concerning the unified approach to approximations of Brownian motion on time scales, based in principal on Advances in Dynamic Equations on Time Scales, edited by M.Bohner and A.Peterson's.

19. George Haiman (Université de Lille 1)

1-dependent stationary sequences for some given joint distributions of two consecutive random variables

We provide a method to construct a 1-dependent stationary sequence provided some mixing condition on the joint distribution of two consecutive random variables. Two illustrations of computational benefits of the method are given. We obtain analytical formulas to compute the expectation and variance of the number of occurrences of a word in a sequence of letters from a finite alphabet generated by the 1-dependent model. We also obtain an approximation formula for the distribution of the longest success run in a Bernoulli sequence generated by our model.

20. Bogdan Iftimie (Academia de Studii Economice Bucuresti)

Un rezultat de existenta si reprezentare a solutiei unei ecuatii diferentiale cu derivate partiale stohastice neliniare

21. Valentin Ionescu (ISMMA)

Produse conditional-Booleene amalgamate de spatii de probabilitate cuantice cu valori operatori

Construim analoguri conditionat-booleene amalgamate ale produselor libere sau conditionat-libere amalgamate de spatii de probabilitate necomutative introduse de D. Voiculescu (si, intr-un caz scalar, de D. Avitzour, respectiv (in cazul scalar) de M. Bozejko si R. Speicher, sau de M. Bozejko, M. Leinert si R. Speicher; generalizand astfel, in cadrul mediilor conditionate, produsul boolean de stari al lui Bozejko. Prin aceste obiecte, introducem un nou tip de independenta necomutativa -- independenta conditionat-booleana amalgamata -- care este fundamentala intr-o teorie corespunzatoare a probabilitatilor cuantice.

22. Valentin Ionescu (ISMMA)

Produsul conditionat-boolean amalgamat de nuclee Markov cuantice

Folosind o inegalitate de tip Kadison-Schwarz, demonstram ca produsul conditionat-boolean amalgamat de aplicatii complet-pozitive definite pe spatii de probabilitate necomutative *-algebrice operatorialvaluate este complet-pozitiv. Acest fapt este de asemenea obtinut printr-o constructie de tip Stinespring. In particular, obtinem astfel, doua noi demonstratii ale complet-pozitivitatii in cazul produsului boolean operatorial-valuat, in afara extensiei propriei noastre demonstratii directe din context C*-algebric pentru aplicatii contractive.Apoi anuntam generalizari si analoguri ale acestor rezultate spre o teorie a probabilitatilor conditionat-libere, respectiv conditionat-monotone amalgamate.

23. Liana Manu Iosifescu (ASE Bucuresti)

A Singular Random System with Complete Connections

We give a new proof of a result of Szüsz that generalizes the classical theorem of Gauss-Kuzmin- Levy. The proof makes use of an operator occurring in the theory of dependence with complete connections. The result we shall prove can be stated as follows: there exist positive constants C and q < 1 such that

$$\begin{vmatrix} m_n(k_1,k_2,x) - \frac{\ln(1+x)}{r^2 \ln 2 \prod_{p|r} \left(1 - \frac{1}{p^2}\right)} \end{vmatrix} \leq Cq^n, \\ \forall n \in N^*, 0 \leq x \leq 1, r \in N^*, 0 \leq k_1, k_2 < r, \text{ where} \\ m_n(k_1,k_2,x) = \lambda [E_n(k_1,k_2,x)], E_n(k_1,k_2,x) \text{ being the set of irrational} \\ \text{numbers } t \in [0,1] \text{ such that } q_{n-1}(t) \equiv k_1, q_{n-2}(t) \equiv k_2 \pmod{r} \cdot r \text{ is a given} \\ \text{positive integer and } q_n \text{ the dominator of the } n \text{ th convergent of the} \\ \text{continued fraction } [a_1,a_2,\ldots] \text{ defined as } [a_1,a_2,\ldots,a_n]. \end{aligned}$$

24. Marinela Marinescu (ASE and IMAR, Bucuresti)

A nonlinear filtering problem involving non-smooth functionals

An incomplete knowledge of the state $x(t), t \in [0, T]$, of a nonlinear stochastic differential system involves the conditional mean $E\left\{\varphi(x(T))|y^T\right\}$ $\varphi(x(T))$ given of the random variable past observations $y^T = \{y(s): 0 \le s \le T\}$, where $\varphi(x): \Re^n \to \Re$ is a locally Lipschitz continuous function. Using a new probability measure and a new dynamical stochastic system describing the evolution of $\{(\hat{x}_{y}(t), \xi_{y}(t)) \in \Re^{n+1}; t \in [0, T]\}$, we represent $E\{\varphi(x(T)) | y^{T}\}$ as $\hat{E}_{v}\left\{\varphi(\hat{x}_{v}(T))\right\} \exp y(T)h(\hat{x}_{v}(T)) \xi_{v}(t)$ for each continuous function $y(\cdot) \in \hat{C}([0,T]; \mathfrak{R}^d)$ with y(0) = 0.

25. Mihalcea Toni (Universitatea Bucuresti)

Second order optimality conditions and duality in multiobjective programming

In this paper we develop nonlinear multiobjective programming problem with inequality constraints. We introduce some classes of nonconvex functions and some definitions of invex and preinvex functions. Examples are given to shows relationship between them. Various second order optimality theorems are obtained.

26. Iulian Mircea, Mihaela Covrig (ASE Bucuresti)

Modele de risc și strategii de investire

În lucrare prezentăm câteva rezultate privind probabilitatea de ruinare într-un model de risc având dependență între rata primei și mărimea cererii de despăgubire. De asemenea, pentru un proces de risc modelat ca un proces Poisson compus, determinăm o strategie de investire a surplusului de capital într-un indice bursier minimizând probabilitatea de ruinare.

27. Bogdan Gheorghe Munteanu (Academia Fortelor Aeriene "Henri Coanda", Brasov)

On theorems limit for the fractional part of the random variables

Based on the stohastic approximations, the paper is meant to study the convergence in distribution of the fractional part of the random variables sum to the exponential distribution. This fact it is feasible through the Fourier-Stieltjes sequence (SFS) of the random variable.

28. Cristian Neculaescu (Academia de Studii Economice)

Open Source Software for Statistics

29. Cristian Neculaescu (Academia de Studii Economice)

Metric Geometry for Social Sciences

30. Romeo Negrea (Universitatea Politehnica Timisoara)

On the Existence and Uniqueness of Solutions for a class of FBSDE

In this paper we shall establish a new theorem on the existence and uniqueness of the adapted solution to coupled forward-backward stochastic differential equations under some weaker conditions than the Lipschitz one. The extension is based on the Athanassov's non-lipschitz condition for ordinary differential equations.

31. Eugen Paltanea (Universitatea Transilvania din Brasov)

Recent results in stochastic comparison

We will discuss a series of recent partial results about an open problem concerning the stochastic comparison of order statistics.

32. Mihai Pascu (Universitatea Transilvania din Brasov)

A new type of uniqueness for SDE

We introduce the notions of \$\varphi\$-strong solution / \$\varphi\$strong uniqueness for stochastic differential equations, which interpolate between the classical notions of strong and weak solutions / uniqueness. We present some examples of stochastic differential equations for which we show that \$\varphi\$-strong uniqueness holds, and we provide an explicit description of the solutions.

33. Valentin Patilea (Ensai - France)

Adaptive estimation of var with time-varying variance: application to testing linear causality in mean and var order

Linear Vector AutoRegressive (VAR) models where the innovations could be unconditionally heteroscedastic and serially dependent are considered. The volatility structure is deterministic and guite general, including breaks or trending variances as special cases. In this framework we propose Ordinary Least Squares (OLS), Generalized Least Squares (GLS) and Adaptive Least Squares (ALS) procedures. The GLS estimator requires the knowledge of the time-varving variance structure while in the ALS approach the unknown variance is estimated by kernel smoothing with the outer product of the OLS residuals vectors. Different bandwidths for the different cells of the time-varying variance matrix are also allowed. We derive the asymptotic distribution of the proposed estimators for the VAR model coefficients and compare their properties. In particular we show that the ALS estimator is asymptotically equivalent to the infeasible GLS estimator. This asymptotic equivalence is obtained uniformly with respect to the bandwidth(s) in a given range and hence justifies data-driven bandwidth rules. Using these results two applications are proposed. First, we build Wald tests for the linear Granger causality in mean which are adapted to VAR processes driven by errors with a non stationary volatility. It is also shown that the commonly used standard Wald test for the linear Granger causality in mean is potentially unreliable in our framework. Second, we investigate the properties of the classical portmanteau tests when the innovations are unconditionally heteroscedastic. We find that the asymptotic distributions of the OLS residual autocorrelations can be quite different from the standard chi-square asymptotic distribution. Corrected portmanteau tests which take into account changes in the volatility using data driven adjustments for the critical values are proposed. Monte Carlo experiments and real data examples illustrate the theoretical results. The talk is based on joint work with Hamdi Raïssi

34. Monica Patriche (Universitatea din Bucuresti)

Approximation methods in equilibrium theory

By using a technique of approximation, we prove new equilibrium theorems for abstract economies (Yuan's model)with conditions of nonconvexity and noncompactness. We also use the selection methods to prove fixed point theorems or equilibrium existence.

35. Udrea Păun

Ergodicity coefficients: applications to approximate computation

We use the ergodicity coefficients to the approximate computation for products of stochastic matrices and probability distributions of finite Markov chains.

36. Mariana Popa (University of Bucharest)

Estimation si prediction from modified exponential distribution based on record value

In this paper, the record values arrising from modified exponential distribution is introduced. The means, variances and covariances of upper record values are also computed. Using these moments the best linear unbiased estimates (BLUEs) for the location and scale parameters of modified exponential distribution are calculated. Finally, the confidence intervals for the location and scale parameters through Monte Carlo simulation and interval prediction for future records are constructed.

37. Ciprian Popescu, Cristinca Fulga (Academia de Studii Economice Bucuresti)

Portfolio optimization using possibilistic methods

When modeling the uncertainty for decision making and in particular for the portfolio optimization problem, possibilistic approach is a viable alternative to the use of probabilistic methods. In order to obtain an adequate quantification of uncertainty, the best results are obtained when using mixed models, in which statistical methods are combined with elements of possibility theory. In this paper, we propose and discuss such a model which uses a special type of fuzzy numbers whose properties are studied (this work was supported by CNCSIS-UEFISCSU, project number 844 PN II-IDEI, code 1778/2008).

38. Cristina Pripoae (ASE Bucuresti)

Rezultate recente privind convexitatea functiilor pe varietati diferentiabile

In aceasta lucrare, ne propunem sa raspundem la urmatoarea intrebare: in ce conditii o functie diferentiabila, neconvexa in sens clasic, poate fi considerata convexa in sens generalizat, in raport cu o conexiune liniara convenabil aleasa? Demonstram ca acest lucru este posibil pentru o familie larga de functii diferentiabile reale definite pe varietati diferentiabile, cu conditia ca aceste functii sa fie regulate sau cu toate punctele critice strict convexe. Dam contraexemple pentru a arata ca rezultatul obtinut nu poate fi imbunatatit - in general - pentru a acoperi cazurile exceptate. De asemenea, extindem caracterizarea data de Craven pentru invexitate, de la functii definite pe Rn la functii pe varietati diferentiabile si folosim acest rezultat pentru a compara convexitatea generalizata cu invexitatea. 39. Vasile Preda, Cristian Niculescu (Universitatea Bucuresti)

Maximizing the disorder with certain grade correlation coefficients

40. Vasile Preda, Eugenia Panaitescu (University of Bucharest, "Carol Davila" University of Medicine and Pharmacy)

A new three-parameter lifetime distribution

Several distributions have been proposed in the literature to model lifetime data. Adamidis and Loukas (1998) introduced the two-parameter exponential-geometric (EG) distribution with decreasing failure rate, Kus (2007), following the same idea of the EG distribution, introduced the exponential-Poisson distribution, Marshall and Olkin (1997) presented a method for adding a parameter to a family of distributions with application to the exponential and Weibull families, Adamidis et al. (2005) proposed the extended exponential-geometric (EEG) distribution which generalizes the EG distribution. We propose a new distribution family based on the ED with increasing or decreasing failure rate function. The failure rate can also be upside-down bathtub shaped. Its genesis is stated on a parameterization scheme for a survival function proposed by Marshall and Olkin (1997). We provide closed-form expressions for the density, cumulative distribution, survival and failure rate functions. The EM algorithm is used to determine the maximum likelihood estimates and the asymptotic varinces and covariances of these estimates are obtained

41. Ana Raducan, Stefan Cruceanu (ISMMA)

Compound sums in insurance theory

We present examples and results obtained for i.i.d. claims and for different types of counting processes. In particular hypothesis we establish recurrences for a compound sum based on the fact that in some cases is sufficient to know the distribution function of the number of claims on an interval of length 1, or the compound sum for such an interval.

42. Marius Radulescu (ISMMA)

A generalized Dobrushin ergodicity coefficient in the framework of Banach spaces

Let *X*, *Y*, *Z* be linear normed spaces and $Q \in L(X, Y)$. For every $A \in L(X, X)$ denote $\alpha_Q(A) = \sup\{||Ax|| : ||x|| = 1, Qx = 0\}$ and $S(Q) = \{A \in L(X, X) : QA = Q\}$. We shall call the operators of S(Q), Q-stochastic operators. $\alpha_Q(A)$ will be called the generalized Dobrushin ergodicity coefficient of the matrix A. In case that $Q=e^T$ where e is the n-dimensional vector whose components are all equal to 1, and $S_+(Q) = \{A \in L(\mathbb{R}^n, \mathbb{R}^n) : \text{all the entries of } A \text{ are non - negative and } QA = Q\}$, then S₊(Q) is the set of column stochastic matrices. We shall show that the generalized Dobrushin ergodicity coefficient defined above has analogue properties with the classical Dobrushin ergodicity coefficient. Several applications of this ergodicity coefficient to the limit of matrix powers are obtained.

43. Mariana Sibiceanu (Institutul de Statistica Matematica si Matematica Aplicata, Academia Romana)

On the rate function of the Large Deviation Principle for empirical measures associated with an ergodic mixing Markov chain

Some possible lower bounds of the rate function which controls the LDP for empirical measures associated with a mixing (in the ergodictheoretic sense) finite state Markov chain are given, also the necessary condition for a probability to nullify the rate function. It is shown that in the case of a general Polish state space the Mean Ergodic Theorem could provide some possible lower bounds of the rate function, under the assumption that the LDP is satisfied (for example, when stronger mixing conditions are assumed).

44. Aurel Spataru (ISMMA)

Improved convergence rates for tail probabilities for sums of i.i.d. Banach space valued random vectors

Let $\{X_n, n \ge 1\}$ be a sequence i.i.d. random vectors taking values in a 2-smooth separable Banach space, and set $S_n = X_1 + \ldots + X_n$. For $0 and <math>r \ge 1 \lor p$, put $f(\varepsilon) = \sum_{n\ge 1} n^{r/p-2} P(||S_n|| \ge \varepsilon n^{1/p}), \varepsilon > 0$. Jain (1975) proved that $f(|\varepsilon), \varepsilon > 0$, if and only if $E||X_1||^r < \infty$ and $EX_1 = 0$.

We strengthen this result by showing that, except for the case p = r = 1, witch is treated separately, $\int_{\delta}^{\infty} f(\varepsilon) d\varepsilon < \infty, \delta > 0$, if and only if $E ||X_1||^r < \infty$

and $EX_1 = 0$.

45. Diana-Elena Stanciu (Universitatea Bucuresti)

A Lagrangian type optimality condition for vector variational inequality

By using the general separation theory for suitable approximations of the image spaces, we get necessary optimality conditions for some Vector Variational Inequalities with G-semidifferentiable, linear affine and almost linear affine constraints. Some applications to constrained extremum problems are also outlined. 46. Ioan M. Stancu-Minasian, Narcisa Teodorescu, Andreea Madalina Stancu (ISMMA, UTCB, ISMMA)

Metode de prox-regularizare pentru programarea fractionara generalizata

Dupa cum se stie, algoritmii de tip Dinkelbach pentru rezolvarea problemelor de programare fractionara generalizata, genereaza un sir de probleme auxiliare cu o structura mai simpla decat problema originala. Problemele auxiliare contin un parametru λ . Algoritmii de tip Dinkelbach genereaza un sir de parametrii λ , convergent catre valoarea optima a problemelor de programare fractionara. Daca solutia problemei de programare fractionara nu este unica, este posibil ca solutiile problemelor auxiliare sa nu fie unice, ceea ce poate produce dificultati in rezolvarea numerica a acestor probleme. In lucrare vom prezenta o metoda de regularizare prin care se inlatura aceste dificultati.

47. Stefan Stefanescu (Universitatea Bucuresti)

About a new indicator for measuring the poverty

The classical Gini coefficient is often used in practice to measure the poverty phenomenon. In the present paper we prove that, in fact Gini's index estimates the income inequalities and it is not always adequate for measuring the poverty. For this reason a new generalization for Gini's coefficient is proposed. The good properties of this extended index are shown too.

48. Aida Toma (ASE Bucuresti and ISMMA)

Decomposable pseudodistances and applications in continuous families

General pseudodistances with decomposable structure are considered, they allowing defining minimum pseudodistance estimators,

without using nonparametric density estimators. A special class of pseudodistances indexed by $\alpha > 0$, leading for $\alpha \downarrow 0$ to the Kulback Leibler divergence, is presented in detail. Corresponding estimation criteria are developed and asymptotic properties are studied. Finally, some examples based on Monte Carlo simulations are discussed (this paper is supported by the Sectorial Operational Programme Human Resources Development (SOP HRD), financed from the European Social Fund and by the Romanian Government under the contract number SOP HRD/89/1.5/S/62988).

49. Romica Trandafir, Cornel Resteanu (Universitatea Tehnica de Constructii Bucuresti, ICI)

Monte Carlo Simulation of Human Influenza's Spreading

The paper starts from the human influenza's spreading phenomenon, as a complex of observable occurrences, and develops a stochastic process, well defined as a set of procedures that convert its initial state into a sequence of different states during the phenomenon's lifespan. It is possible making use of Monte Carlo Simulation on a Stochastic Discrete Event System. This system is completely described in terms of: entities, sequential states, states' transition table, sets of input / output events, internal / external transition function, events / time advance function, input / output parameters. The simulation can be made considering diverse contagious schema and sanitary policy. Finally, some information about the software in the field is given.

50. Victor Ursianu, Radu Ursianu, Emiliana Ursianu (UPB, UPB, ISMMA)

Bayesian Networks to predict Software Quality

Some models and methods to calculating software quality with a Bayesian Natworks {BNs} are proposed using quality factors or metrics for incomplete and uncertain data.

51. Ovidiu Veghes (ASE Bucuresti)

Asupra solutiilor jocurilor cooperative

Se vor trece in revista cateva idei din teoria implementarii.

52. Letitia Velcescu (Universitatea din Bucuresti)

On advanced databases with uncertain information

Advanced databases allow to store and manage large volumes of data, coping with the rapidly increasing amount of information needed in most of the research, medical, economic or industrial fields. On the other side, the specific data that some domains might provide can be uncertain or may contain errors. In such databases, the problem is still both to provide a good management, the possibility to retrieve the requested information and to appropriately support the decision making, even if one works with uncertain data. In this context, the concept of random database has become important. The paper will present the formalization of the relational operations and some results of this domain. Also, some particular cases, in which databases contain columns of different probability distributions, will described (this work was supported by the strategic be grant POSDRU/89/1.5/S/58852. Project "Postdoctoral programme for training scientific researchers" cofinanced by the European Social Found within the Sectorial Operational Program Human Resources Development 2007 -2013).

53. Raluca Vernic, Daniela Ungureanu (Universitatea Ovidius Constanta)

A fuzzy approach to the ruin problem

The ruin problem is one of the most important subjects of actuarial mathematics, traditionally approached by probability theory. In this work,

we suggest a fuzzy alternative approach, based on the uncertainty of the information. More precisely, we consider a discrete time model for the cash flow of an insurance portfolio/business in which the net losses and return rates are fuzzy numbers. We evaluate the fuzzy present value of the corresponding wealth and impose ruin restrictions that yields some conditions for the involved parameters.

54. Almendra Vinicius da Silva, Bianca Roman(Universitatea din Bucuresti)

Predicting fraudulent behavior in online auction sites using exploratory data analysis

Fraud committed by sellers is a recurring phenomenon at online actions sites like eBay. One of the most important goals in fraud prevention is to identify possible fraudsters early enough, in order to avoid customer damage. Our objective is to develop a method to predict occurrence of fraudulent behavior using only information that is publicly available at online auction sites. In this work we present an approach based on longitudinal data collection and Exploratory Data Analysis techniques to identify fraudsters before they strike.