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BOOK REVIEWS *RECENZII*

WIJERS, B.J., *Nonparametric estimation for a windowed line–segment process,* CWI Tract, 121, Amsterdam, 1997, 152p., ISBN 90 6196 474 1.

În această monografie sunt cercetate aşa numitele "windowed line–segment process", care modelează unele fenomene geologice, unele fenomene generate de stocarea deşurile nucleare şi o serie de fenomene generate de perioadele de spitalizare a bolnavilor într-un spital. Aceste procese modelează situaţii de tipul următor: pe un ecran (o fereastră) se observă o parte din segmentele de dreaptă de pe o suprafţă plană, aşzată în mod arbitrar, caraterizate prin lungime, poziţie şi direcţie. Procesul determinat de segmentele de pe ecran este numit proces bidimensional de segmente. Observaţiile asupra segmentelor de pe ecran sunt folosite pentru construcţia unui estimator neparametric de verosimilitate maximă pentu funcţia de distribuţie a lungimii segmentelor (se presupune că lungimile şi direcţiile sunt independente).

Lucrarea este formată din patru capitole. În primul capitol se face o introduce formală asupra proceselor unidimensionale şi bidimensionale de segmente. Se introduce un estimator neparametric de verosimilitate maximă în cazul unidimensional, iar în cazul bidimensional pentru ecrane în formă de cerc şi pentru cazul unui ecran care este o mulţime convexă arbitrară. În al doilea capitol se studiază consistenţa estimatorilor definiţi în capitolul precedent, iar în capitolul al treilea se demonstrează normalitatea asimptotică a acestori estimatori, folosind o identitate a lui Van der Laan (1993) pentru modelele "liniar– convexe". În capitolul al patrulea sunt prezentate câteva probleme deschise interesante. Lucrarea conţine o bibliografie formată din 40 titluri de articole şi lucrări de ultimă oră dedicate temei cărţii. Lucrarea se adresează practicienilor şi în mod deosebit cercetătorilor din domeniul statisticii matematice.

C. Amihăesei

RICHARD NOSS and CELIA HOYLES, *Windows on Mathematical Meanings, Learning Cultures and Computers,* Mathematisc Educations Library, vol.17, Kluwer Academic Publisher, Dordrecht/Boston/London, 1996, VIII+275p.

The authors wrote this book based on the idea that the realm of social and cultural life, as much as the quality of life of the individual, is improved by the presence of mathematical windows to understand and interpreted the world, and to change it.

Their central heuristic is to take the idea of the computer as a window on knowledge, on the conceptions, attitudes and beliefs of tea process. The authors' focus of interest it on what the computer makes for mathematical meaning–making outlining the mediating role of the linguistic and notational frameworks the computer provides. The computer's presence within educational discourse opens a futher, epistemological window on mathematical learning and offers us a particular means ti apot a modern approach, namely the study of thimking–change which demands that we denote at least equal attention to what is to learned as well as the meanings the learner draws from the educational experience.

The authors' concerns in this book range over the cognitive, methodological, epistemological and cultural discussing how the computer could aid in the process of making mathematics more accessible, more meaningful and more learnable.

The material was divided in the chapters intitled: Visions of the mathematical, Laying the Foudations, Tools and technologies, Ratioworld, Webs and situated abstractions, Beyond the individual learner, Cultures and change, A window on teachers, A window on schools, Re–visioning mathematical meanings.

Rodica Brânzei

CRESSIE, NOEL A.C., *Statistics for spatial data ,* JOHN WILLEY & SONS, INC, 1991,

In this book the author has presented Statistics for spatial data in a unified form. The author has studied an enormous volume of literature on this subject and has tried to make coerent this exposure. The multitude of unconnected subject areas is ? into a cohesive approach to analysis of spatial data. Chapter 1 provides an overview of the approach of the enormous diversity of problems involving spatial data, from the microscopic to the

astronomic.

The book attempts to give a ? completecoverage of each three parts, dealing with geostatistical dat, lattice data and points patterns. Thus the subject areas are classified according to the type of encountered observations, reflecting that the roots of statistical science are in data.

This book is the first monography on this subject and it present Statistic for spatial data to scientits and engineers.

T. Hăvîrneanu

AEBISCHER, B., BORER, M., KL̈IN, M., LEUNBERGER, Ch. and REIMANN, H.M., *Symplectic Geometry, An Introduction based on the Seminar in Bern, 1992,* Progress in Mathemtics, PM 124, Birkhaüser Verlag Basel, Berlin, Boston, 1994, XII+237p., ISBN 3-7643-5064-4

This book gives a solid introduction to the recent developments in symplectic and contact geometry.

The theory of J–holomorphic curves is one of the new techniques which has recently revolutionized the study of symplectic geometry giving the Gromov–Witten invariants.

This discovery has establish a deep between classical geometry and quantum field theory.

Using the pseud–holomorphic curves of Gromov and Witten' ideas about Morse Theory, Floer construct approiate homology groups, called Floer groups.

A Hamiltonian vector field on a symplectic manifold has zeros at the critical points of the corresponding Hamiltonian function.

This fact implies the usual Morse inequalities.

The Arnold conjectures assert that similar inequalities hold for the fixed points of symplectic diffeomorphism.

Floer proves the Arnold conjecture and openes up completely new territory; this book is dedicated to study this.

Chapter 1 gives a review of the symplectic group $Sp(n, R)$, symplectic manifolds, Hamiltonian systems and Maslov index.

Chapter 2 contains a proof of the Darboux theorem, important examples of symplectic manifolds, theory of coadjoint orbits and Konstant–Souriau theorem.

Chapter 3 is devoted to the theory of generating functions which lead to a symplectic invariant, called the Viterbo Capacity.

In Chapter 4 the notion of symplectic capacity is introduced and used to proof Gromov's squeezing theorem and some rigidity results.

In Chapter 5 is introduced Floer's famous homology and Floer's proof of the Arnold conjecture.

Chapter 6 is an introduction to pseudoholomorphic curves in a symplectic manifold and a self–contained presenttion of the fundamental construction of the moduli space of closed holomorphic curves.

In Chapter 7 is given from a more geometrical point of view a proof of the compactness theorem using the deformations of Riemaniann surfaces.

Chapter 8 is devoted to study topologicl invariants of two– dimensional embedded in 3–dimensional contact or 4–dimensional symplectic manifolds and Eliashberg's classification results.

Gh. Ionesei

DAJUN GUO, LAKSMIKANTAM, V., XINZHI LIU, *Nonlinear integral equations in abstract spaces,* Mathematic and its applications, vol.373, Kluwer Academic Publishers, Dordrecht, Boston, London, 1996, VIII+341p., ISBN 0-7923-4144-9.

DAJUN GUO, LAKSMIKANTAM, V. and XINZHI LIU, *Nonlinear Integral Equations in Abstract Spaces,* Kluwer, Dordrecht, 1996, VIII+341 p., ISBN 0792341449

The theory of the nonlinear integral equations in abstract spaces is a fast growing field with important applications to a number of areas of analysis as well as to other branches of science. This book is a comprehensive treatment of the nonlinear integral equations in abstract spaces.

The forst chapter one introduce some basic results in analysis which will be used in the later chapters. The first section of this chapter deals with the mean value theorems. In the second section is introduced the concept of measure of noncompactness and are given some fixed points theorems. In the third section are considered the comparison theorems for Volterra integral equations and ordinary differential equations. The fourth section deals with the linear integral equations in Banach spaces. This section geives some existence and uniqueness theorems of solutions in spaces C and L^2 for both equations of Fredholm type and Volterra type. In the last section are dicussed the rlations between the differential and integral equations in Banach spaces.

The second chapter, wich is a main part of this book, deals with the nonlinear integral equations in Banach spaces. Using general fixed point

theorems and fixed points index theory for strict set contractions, in this portion are studied the existence of positive solutoins, the number of positive solutions and structure of eigenvalues and eigenfunctions for equations of Fredholm type. The second section deals with equations of Volterra type. Theorems of existence and uniqueness of global solutions are obtained, and comparison and existence theorems on local extremal solutions are given. The third section is devoted to the existence and uniqueness of L^p solutions for equations of Hammerstein type. Using the Tonelli approximate sequence, this part investigates the existence and the uniqueness of L^p local an dL^p global solutions for equation of Volterra–Hammerstein type. Finally, inthe last section is considered a nonlinear equation modelling infections desease. Employing the fixed point to index theory is obtained a result on the existence of two nontrivial and nonnegative continuous and periodic solutions.

The third chapter is devoted to the nonlinear integro–differential equations in Banach spaces including first and second order equations. This part presents the existence thorems of maximal and minimal solutions for both equations of Volterra type and mixed type, by means of upper and lower solutions. For the equations of Volterra type are established a comparison result, and then, is obtained the existence of extremal solutions by employing the method of upper and lower solutions and iterative monotone techenique. Also, in this chapter are discussed the second order equations. Using the fixed point theory and the fixed point index theory, are obtained some results on the existence of nonnegative solutions, including the existence of multiple nonnegative solutions, for such equations. Some applications to the third order integro–differential equations are given. For the sake illustrating to the obtained results, are given several examples on both finite and infinite systems of scalar nonlinear integro– differential equations.

The fourth chapter is devoted to the nonlinear impulsive integral equations in Banach spaces and their applications to the nonlinear impulsive differential equations in Banach spaces. For the impulsive equations of Volterra type are presented an aexistence theorem of maximal and minimal solution. Using the fixed point index theory and the cone compression and expansion theorem for strict set contractions, is obtained the existence of two positive solutions of impulsive equations of Fredholm type. Also, are dicussed the initial value problems for nonlinear first order impulsive integro–differential equations of Volterra type and mixed type by means of the lower and upper solutions and monotone iterative technique.

Radu Mitric

SAPORTA, G., *Probabilités, analyse des données et statistique,* Éditions Technip, Paris, 1990, XXVI+493 p., ISBN 2-7108-0565-0

Această carte constituie un bun manual de statistică aplicată. Apariţia şi extraordinara dezvoltare a clculatorului au permis accesul practicienilor la tehnicile de Analiza datelor. Cele 18 capitole ale cărţii sunt grupate în trei părţi: Instrumente probabilistice (Cap.1-Cap.5), Statistică descriptivă (Cap.6-Cap.12) şi Statistică inferenţială (Cap.13-Cap,18). În prima parte sunt prezentate noţiunile şi rezultatele fundamentale referitoare la probabilităţi şi procese aleatoare. A doua parte conţine descrierea unidimensională şi multidimensonală a datelor numerice, analiza în componente pricipale, analiza economică, metode factoriale, analiza corespondeţelor multiple, metode de clasificare. Partea a treia se referă la legile probabiliste ale statisticilor uzuale, estimarea punctuală şi confidenţială, teste statistice, analiza dispersonală, regresia simplă şi multiplă, analiza discriminant. Cartea mai conţine 5 anexe, o bibliografie şi un indice de nume şi noţiuni. Pentru parcurgerea cărţii sunt necesare cunoştinţe de algebră liniară, probabilităţi şi statistică matematică. Prin coţinutul ei, cartea se adresează tuturor cărora le este necesară: Analiza datelor (economişti, sociologic, psihologi, medici, informaticieni).

Elena Nenciu

VERVAAT, W. and HOLWERDA, H.:(Editors), *Probability and lattices. Centrum voor Wiskunde en Informatica,* CWI Tract, vol.110, Amsterdam, 1997, VI+154 p., ISBN 90-6196-4441-5, Dfl.40.

Volumul reuneşte un număr de 6 lucrări, revizuite, corectate şi comentate, aparţinând domeniului Probabilităţi pe structuri algebrice şi topologice, lucrări publicate între 1988-1993. Lista cu titlurile lucrărilor, numele autorilor şi anii apariţiie este: W.Vervaat - Funcţii aleatoare semicontinue superior şi procese extremale (1988); T. Norberg - Asupra convergenţei măsurilor de probabilitate pe mulţimi continue parţial ordonate (1990); G.Gevitse - Funcţii semicontinue cu valori într-o latice (1985); W. Vervaat - Spaţii cu intersecţie semicontinuă superior (1988); T. Norberg, W. Vervaat - Capacităţi pe spaţii non- Hansdorff (1989); H. Holwerda - O notă asupra compactităţii Fell şîepicompactităţii (1993).

Elena Nenciu