BRÅKET

Information om seminarier och högre undervisning i matematiska ämnen i Stockholmsområdet

NR 20 **FREDAGEN DEN 18 MAJ 2001**

BRÅKET

Veckobladet från Institutionen för matematik vid Kungl Tekniska Högskolan och Matematiska institutionen vid Stockholms universitet

Redaktör: Gunnar Karlsson

Telefon: 08-790 84 79

Adress för e-post: gunnark@math.kth.se

Bråket på Internet: http://www.math.kth.se/braaket.html eller http://www.math.kth.se/braket/

Postadress:
Red. för Bråket
Institutionen för matematik
KTH
100 44 Stockholm

- - - - - - -

Sista manustid för nästa nummer: Tisdagen den 22 maj kl. 13.00.

Disputation i optimeringslära och systemteori

Anders Dahlén disputerar vid KTH på avhandlingen *Identification of stochastic systems: Subspace methods and covariance extension* den 6 juni kl. 10.00. Se sidan 6.

Nästa nummer av Bråket

utkommer onsdagen den 23 maj. Material måste vara red. tillhanda senast den 22 maj kl. 13.00.

SEMINARIER

Fr 05–18 kl. 9.00–10.00. Kollokvium i fysik — docentföreläsning. Dr Jan Wallenius, Kärn- och reaktorfysik, KTH: *Transmutation of nuclear waste — from basic physics to commercial application.* Sal F 01, Fysiska institutionen, KTH, Lindstedtsvägen 24, b.v. Se sidan 5.

Fr 05–18 kl. 11.00–12.00. Optimization and Systems Theory Seminar. Claudio Altafini, Optimeringslära och systemteori, KTH: *Modelling and control of redundant robotic chains on Riemannian manifolds.* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se Bråket nr 19 sidan 5.

Fr 05–18 kl. 16.15. Seminar in Mathematical Physics. Edwin Langmann, KTH: *Noncommutative gauge theory models, dimensional reduction and gravity.* Seminarierummet, Teoretisk fysik, KTH, Osquldas väg 6, plan 4. Se sidan 5.

Må 05–21 kl. 13.15. Algebraseminarium. Professor Michiel A. Hazewinkel, CWI, Amsterdam: *Witt vectors, symmetric functions, noncommutative symmetric functions and quasi-symmetric functions. Their interrelations and similarities.* Rum 306, hus 6, Matematiska institutionen, SU, Kräftriket. Se sidan 3.

Professor Hazewinkel är fakultetsopponent vid Claudio Altafinis disputation. Se Bråket nr 19 sidan 9.

Fortsättning på nästa sida.

Disputation i optimeringslära och systemteori

Claudio Altafini disputerar på avhandlingen *Geometric control methods for nonlinear systems and robotic applications* den 23 maj kl. 13.00 i Kollegiesalen, Administrationsbyggnaden, KTH, Valhallavägen 79. Se Bråket nr 19 sidan 9.

Filmvisning: Se sidan 7.

Seminarier (fortsättning)

Ti 05–22 kl. 15.15–16.15. Extra analysseminarium. Elena Prestini, Rom: *Singular integrals on product spaces related to the Carleson operator.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 4.

On 05–23 kl. 13.00. Seminarium i statistik. Professor David Krackhardt, Carnegie Mellon University, Pittsburgh, USA: *Network predictions in organizations.* Rum B705, Statistiska institutionen, SU, Universitetsvägen 10B, plan 7, Frescati. Se Bråket nr 19 sidan 10.

On 05–23 kl. 13.00–15.00. Licentiatseminarium i mekanik. Torbjörn Nielsen: *Electric Arc-Contact Interaction in High Current Gas-blast Circuit Breakers.* Granskare: **Docent Ingvar Axnäs,** Alfvénlaboratoriet, KTH. Seminarierummet, Institutionen för mekanik, KTH, Teknikringen 8.

On 05–23 kl. 13.15–14.15. Seminarium i analys och dynamiska system. Valeri Marenitch, Kalmar: *Manifolds with radial curvature bounded from below.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 3.

On 05–23 kl. 13.30. Seminar in Theoretical Physics. *(Observera dagen och tiden!)* **Professor Francis Farley:** *The 44 years of muon g-2.* Rum 4809, Fysikum, SU, Vanadisvägen 9. Se sidan 6.

On 05–23 kl. 14.00–15.00. Mittag-Leffler Seminar. Grigori Mints, Stanford: *Epsilon substitution: past and future.* Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 4.

On 05–23 kl. 15.15. Doktorandseminarium. Torsten Ekedahl: *Artins approximationssats.* Rum 16, hus 5, Matematiska institutionen, SU, Kräftriket. Se sidan 7.

On 05–23 kl. 15.15–16.00. Seminarium i matematik och fysik vid Mälardalens högskola (Västerås). Arman Kurtagic: *Stock market prediction with error correction neural networks (Master's Thesis).* Lektionssal N24, Mälardalens högskola, Västerås. Se sidan 7. Internet-adressen till information om seminariet är http://www.ima.mdh.se/seminarier/index.e.shtml.

On 05–23 kl. 15.30–16.30. Mittag-Leffler Seminar. Maria Maietti, Padova: *Categorical arithmetic universes from a type theoretic perspective.* Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 4.

Ti 05–29 kl. 15.15–17.00. Seminarium om beslutsstöd och informationsfusion i ledningssystem. Egils Sviestins, SaabTech Systems AB: *Sensordatafusion för framtidens lägesbild.* Sal E32, KTH, Lindstedtsvägen 3, entréplanet. Se Bråket nr 14 sidan 6 och detta nr sidan 4.

On 05–30 kl. 13.00. Seminarium i statistik. *(Observera lokalen!)* **Professor Alexander Martikainen** och **professor Andrei Frolov,** S:t Petersburg: *Properties of the longest monotone block in a sample of large size.* Rum B315, Statistiska institutionen, SU. Se sidan 5.

To 05–31 kl. 15.15–16.00. Seminarium i matematik och fysik vid Mälardalens högskola (Eskilstuna). Elisabet Ramström, Mälardalens högskola och Studsviks laboratorium: *Acceleratordriven transmutationsteknik för kärnavfall samt dess behov av kärndata.* Lektionssal B315, Mälardalens högskola, Eskilstuna. Internet-adressen till information om seminariet är http://www.ima.mdh.se/seminarier/index.e.shtml.

Fortsättning på nästa sida.

Seminarier (fortsättning)

Fr 06–01 kl. 9.00 – 10.00. Kollokvium i fysik. Professor Anders Nilsson, Uppsala universitet och Stanford Synchrotron Radiation Lab: *Local probing of adsorbate and hydrogen bonding using X-ray spectroscopy.* Sal F01, Fysiska institutionen, KTH, Lindstedtsvägen 24, b.v.

Fr 06–01 kl. 11.00 – 12.00. Optimization and Systems Theory Seminar. Anders Dahlén, Optimeringslära och systemteori, KTH: *Title to be announced.* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

In the seminar Anders Dahlén will give a summary of his doctoral thesis, which he will defend on Wednesday, June 6. *See page 6.*

ALGEBRASEMINARIUM

Michiel A. Hazewinkel: Witt vectors, symmetric functions, noncommutative symmetric functions and quasi-symmetric functions. Their interrelations and similarities.

Abstract: In this survey, I will discuss the incredibly rich structure of the Hopf ring of symmetric functions, or, what is the same thing, up to duality, the representative ring of the functor of the big Witt vectors. This structure is a Hopf ring, i.e., a ring object in the category of coalgebras; it is also a coHopf coring, i.e., a coring object in the category of algebras, and these structures are compatible and the whole thing is autodual. Even all that does not nearly exhaust the incredibly rich structure of the ring of symmetric functions.

More or less recently, in a variety of settings two generalizations of the symmetric functions have repeatedly appeared: noncommutative symmetric functions and quasi-symmetric functions (which are dual to each other). The question arises, also in view of several applications: How much of the structure of the ring of symmetric functions can be extended, respectively lifted, to these rings?

Tid och plats: Måndagen den 21 maj kl. 13.15 i rum 306, hus 6, Matematiska institutionen, SU, Kräftriket.

SEMINARIUM I ANALYS OCH DYNAMISKA SYSTEM

Valeri Marenitch: Manifolds with radial curvature bounded from below

Abstract: Global Riemannian Geometry describes relations between

1) local geometry of Riemannian manifolds (curvature tensor, sectional curvature, Ricci curvature, scalar curvature, etc.),
2) global geometric characteristics (diameter, volume, radius of injectivity, etc.), and
3) their topology.

We describe the most natural approach: the Morse theory of critical points of distance functions on a Riemannian manifold. We prove a parametric version of the global comparison theorem and apply it to obtain new proofs of some classical results and also some new results in a particular case of so-called manifolds with radial curvature bounded from below.

Tid och plats: Onsdagen den 23 maj kl. 13.15 – 14.15 i seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

EXTRA ANALYSSEMINARIUM

Elena Prestini: Singular integrals on product spaces related to the Carleson operator

Abstract: Open problems of convergence almost everywhere of Fourier series in several dimensions are presented. Singular integrals that appear related are considered and their L^p boundedness proven.

Tid och plats: Tisdagen den 22 maj kl. 15.15 – 16.15 i seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

MITTAG-LEFFLER SEMINAR

Grigori Mints: Epsilon substitution: past and future

Abstract: The epsilon substitution method introduced by Hilbert provides numerical realizations of existential sentences. We describe recent progress in its extension to impredicative systems and obstacles to further extension.

Tid och plats: Onsdagen den 23 maj kl. 14.00 – 15.00 i Institut Mittag-Leffler, Auravägen 17, Djursholm.

MITTAG-LEFFLER SEMINAR

Maria Maietti: Categorical arithmetic universes from a type theoretic perspective

Abstract: Categorical universes as pretoposes and elementary toposes can be shown to enjoy an internal language in the style of Martin-Löf's type theory. Among them there are arithmetic universes built by A. Joyal in order to give a categorical proof of Gödel's incompleteness theorems. We introduce the internal type theory of arithmetic universes viewed as pretoposes with parameterized lists. This type theory turns out to be useful to prove the conjectured existence of some free algebraic structures.

Tid och plats: Onsdagen den 23 maj kl. 15.30 – 16.30 i Institut Mittag-Leffler, Auravägen 17, Djursholm.

SEMINARIUM OM BESLUTSSTÖD OCH INFORMATIONSFUSION I LEDNINGSSYSTEM

Egils Sviestins: Sensordatafusion för framtidens lägesbild

Sammanfattning: Egils Sviestins' föredrag kommer att handla om sensordatafusion för mållägesbeskrivning. Han kommer att behandla grundläggande principer som till exempel skillnaden mellan centraliserad och decentraliserad datafusion. Vi kommer att få en överblick av trenderna beträffande olika metoder för associering, filtrering, hantering av systematiska fel, utnyttjande av passiva sensorer samt automatisk typestimering.

Tid och plats: Tisdagen den 29 maj kl. 15.15 – 17.00 i sal E32, KTH, Lindstedtsvägen 3, entréplanet.

KOLLOKVIUM I FYSIK — DOCENTFÖRELÄSNING

Jan Wallenius: Transmutation of nuclear waste — from basic physics to commercial application

Abstract: Transmutation of long lived radiotoxic nuclear waste in sub-critical reactors was proposed over 25 years ago. In this seminar, the basic physics motivating the introduction of such novel and expensive reactor types for this purpose will be reviewed.

Recently experimental activities on material development for accelerator driven systems (ADS) have started in Europe, Japan, and USA. An overview of these efforts will be given with emphasis on the difficulties required to be overcome when designing ADS that are not present in conventional reactors.

Construction of ADS prototypes is proposed to start by the end of this decade. The final step towards a commercial application is, however, a very complicated issue, considering economical and political constraints. A simple economic model of a nuclear reactor park including waste management by transmutation will be presented to highlight the potential costs of introducing accelerator driven systems.

Tid och plats: Fredagen den 18 maj kl. 9.00 – 10.00 i sal F 01, Fysiska institutionen, KTH, Lindstedtsvägen 24, b.v.

SEMINAR IN MATHEMATICAL PHYSICS

Edwin Langmann: Noncommutative gauge theory models, dimensional reduction and gravity

Abstract: I present recent work in collaboration with Richard Szabo, in which we demonstrate that a particular dimensional reduction of noncommutative electrodynamics induces a realization of a gauge theory of gravity.

Plan of talk: Introduction to noncommutative gauge theories; gravity as gauge theories; how to get diffeomorphism invariant models from dimensional reduced noncommutative electrodynamics.

Reference: http://xxx.sissa.it/abs/hep-th/0105094

Tid och plats: Fredagen den 18 maj kl. 16.15 i seminarierummet, Teoretisk fysik, KTH, Osquldas väg 6, plan 4.

SEMINARIUM I STATISTIK

Alexander Martikainen, Andrei Frolov: Properties of the longest monotone block in a sample of large size

Abstract: Given a sample of large size, let us find the longest nondecreasing sequence of consequent observations. We study first the almost sure asymptotics of the length of this sequence. Assume further that any observation is accompanied by a random "gain". We investigate then the asymptotics of the "total gain" over the longest monotone block. We also show that some well-known problems in probability appear as partial cases of this setting.

Tid och plats: Onsdagen den 30 maj kl. 13.00 i rum B315, Statistiska institutionen, SU.

SEMINAR IN THEORETICAL PHYSICS

Francis Farley: The 44 years of muon g-2

Abstract: The g-2 precession of the muon was commented in 1957 by Garwin Lederman and Weinrich in a footnote to their well-known paper. We follow the subsequent evolution, the three CERN experiments, various injection methods, discovery of the magic energy, improvements introduced at BNL. In the quantum soup around the muon the plot thickens . . . .

Tid och plats: Onsdagen den 23 maj kl. 13.30 i rum 4809, Fysikum, SU, Vanadisvägen 9.

DISPUTATION I OPTIMERINGSLÄRA OCH SYSTEMTEORI

Anders Dahlén

disputerar på avhandlingen

Identification of stochastic systems:
Subspace methods and covariance extension

onsdagen den 6 juni 2001 kl. 10.00 i Kollegiesalen, Administrationsbyggnaden, KTH, Valhallavägen 79. Till fakultetsopponent har utsetts *professor Giorgio Picci,* Università di Padova.

Abstract of the thesis

This thesis consists of four papers in identification of linear stochastic systems.

In the first paper it is briefly explained why certain subspace methods for identification of time-series may fail for theoretical reasons. Reproducible experiments are described that make it possible to test algorithms for failures. Massive failures of some popular subspace methods are verified through simulations.

In the second paper an alternative identification procedure which overcomes these difficulties is presented for scalar time-series. It is based on identification of a high-order maximum entropy model (AR model), followed by stochastically balanced truncation. The procedure is described using just linear algebraic operations, and therefore it inherits the nice properties of subspace methods. A complete analysis of the statistical convergence properties of the method is presented. In particular, it is shown that the transfer function of the estimated system tends in a "worst case" measure to the true transfer function. Simulations show convergence to the Cramér-Rao bounds of the obtained variances, as the data length increases.

In the third paper the identification procedure of the second paper is generalized to multivariate time-series. As in the scalar case, the procedure is described using just linear algebraic operations. The essential differences between the CCA subspace method and the proposed method are described. CCA estimates all covariances in a block Hankel matrix directly from data, whereas the proposed procedure uses covariance extension when constructing the Hankel matrix. A consistency and asymptotic normality proof for the identification procedure is given.

The fourth paper studies the relation between CCA and the proposed method (MEST) in more detail. For the sake of comparison, the two identification procedures are formulated in a uniform framework using the same truncation scheme, and from these expressions the essential difference becomes apparent. It is shown that MEST and CCA are asymptotically equivalent, which implies that they have the same asymptotic normal distribution. However, simulations indicate that AR-modelling and stochastically balanced truncation has a better performance than CCA in practice.

Filmvisning

Videofilmen *N is a Number: A Portrait of Paul Erdös* visas tisdagen den 22 maj kl. 15.30 i pausrummet, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 4. Filmen är cirka 60 minuter lång och visas på duk. Mat och dryck finns!

Paul Erdös avled 1996. Han var en av 1900-talets mest kända matematiker. Möt en annorlunda människa med ett extremt liv. Han var ständigt på resande fot utan anställning eller bostad, alltid funderande och samarbetande med ett stort antal andra matematiker.

Alla är välkomna!
Andreas Wannebo

DOKTORANDSEMINARIUM

Torsten Ekedahl: Artins approximationssats

Sammanfattning: Föredraget kommer att handla om Artins approximationssats och dess tillämpningar.

Tid och plats: Onsdagen den 23 maj kl. 15.15 i rum 16, hus 5, Matematiska institutionen, SU, Kräftriket.

SEMINARIUM I MATEMATIK OCH FYSIK VID MÄLARDALENS HÖGSKOLA (VÄSTERÅS)

Arman Kurtagic: Stock market prediction with error correction neural networks (Master's Thesis)

Abstract: The paper deals with the problem of stock market prediction with a neural network approach. The problem is solved with use of an Error Correction Neural Network (ECNN) with variance – invariance, which is a dynamical recursive system. Stock data are transformed to a log return, and with use of neural networks future data are predicted. The modelling is performed with sliding-window technique, which generates different parameters for the optimized trading rules in each time window. The main purpose of this thesis is to see if it is possible to forecast future behaviour of the stock market or any other time series with the recurrent dynamical system of the Error Correction Neural Network. The discussion is confined to technical analysis, i.e. predictions are based on past price data only. Computational results for this method are presented at the end of the paper.

Tid och plats: Onsdagen den 23 maj kl. 15.15 – 16.00 i lektionssal N24, Mälardalens högskola, Västerås.
