BRÅKET

Information om seminarier och högre undervisning i matematiska ämnen i Stockholmsområdet

NR 18 **FREDAGEN DEN 7 MAJ 2004**

BRÅKET

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

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Sista manustid för nästa nummer: Torsdagen den 13 maj kl. 13.00.

Kurs

Hisaya Fujioka: Sampled Data Control Theory. Se sidan 8.

Disputation i statistik

Johan Koskinen disputerar vid SU på avhandlingen *Essays on Bayesian Inference for Social Networks* den 21 maj kl. 10.00. Se sidan 9.

Money, jobs: Se sidorna 10 – 11.

SEMINARIER

Fr 05–07 kl. 11.00 – 12.00. Optimization and Systems Theory Seminar. Dr Fabio Celani, Centre for Ships and Ocean Structures, Norwegian University of Science and Technology, Trondheim: *A high-gain observer for Euler-Lagrange systems with position measurements.* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se Bråket nr 17 sidan 5.

Fr 05–07 kl. 14.15. Mathematical Physics Seminar. *(Observera tiden!)* **Dr Øystein Elgarøy,** Oslo: *Upper limits on neutrino masses from cosmology.* Seminarierummet i hus 11 (rum 112:028), Roslagstullsbacken 11, Stockholms centrum för fysik, astronomi, bioteknik (SCFAB, AlbaNova).

Fr 05–07 kl. 14.15. Seminarium i teoretisk datalogi. Ronald Cramer, BRICS: *Primitive sets in number fields for absolutely optimal black box secret sharing.* Rum 1537, Nada, KTH, Lindstedtsvägen 3, plan 5. Se sidan 8.

Må 05–10 kl. 14.15 – 15.00. Seminarium i numerisk analys. Jonas Englund, Lund: *Stable algorithm for the stress field around a branched crack.* Rum 4523, Nada, KTH, Lindstedtsvägen 5, plan 5. Se Bråket nr 17 sidan 6.

Må 05–10 kl. 15.15 – 17.00. Seminarium i matematisk statistik. Professor Kurt Johansson, Matematik, KTH: *Universality of distributions from random matrix theory.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se Bråket nr 17 sidan 3.

Ti 05–11 kl. 10.15. Plurikomplexa seminariet. Ragnar Sigurdsson, Reykjavik: *Green functions with singularities along complex spaces.* Rum 306, hus 6, Matematiska institutionen, SU, Kräftriket. Se sidan 4.

Fortsättning på nästa sida.

Seminarier (fortsättning)

Ti 05–11 kl. 13.15. Plurikomplexa seminariet. Jan Wiegerinck, Amsterdam: *The pluripolar hull of a graph.* Rum 306, hus 6, Matematiska institutionen, SU, Kräftriket. Se sidan 4.

Ti 05–11 kl. 14.00–15.00. Mittag-Leffler Seminar. Geir Ellingsrud, Oslo: *Title to be announced.* Institut Mittag-Leffler, Auravägen 17, Djursholm.

On 05–12 kl. 13.00. Seminarium i statistik. Fridtjof Thomas, Väg- och transportforskningsinstitutet, Borlänge: *Fitting mixed effects models to rut degradation in heavy vehicle simulator testing of three different asphalt overlays.* Sal B705, Statistiska institutionen, SU, Universitetsvägen 10B, plan 7, Frescati. Se Bråket nr 17 sidan 6.

On 05–12 kl. 13.15. Logikseminariet Stockholm-Uppsala. Olov Wilander: *A short introduction to Joyal's combinatorial species.* Sal 3513, Matematiska institutionen, Polacksbacken, Uppsala universitet. Se sidan 4.

On 05–12 kl. 13.15–14.15. Seminarium i analys och dynamiska system. T. Hoffermann-Ostenhof, Wien: *Nodal domain theorems.* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 7.

On 05–12 kl. 13.15–15.00. Algebra and Geometry Seminar. David Rydh: *Families of cycles and the Hilbert-Chow morphism.* Rum 306, hus 6, Matematiska institutionen, SU, Kräftriket. Se sidan 5.

On 05–12 kl. 15.15. Seminarium i matematisk statistik. Hermann Thorisson, University of Iceland: *Poisson tree.* Rum 306 (Cramérrummet), hus 6, Matematiska institutionen, SU, Kräftriket. Se sidan 6.

To 05–13 kl. 14.00–15.00. Mittag-Leffler Seminar. Arne Sletsjøe, Oslo: *Indecomposable representations of non-commutative plane curves.* Institut Mittag-Leffler, Auravägen 17, Djursholm.

To 05–13 kl. 14.00–15.00. Presentation av examensarbete i matematik. Michael Paulsen: *Methods of solving the Dirichlet problem.* Sal 16, hus 5, Matematiska institutionen, SU, Kräftriket. Se sidan 10.

To 05–13 kl. 14.00–16.00. Kollokvium i filosofi. Susan Hurley, University of Warwick: *Rational agency, cooperation, and mind-reading.* Rum D255, Filosofiska institutionen, SU.

To 05–13 kl. 15.15–17.00. Seminarium. Markus Rosellen: *Non-commutative rings and deformation quantization.* Rum 306, hus 6, Matematiska institutionen, SU, Kräftriket. Se sidan 6.

Fr 05–14 kl. 11.00–12.00. Optimization and Systems Theory Seminar. Professor Daizan Cheng, Institute of Systems Sciences, Chinese Academy of Sciences, Beijing: *Control of switched systems.* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se Bråket nr 17 sidan 5.

Må 05–17 kl. 10.30–11.30. Seminarium i analys och dynamiska system. *(Extra seminarium. Observera dagen och tiden!)* **Peter Jones,** Yale University: *Title to be announced.* Seminariet skall äga rum på KTH. Lokal meddelas senare.

Må 05–17 kl. 13.15–14.15. DNA-seminariet Uppsala-KTH (dynamiska system, talteori, analys). Marco Martens, University of Groningen: *Title to be announced.* Seminariet skall äga rum på KTH. Lokal meddelas senare.

Fortsättning på nästa sida.

Seminarier (fortsättning)

Må 05–17 kl. 14.00 – 15.00. Kombinatorikseminarium. *(Observera dagen och tiden!)* **Ömer Egecioglu,** Department of Computer Science, University of California at Santa Barbara: *From a polynomial Riemann hypothesis to alternating sign matrices.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 7.

Må 05–17 kl. 14.15 – 15.00. Seminarium i numerisk analys. Yueqiang Liu, Electric Field Theory, Chalmers tekniska högskola, Göteborg: *Eddy current computations using edge elements and adaptive grids.* Rum 4523, Nada, KTH, Lindstedtsvägen 5, plan 5. Se nedan.

Ti 05–18 kl. 14.00 – 16.00. Kollokvium i filosofi. Paisley Livingstone, Lignan University, Hong Kong: *What is a text?* Rum D255, Filosofiska institutionen, SU.

On 05–19 kl. 13.15 – 14.15. Seminarium i analys och dynamiska system. M. Solomyak, Rehovot, Israel: *On the spectrum of a family of differential operators appearing in the theory of irreversible quantum graphs. General theory.* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 5.

SEMINARIUM I NUMERISK ANALYS

Yueqiang Liu:
Eddy current computations using edge elements and adaptive grids

Abstract: Since a few years, curl-conforming edge (Nedelec) elements are commonly used for solving Maxwell's curl-curl equations. We have investigated the properties of edge elements for low-frequency, eddy current calculations in three-dimensional geometry with a number of complications occurring in practical applications such as: sharp corners, large jumps in material properties (permeability, permittivity, conductivity) and laminated materials (anisotropy). The main results are:

1. We introduced a new procedure to satisfy the solvability condition for the curl-curl equation, where the source was specified as a current density.
2. We found that the so-called "ungauged" formulation with vector and scalar potentials significantly improves the convergence of iterative solvers. Moreover, special care must be paid to the null space of the curl-curl operator when choosing a preconditioner.
3. Using adaptive mesh refinement techniques based on a recent a posteriori error estimate, we were able to restore the quadratic convergence with respect to the grid size for the magnetic energy, despite singularities occurring at corners.
4. We found that the lowest (mixed) order tetrahedral elements with incomplete basis functions produce inaccurate results for eddy currents in laminated conductors (e.g., the power dissipation cannot be even crudely estimated with a moderate number of elements). Much more accurate results are obtained by using mixed order hexahedral elements, aligned with the laminations, or by introducing the complete first order basis for tetrahedral elements.

As an example, we show computations for a hydrogenerator model.

Tid och plats: Måndagen den 17 maj kl. 14.15 – 15.00 i rum 4523, Nada, KTH, Lindstedtsvägen 5, plan 5.

PLURIKOMPLEXA SEMINARIET

Ragnar Sigurdsson:
Green functions with singularities along complex spaces

Abstract: The talk is report on a joint work with Alexander Rashkovskii, Stavanger. We study the properties of a Green function G_A with logarithmic singularities along a complex subspace A of a complex manifold X. It is defined as the largest negative plurisubharmonic function u satisfying locally $u \leq \log|\psi| + C$, where $\psi = (\psi_1, \dots, \psi_m)$, $\psi_1, \dots, \psi_m$ are local generators for the ideal sheaf I_A of A, and C is a constant depending on the function u and the generators. The main motivation for this study is to estimate bounded holomorphic functions with zeros of given multiplicities in a prescribed set.

Tid och plats: Tisdagen den 11 maj kl. 10.15 i rum 306, hus 6, Matematiska institutionen, SU, Kräftriket.

PLURIKOMPLEXA SEMINARIET

Jan Wiegerinck:
The pluripolar hull of a graph

Abstract: A set $E \subset \mathbb{C}^n$ is called pluripolar if it is contained in the $-\infty$ set of a plurisubharmonic function defined on a neighbourhood of E. One may wonder when such an E is complete, i.e., *equal* to the $-\infty$ set of a PSH-function. The graph Γ_f of a holomorphic function f on a domain in $\mathbb{C}$ is a typical example of a pluripolar subset of $\mathbb{C}^2$. This graph is complete in a domain $\Omega \subset \mathbb{C}^2$ if it is equal to its pluripolar hull in Ω:

$$E^*_\Omega = \{z \in \Omega : h|_E = -\infty \text{ implies } h(z) = -\infty,\ h \in \mathrm{psh}(\Omega)\}.$$

In this talk I will report on joint work with Armen Edigarian dealing with the following results. Even if f cannot be extended over the boundary of D, the graph Γ_f of f may have a non-trivial pluripolar hull (and then it is not complete). When the domain D of f is the complement of a polar subset of a larger domain $\tilde{D}$, we can give a precise description of $E^*_{\tilde{D}}$. It will be the graph of an extension of f to a set X, $D \subset X \subset \tilde{D}$. A condition in terms of classical potential theoretic properties of f determines which points belong to $X \setminus D$.

Tid och plats: Tisdagen den 11 maj kl. 13.15 i rum 306, hus 6, Matematiska institutionen, SU, Kräftriket.

LOGIKSEMINARIET STOCKHOLM-UPPSALA

Olov Wilander:
A short introduction to Joyal's combinatorial species

Abstract: Joyal's species offers a "categorified" view of some combinatorial constructions, where we see a combinatorial structure as a functor on the category of finite sets. It gives a structured approach to some of the combinatorial information about these structures, by ways of generating series.

Tid och plats: Onsdagen den 12 maj kl. 13.15 i sal 3513, Matematiska institutionen, Polacksbacken, Uppsala universitet.

ALGEBRA AND GEOMETRY SEMINAR

David Rydh:
Families of cycles and the Hilbert-Chow morphism

Abstract: Let X be a projective variety. A classical result in algebraic geometry is the existence of the Chow variety $\mathrm{Chow}_{r,d}(X)$. It parameterizes cycles on X of dimension r and degree d, i.e. the geometrical points of the Chow variety corresponds to the cycles on X. On the other hand, it is not obvious what a family of cycles is. In particular, flatness is not the correct notion. Also, several problems appear in positive characteristic and almost nothing is known about infinitesimal families.

There is a canonical morphism from the Hilbert scheme to the "Chow scheme", which on points takes a scheme to its fundamental cycle. Using the Hilbert-Chow morphism, some information about both the Hilbert and Chow schemes can be obtained. For example, the Hilbert-Chow morphism is an isomorphism over the open subset of $\mathrm{Hilb}(X)$ parameterizing normal schemes.

I will define the correct notion of a family of cycles parameterized by a *seminormal* scheme. Also, I will define what I think should be called the "Chow scheme".

Tid och plats: Onsdagen den 12 maj kl. 13.15 – 15.00 i rum 306, hus 6, Matematiska institutionen, SU, Kräftriket.

SEMINARIUM I ANALYS OCH DYNAMISKA SYSTEM

M. Solomyak:
On the spectrum of a family of differential operators appearing in the theory of irreversible quantum graphs. General theory

Abstract: We study the spectrum of a family A_α of partial differential operators, depending on a real parameter α. The differential expression, which defines the action of the operator, does not involve α, it appears only in the boundary condition. From the point of view of the Perturbation Theory, we are dealing with the operators, defined via their quadratic forms, and the perturbation is only form-bounded, but not form-compact with respect to the unperturbed operator. This situation is rather unusual for this class of problems, which is reflected in the character of the results. In particular, there exists the "borderline" value $\alpha_0 = \sqrt{2}$, such that the spectral properties of A_α for $\alpha < \sqrt{2}$ and for $\alpha > \sqrt{2}$ are quite different ("phase transition"). The quadratic form approach works only for $\alpha < \sqrt{2}$, for the large α a different technique is necessary.

The results for large α are obtained in cooperation with S. Naboko.

Tid och plats: Onsdagen den 19 maj kl. 13.15 – 14.15 i seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

SEMINARIUM I MATEMATISK STATISTIK

Hermann Thorisson: Poisson tree

Abstract: Imagine we are standing at a red point on a white line that stretches endlessly in both directions. Now infinitely many red points are scattered over the line completely at random with finitely many points in each bounded interval (one-dimensional Poisson process). If we move to the n-th red point on the right (or the left), then the point pattern will not be biased, in the sense that seen from that point the other red points look just like they were scattered completely at random. That is, the point pattern looks the same from all its points (point-stationarity).

Then imagine we are standing at a red point on a white plane that stretches endlessly in all directions. Infinitely many red points are scattered over the plane completely at random with finitely many points in each bounded region (two-dimensional Poisson process). This point pattern should also look the same from all its points, or what?

But now things get complicated: how are we to move between the points without biasing the point pattern? If we move, for instance, along a straight line to the right, then the probability is zero that we ever hit a red point, and the same applies to all the other directions. Of course there are many ways to move to another red point. For instance, we could move to the red point that is nearest to the one we are standing at. But it is easy to show that seen from that point the other points do *not* look like they were scattered completely at random.

In the plane (and in higher dimensions) the question thus is whether there is a way to move between the red points without biasing the point pattern. Recently many positive answers to this question have been found. They are all based on connecting the red points into a tree (in a certain way) and then walking between them along the branches of the tree (in a certain way). In this talk we will construct such a "Poisson tree" and explain the reason why walking around in it does not bias the point pattern.

A related problem is the following: if there is no red point where we are standing, can we move to one of the red points in such a way that seen from that point the other points look just like they were scattered completely at random? The answer is also yes in this case. These two problems are part of a more general research project for general point patterns (Palm theory). They were solved in [1] provided external randomization is allowed, but here we are looking for non-randomized ways to choose a point.

Reference:

[1] Thorisson, H.: *Coupling, Stationarity, and Regeneration.* Springer-Verlag, 2000.

Tid och plats: Onsdagen den 12 maj kl. 15.15 i rum 306 (Cramérrummet), hus 6, Matematiska institutionen, SU, Kräftriket.

SEMINARIUM

Markus Rosellen: Non-commutative rings and deformation quantization

Abstract: I will discuss the notion of deformation quantization of a Poisson algebra. I will explain in which sense deformation quantization is inverse to the passage to the associated graded ring of a filtered ring. As examples, I will consider the Weyl algebra and universal enveloping algebras.

Tid och plats: Torsdagen den 13 maj kl. 15.15 – 17.00 i rum 306, hus 6, Matematiska institutionen, SU, Kräftriket.

SEMINARIUM I ANALYS OCH DYNAMISKA SYSTEM

T. Hoffermann-Ostenhof: Nodal domain theorems

Abstract: We discuss generalizations of Courant's nodal theorem. In addition we report on some open questions concerning the relation between the spectrum and the nodal domains of eigenfunctions.

This is joint work with A. Ancona and B. Helffer.

Tid och plats: Onsdagen den 12 maj kl. 13.15 – 14.15 i seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

KOMBINATORIKSEMINARIUM

Ömer Egecioglu:
From a polynomial Riemann hypothesis to alternating sign matrices

Abstract: The consideration of a class of polynomial Riemann hypotheses leads to 3-term and higher order polynomial recursions, and the asymptotic versions of the recursions give rise to polynomial sequences where the zeros have the classical properties of the zeros of real orthogonal polynomials. Surprisingly, the associated linear functional is related to Alternating Sign Matrices (ASM's) with vertical symmetry. This talk will present the relationship between 4-term recursions, orthogonality, Hankel determinants, ASM's, classes of tableaux, and the world's longest certificate.

We begin with a brief discussion of a class of polynomial Riemann hypotheses, which leads to the consideration of sequences of orthogonal polynomials and 3-term recursions. The discussion further leads to higher order polynomial recursions, including 4-term recursions where orthogonality is lost. Nevertheless, we show that classical results on the nature of zeros of real orthogonal polynomials (i.e., that the zeros of p_n are real and those of p_{n+1} interleave those of p_n) may be extended to polynomial sequences satisfying certain 4-term recursions. As with the 3-term recursions, the 4-term recursions give rise naturally to a linear functional. In the case of 3-term recursions, the zeros fall nicely into place when it is known that the functional is positive, but in the case of our 4-term recursions, we show that the functional can be positive even when there are non-real zeros among some of the polynomials. It is interesting, however, that for our 4-term recursions positivity is guaranteed when a certain real parameter C satisfies $C \geq 3$, and this is exactly the condition of our result that guarantees that the zeros have the aforementioned interleaving property.

Next we use a classical determinant criterion to find exactly when the associated linear functional is positive. It turns out that the Hankel determinants Δ_n formed from the sequence of moments of the functional when $C = 3$ give rise to the initial values of the integer sequence 1, 3, 26, 646, 45885, ... of Alternating Sign Matrices (ASM's) with vertical symmetry. We give 9 diverse characterizations of this sequence of moments and specify these Hankel determinants as Macdonald-type integrals. We also provide an infinite class of integer sequences, each sequence of which gives the Hankel determinants Δ_n of the moments.

Finally, we show that certain n-tuples of non-intersecting lattice paths are evaluated by a related class of special Hankel determinants. This class includes the Δ_n. At the same time, ASM's with vertical symmetry can readily be identified with certain n-tuples of osculating paths. These two lattice path models appear as a natural bridge from the ASM's with vertical symmetry to Hankel determinants.

Tid och plats: Måndagen den 17 maj kl. 14.00 – 15.00 i seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

SEMINARIUM I TEORETISK DATALOGI

Ronald Cramer: Primitive sets in number fields for absolutely optimal black box secret sharing

Abstract: A black box secret sharing scheme (BBSSS) for a threshold access structure is a linear secret sharing scheme that works for any finite abelian group. Introduced by Desmedt and Frankel, the problem has been rigourously analysed by Cramer and Fehr.

BBSSS can be based on number fields with certain properties. The approach by Desmedt and Frankel relies on number fields with large Lenstra constant, i.e., number fields over which a "large" invertible Vandermonde matrix exists. The best known choices for these number fields lead to BBSSS with expansion factor $O(n)$, where n is the number if players. The expansion factor corresponds to the length of each share, i.e., the number of group elements received from the dealer by each player. The solution of Cramer and Fehr achieves expansion factor $O(\log n)$, which is asymptotically optimal. It relies on low-degree number fields over which a pair of "large" Vandermonde matrices exists whose determinants are co-prime.

We propose a new approach which aims at achieving an absolutely optimal solution. Our approach is based on low-degree number fields containing a "large primitive set". We give some experimental as well as some theoretical results.

This is joint work with H. W. Lenstra Jr. and M. Stam.

Tid och plats: Fredagen den 7 maj kl. 14.15 i rum 1537, Nada, KTH, Lindstedtsvägen 3, plan 5.

GRADUATE COURSE IN OPTIMIZATION AND SYSTEMS THEORY

Hisaya Fujioka: Sampled Data Control Theory

Hisaya Fujioka from Kyoto University will give a short course on Sampled Data Control Theory in the first week of June, 2004.

Course content: This is a mini-course on the modern sampled-data control theory. By sampled-data system we mean an interconnection of continuous-time and discrete-time systems through analogue-to-digital and digital-to-analogue converters. Our main target is digital control systems, however, a lot of engineering systems including digital communication systems are sampled-data systems. The signals of interest in sampled-data systems are usually continuous-time signals and hence we will evaluate the performance based on continuous-time signals. This is a main difference from the classical discrete-time control theory. We will cover analysis and synthesis methods for sampled-data systems. These are counterparts of $H2$ and H-infinity control theory for continuous-time systems.

More information about the course and a schedule can be found on the homepage http://www.math.kth.se/~uj/Fujioka/SDCT.html.

If you plan to take the course for credit, then inform me (e-mail ulfj@math.kth.se) as soon as possible. You are welcome to attend the seminars even if you do not intend to take the course for credit.

Ulf Jönsson

DISPUTATION I STATISTIK

Johan Koskinen

disputerar på avhandlingen

Essays on Bayesian Inference for Social Networks

fredagen den 21 maj kl. 10.00 i hörsal 3, hus B, södra huset, Frescati. Till fakultetsopponent har utsetts *professor Philippa Pattison,* Department of Psychology, University of Melbourne.

Abstract of the thesis

This thesis presents Bayesian solutions to inference problems for three types of social network data structures: a single observation of a social network, repeated observations on the same social network, and repeated observations on a social network developing through time.

A social network is conceived as being a structure consisting of actors and their social interaction with each other. A common conceptualization of social networks is to let the actors be represented by nodes in a graph with edges between pairs of nodes that are relationally tied to each other according to some definition. Statistical analysis of social networks is to a large extent concerned with modelling of these relational ties, which lends itself to empirical evaluation.

The first paper deals with a family of statistical models for social networks called exponential random graphs that takes various structural features of the network into account. In general, the likelihood functions of exponential random graphs are only known up to a constant of proportionality. A procedure for performing Bayesian inference using Markov chain Monte Carlo (MCMC) methods is presented. The algorithm consists of two basic steps, one in which an ordinary Metropolis-Hastings up-dating step is used, and another in which an importance sampling scheme is used to calculate the acceptance probability of the Metropolis-Hastings step.

In paper number two a method for modelling reports given by actors (or other informants) on their social interaction with others is investigated in a Bayesian framework. The model contains two basic ingredients: the unknown network structure and functions that link this unknown network structure to the reports given by the actors. These functions take the form of probit link functions. An intrinsic problem is that the model is not identified, meaning that there are combinations of values on the unknown structure and the parameters in the probit link functions that are observationally equivalent. Instead of using restrictions for achieving identification, it is proposed that the different observationally equivalent combinations of parameters and unknown structure be investigated a posteriori. Estimation of parameters is carried out using Gibbs sampling with a switching devise that enables transitions between posterior modal regions. The main goal of the procedures is to provide tools for comparisons of different model specifications.

Papers 3 and 4 propose Bayesian methods for longitudinal social networks. The premise of the models investigated is that overall change in social networks occurs as a consequence of sequences of incremental changes. Models for the evolution of social networks using continuous-time Markov chains are meant to capture these dynamics. Paper 3 presents an MCMC algorithm for exploring the posteriors of parameters for such Markov chains. More specifically, the unobserved evolution of the network in-between observations is explicitly modelled, thereby avoiding the need to deal with explicit formulas for the transition probabilities. This enables likelihood based parameter inference in a wider class of network evolution models than has been available before. Paper 4 builds on the proposed inference procedure of Paper 3 and demonstrates how to perform model selection for a class of network evolution models.

PRESENTATION AV EXAMENSARBETE I MATEMATIK

Michael Paulsen:
Methods of solving the Dirichlet problem

Sammanfattning: Det klassiska Dirichletproblemet är följande. Låt D vara ett öppet sammanhängande område och hitta en funktion u, sådan att u är harmonisk i D och lika med en given kontinuerlig funktion g på randen av D.

Vi visar att om D är begränsat så kommer problemet att ha högst en lösning. Huvuddelen av arbetet ägnas åt tre olika metoder att hitta lösningar. Den första går ut på att konstruera Green's funktion, och om det lyckas så reduceras problemet till en integralekvation över randen av D. Perron's metod fungerar på alla områden vars rand är reguljär, och ett tredje sätt att lösa problemet är att minimera den s.k. Dirichletintegralen, eftersom en lösning u kommer att minimera en sådan integral. Vi visar även att om Dirichletproblemet har en lösning, så kommer denna att svara mot väntevärdet för g som funktion av en Brownsk rörelse vid utgångstiden från D, så länge g och D är begränsade.

Tid och plats: Torsdagen den 13 maj kl. 14.00 – 15.00 i sal 16, hus 5, Matematiska institutionen, SU, Kräftriket.

MONEY, JOBS

Columnist: Hans Rullgård, Department of Mathematics, SU. E-mail: hansr@math.su.se.

Info = information. This will be given and repeated until obsolete. Rely on other sources as well.
BBKTH = Bulletin Board at the Department of Mathematics, KTH.
BBSU = Bulletin Board at the Department of Mathematics, SU.
The following information, with links, is also available at http://www.math.su.se/~hansr/mj.html.
Unless stated otherwise, a given date is the last date (e.g. for applications), and the year is 2004. A number without an explanation is a telephone number.

Standard information channels

1. A channel to information from Vetenskapsrådet: http://www.vr.se/naturteknik/index.asp.
2. A channel to information from the European Mathematical Society: http://www.emis.de.
3. A channel to information from the American Mathematical Society: http://www.ams.org.
4. KTH site for information on funds: http://www.kth.se/aktuellt/stipendier.
5. Stockholm University site for information on funds: http://www.su.se/forskning/stipendier/databas.php3.
6. Umeå site for information on funds: http://www.umu.se/umu/aktuellt/stipendier_fond_anslag.html.
7. Job announcement site: http://www.maths.lth.se/nordic/Euro-Math-Job.html. This is run by the European Mathematical Society.
8. Stiftelsen för internationalisering av högre utbildning och forskning (STINT) site for information on funds: http://www.stint.se.
9. Nordisk Forskerutdanningsakademi (NorFA) site for information on funds: http://www.norfa.no.
10. Svenska institutet (SI) site for information on funds: http://www.si.se.

New information

Jobs, to apply for

11. Institutionen för matematisk statistik vid Umeå universitet söker en forskarassistent i matematisk statistik med inriktning mot bioinformatik, 27 maj. Info: Lennart Nilsson, 090-786 60 77, e-post ln@matstat.umu.se, Lennart Bondesson, 090-786 65 29, e-post lennart.bondesson@matstat.umu.se. Web-info: http://www.umu.se/umu/aktuellt/arkiv/lediga_tjanster/312-1130-04.html.

(Continued on the next page.)

12. Institutionen för teknik, fysik och matematik, Campus Sundsvall, eller Institutionen för utbildningsvetenskap, Campus Härnösand, vid Mitthögskolan söker en universitetslektor i matematikdidaktik, 9 juni. Info: Olof Björkqvist eller Anders Olofsson, 0611-86 000. Web-info: http://www.mh.se/MHTemplates/MHPage____11639.aspx.

13. Matematiska vetenskaper vid Göteborgs universitet söker en forskarassistent i tillämpad matematik med inriktning mot biomatematik, 17 maj. Info: Bernt Wennberg, 031-772 53 26, e-post wennberg@math.chalmers.se. Web-info: http://ledig-anstallning.adm.gu.se.

Old information

Money, to apply for

14. Från Vetenskapsrådet kan medel sökas för 2005 och följande år för forskning inom alla ämnesområden. Sista ansökningsdag är 20 april för ansökningar om bidrag för forskning och 17 maj för ansökningar om bidrag till starka forskningsmiljöer. Web-info: http://www.vr.se/sokbidrag/index.asp?id=190&dok_id=6152.

15. Letterstedtska föreningen utlyser anslag till bland annat anordnande av nordiska konferenser och seminarier och gästbesök av nordiska forskare. Anslag utdelas vid två tillfällen under 2004; ansökningar skall vara inkomna senast 15 februari respektive 15 september till Letterstedtska föreningens huvudstyrelse, Box 22333, 104 22 Stockholm. Web-info: se punkt 6 ovan.

16. Sweden-Japan Foundation (SJF) utlyser stipendier för studier, forskning samt examensarbete och praktik på högskolenivå i Japan. Stipendierna är främst avsedda för studier inom teknik, naturvetenskap, ekonomi, juridik, medicin och handel. Beslut fattas vid två tillfällen per år. Sista ansökningsdagar är den 1 mars och den 1 oktober. Info: SJF, 08-611 68 73. Web-info: http://www.swejap.a.se.

17. Från Knut och Alice Wallenbergs Stiftelse ställs anslag till rektors för KTH förfogande för att "i första hand användas till bidrag för sådana resor, som bäst befordrar ett personligt vetenskapligt utbyte till gagn för svensk forskning. Bidrag skall främst beviljas till yngre forskare. Medel kan även — efter rektors bedömning — undantagsvis disponeras för utländska gästforskare." Bidrag kan sökas under hela året. Info: Anette Nyström, 08-790 70 59. Web-info: se punkt 4 ovan.

Jobs, to apply for

18. Området Lärarutbildningen vid Malmö högskola söker minst en universitetsadjunkt i matematik med inriktning mot undervisning av yngre barn, 21 maj. Info: Harriet Axelsson, 040-665 80 21. Web-info: http://www.mah.se/platsann.asp?DNR=705.

19. Matematiska och systemtekniska institutionen vid Växjö universitet söker en doktorand i tillämpad matematik (speciellt inriktad mot matematiska modeller inom simulering i kvantinformationsteori), 1 juni. Info: Andrei Khrennikov, 0470-70 87 90, e-post Andrei.Khrennikov@msi.vxu.se, Mathias Hedenborg, 0470-70 86 38, e-post mathias.hedenborg@msi.vxu.se. Web-info: http://www.vxu.se/jobb/040601_doktorand_matematik.html.