BRÅKET

Information om seminarier och högre undervisning i matematiska ämnen i Stockholmsområdet

NR 38 **FREDAGEN DEN 1 DECEMBER 2006**

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: gunnarkn@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

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Sista manustid för nästa nummer:
Torsdagen den 7 december kl. 13.00.

Disputation i datalogi

Robert Suzić disputerar vid KTH på avhandlingen *Stochastic Multi-Agent Plan Recognition, Knowledge Representation and Simulations for Efficient Decision Making* måndagen den 11 december kl. 14.00. Se sidan 10.

Money, jobs: Se sidorna 11 – 13.

SEMINARIER

Fr 12–01 kl. 13.15 – 14.15. Graduate Student Seminar. Jonas Kiessling, Matematik, KTH: *Elementary algebraic topology.* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se Bråket nr 37 sidan 8.

Må 12–04 kl. 13.15 – 14.15. Seminar in Analysis and its Applications. Tomas Sjödin, University College Dublin: *Quadrature domains for harmonic functions.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se Bråket nr 37 sidan 4.

Må 12–04 kl. 13.15 – 15.00 (cirka). Informellt doktorandseminarium i teoretisk datalogi. Johan Håstad, Teorigruppen, KTH CSC: *Verifying proofs by reading only 3 bits (part 1 of 2).* Rum 1537, KTH CSC, Lindstedtsvägen 3, plan 5. Se sidan 4.

Observera att dagarna för Johan Håstads seminarier har ändrats. I Bråket nr 37 anges fel dagar för hans seminarier.

Må 12–04 kl. 15.15 – 17.00. Seminarium i matematisk statistik. Professor Thomas Mikosch, Laboratory of Actuarial Mathematics, University of Copenhagen: *Scaling limits for workload processes.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se Bråket nr 37 sidan 8.

Ti 12–05 kl. 10.15. Plurikomplexa seminariet. Stefan Nemirovski, Moskva: *Lagrangian embeddings of the Klein bottle.* Sal 64119, Ångströmlaboratoriet, Uppsala universitet. Se sidan 5.

Ti 12–05 kl. 13.15. Plurikomplexa seminariet. Oleg Viro, Uppsala: *Traces of complex on real.* Sal 64119, Ångströmlaboratoriet, Uppsala universitet. Se sidan 6.

Fortsättning på nästa sida.

Seminarier (fortsättning)

Ti 12–05 kl. 14.00–15.00. Mittag-Leffler Seminar. Andrew Kresch, University of Zürich: *Intersection theory on stacks, I.* Institut Mittag-Leffler, Auravägen 17, Djursholm.

Ti 12–05 kl. 15.30–16.30. Mittag-Leffler Seminar. Timothy Logvinenko, Institut Mittag-Leffler och KTH: *Construction of crepant resolutions as GIT moduli spaces.* Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 7.

On 12–06 kl. 10.15–11.15. Kombinatorikseminarium. Anders Claesson, Reykjavik University: *Conway's napkin problem.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 8.

On 12–06 kl. 10.30. Logikseminariet Stockholm-Uppsala. Jouko Väänänen, Helsingfors: *Dependence logic.* Sal 64119, Ångströmlaboratoriet, Uppsala universitet. Se sidan 11.

On 12–06 kl. 11.00. Common SU KoF/KTH Theoretical Physics Seminar. Erik Lindahl, DBB, SU: *Thermodynamical properties of biological molecules through loosely coupled or distributed simulations: protein folding and insertion in biomembranes.* Sal FB51, Roslagstullsbacken 21, AlbaNova universitetscentrum. Se sidan 9.

On 12–06 kl. 13.15–14.15. Seminarium i analys och dynamiska system. Pär Kurlberg, KTH: *Lower bounds on the order of some pseudorandom number generators.* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 8.

On 12–06 kl. 15.00–15.45. Seminarium i matematisk statistik. Anders Björkström, SU: *Predictor construction in multivariate regression: A framework and some comparisons.* Rum 306 (Cramérrummet), hus 6, Matematiska institutionen, SU, Kräftriket. Se sidan 10.

On 12–06 kl. 16.00–17.00. KTH/SU Mathematics Colloquium. Nicolai Reshetikhin, University of California, Berkeley: *Mathematics of dimer models.* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Kaffe/te serveras kl. 15.30 i pausrummet, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 4. Se sidan 6.

On 12–06 kl. 17.15. Linnaeus Center ACCESS Distinguished Lecture Series. Professor Zhi-Quan Luo, University of Minnesota: *Optimal spectral management: Complexity, Lyapunov theorem and approximation.* Sal Q2, KTH, Osquldas väg 10, 1 tr. ned. Se Bråket nr 37 sidan 7.

To 12–07 kl. 13.15. Logikseminariet Stockholm-Uppsala. *(Observera dagen och tiden!)* **Dag Normann,** Oslo: *Domain theory based hierarchies of total functionals.* Sal 11167, Ångströmlaboratoriet, Uppsala universitet. Se sidan 5.

To 12–07 kl. 14.00–15.00. Mittag-Leffler Seminar. Andrew Kresch, University of Zürich: *Intersection theory on stacks, II.* Institut Mittag-Leffler, Auravägen 17, Djursholm.

To 12–07 kl. 14.00–16.00. Kollokvium i filosofi. Patrick Greenough, St. Andrews: *How to be a reliabilist.* Rum D255, Filosofiska institutionen, SU.

Fortsättning på nästa sida.

Seminarier (fortsättning)

To 12–07 kl. 15.30–16.30. Mittag-Leffler Seminar. Satoshi Minabe, Nagoya University: *Topological vertex and local Gromov-Witten invariants of del Pezzo surfaces.* Institut Mittag-Leffler, Auravägen 17, Djursholm. Se sidan 5.

Fr 12–08 kl. 9.00–9.50. Nobelföreläsning i fysik. John C. Mather, NASA Goddard Space Flight Center, USA: *From the Big Bang to the Nobel Prize: the story of COBE.* Aula Magna, SU.

Fr 12–08 kl. 9.50–10.40. Nobelföreläsning i fysik. George F. Smoot, University of California, Berkeley, USA: *Title to be announced.* Aula Magna, SU.

Fr 12–08 kl. 11.00–11.50. Nobelföreläsning i kemi. Roger D. Kornberg, Stanford University School of Medicine, USA: *The molecular basis of eukaryotic transcription.* Aula Magna, SU.

Fr 12–08 kl. 12.15–13.05. Nobelföreläsning i ekonomi. Edmund S. Phelps, Columbia University, USA: *My kind of macroeconomics: Modern economies and their policy choices.* Aula Magna, SU.

Må 12–11 kl. 10.15. Seminarium i teoretisk datalogi. *(Observera tiden och lokalen!)* **Professor Galina L. Rogova,** University of Buffalo, USA: *Higher level fusion for catastrophic events.* Rum 4523, KTH CSC, Lindstedtsvägen 5, plan 5. Se sidan 7.

Professor Rogova är opponent vid Robert Suzićs disputation. Se sidan 10.

Må 12–11 kl. 13.15–14.15. DNA-seminariet Uppsala-KTH (Dynamical systems, Number theory, Analysis). Stephan Baier, International University Bremen: *The Sato-Tate and Lang-Trotter conjectures about elliptic curves on average.* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 11.

Må 12–11 kl. 14.45–15.45. DNA-seminariet Uppsala-KTH (Dynamical systems, Number theory, Analysis). *(Observera tiden och lokalen!)* **Francis Brown,** Institut Mittag-Leffler: *Arithmetic of zeta values and the irrationality of* $\zeta(2)$ *and* $\zeta(3)$. Sal D33, KTH, Lindstedtsvägen 5, b.v. Se sidan 6.

Ti 12–12 kl. 13.15. Docentföreläsning i mekanik. Daniel Söderberg, Mekanik, KTH: *From fibres to paper — a journey through a multiphase state space.* Seminarierummet, Institutionen för mekanik, KTH, Teknikringen 8.

On 12–13 kl. 10.00. Licentiatseminarium i matematik. Mats Oldin presenterar sin licentiatavhandling: *Joint Sequences and Factorizations in Free Monoids, with applications to DNA-sequencing.* Opponent: **Docent Victor Ufnarovski,** Matematiska institutionen, Lunds Tekniska Högskola. Rum 306, hus 6, Matematiska institutionen, SU, Kräftriket. Se sidan 9.

On 12–13 kl. 11.00. Kombinatorikseminarium. Armen Asratian, Linköping: *Title to be announced.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

On 12–13 kl. 11.00. Common SU KoF/KTH Theoretical Physics Seminar. Adan Cabello, University of Sevilla: *Title to be announced.* (The schedule for this seminar is preliminary and is to be confirmed.) Sal FB31, Roslagstullsbacken 21, AlbaNova universitetscentrum.

Fortsättning på nästa sida.

Seminarier (fortsättning)

On 12–13 kl. 13.15 – 14.15. Seminarium i analys och dynamiska system. Alexander Borichev, Marseille: *Title to be announced.* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

To 12–14 kl. 19.00 – 21.00. Populärvetenskaplig julföreläsning i fysik. Carl-Olof Fägerlind och **Max Kesselberg** visar historiska och mindre historiska fysikaliska experiment. *Välkomna till en experimentell exposé i Faradays anda!* Sal FD5 (The Svedbergsalen), Roslagstullsbacken 21, AlbaNova universitetscentrum.

Må 12–18 kl. 13.15 – 15.00 (cirka). Informellt doktorandseminarium i teoretisk datalogi. Johan Håstad, Teorigruppen, KTH CSC: *Verifying proofs by reading only 3 bits (part 2 of 2).* Rum 1537, KTH CSC, Lindstedtsvägen 3, plan 5. Se nedan.

INFORMELLA DOKTORANDSEMINARIER I TEORETISK DATALOGI

Johan Håstad: Verifying proofs by reading only 3 bits (parts 1 and 2)

Abstract: Probabilistically Checkable Proofs or more succinctly PCP's have played a significant role in theoretical computer science lately.

Not only are they interesting in their own right, but they also lead to strong inapproximability results for interesting optimization problems.

As a concrete example take satisfiability of Boolean formulas. A classical NP-proof that a formula is satisfiable is given by an assignment that satisfies the formula, and this is verified by reading the entire proof and checking that indeed the assignment satisfies the formula. In PCP a probabilistic verifier also tries to verify a written proof but is only allowed to do a few random spot checks and may only read a very small portion of the proof.

The PCP-theorem says that for satisfiability and hence for any NP-statement, there is a PCP that allows proofs of polynomial size and such that the verifier reads a constant number of bits, always accepts a correct proof and rejects a proof of a false NP-statement with probability at least 1/2.

In the application to inapproximability it is important to optimize some of the parameters of the PCP, and in particular we will be interested in proofs where the verifier only reads three bits.

The plan is to have an informal and hopefully interactive seminar discussing these issues. We will explain, but not prove the PCP-theorem. We will then see how to change the proof to decrease the number of bits read by the verifier. In the process we will discuss concepts such as Raz parallel repetition theorem and the long code, the longest binary code defined by Bellare, Goldreich and Sudan.

The seminar will be given at the board and depending on audience participation the total duration can be anywhere from one to two double lectures.

If all present understand Swedish, the lectures will be given in Swedish and otherwise in English.

Tid och plats: Del 1 äger rum måndagen den 4 december kl. 13.15 – 15.00 (cirka). Del 2 äger rum måndagen den 18 december kl. 13.15 – 15.00 (cirka). Lokalen för båda seminarierna är rum 1537, KTH CSC, Lindstedtsvägen 3, plan 5.

PLURIKOMPLEXA SEMINARIET

Stefan Nemirovski:
Lagrangian embeddings of the Klein bottle

Abstract: Does the Klein bottle admit a Lagrangian embedding into the standard symplectic four-space? This question, raised by Alexander Givental' in 1986, was answered in the negative by Vsevolod Shevchishin in 2006. The talk will survey the history of this problem and the relation of its solution to the work of Vladimir Rokhlin and several of his students.

Tid och plats: Tisdagen den 5 december kl. 10.15 i sal 64119, Ångströmlaboratoriet, Uppsala universitet.

LOGIKSEMINARIET STOCKHOLM-UPPSALA

Dag Normann:
Domain theory based hierarchies of total functionals

Abstract: In this lecture we will discuss the relationship between three typed hierarchies of total objects, the classical Kleene-Kreisel continuous functionals (the KK-functionals) and two hierarchies over the reals.

One is based on the closed interval representation and the other on the negative binary digit representation, and both are based on domain theory for forming objects of higher type.

The key problem under investigation is whether the two hierarchies over the reals coincide. We will see that this coincidence problem has a counterpart as a topological problem about the KK-functionals. As a technical lemma it is shown that there are topological embeddings of the KK-functionals into both hierarchies over the reals.

We will go into the proofs in some depth, but do not intend to give all details.

Tid och plats: Torsdagen den 7 december kl. 13.15 i sal 11167, Ångströmlaboratoriet, Uppsala universitet.

MITTAG-LEFFLER SEMINAR

Satoshi Minabe:
Topological vertex and local Gromov-Witten invariants of del Pezzo surfaces

Abstract: The local Gromov-Witten (GW) invariants of smooth projective surfaces are rational numbers defined by certain integrals over moduli stacks of stable maps. Those of del Pezzo surfaces are especially important in relation to string theories.

The goal of this talk is to compute local GW invariants of cubic surfaces (i.e. del Pezzo surfaces of degree 3) at all genera. We give an explicit formula for the generating function of these invariants. It has a combinatorial expression in terms of special values of skew-Schur functions.

A main idea is to use the deformation invariance of local GW invariants and reduce the computation to those of a new toric surface, where we can apply the "topological vertex".

This is a joint work with Yukiko Konishi.

Tid och plats: Torsdagen den 7 december kl. 15.30 – 16.30 vid Institut Mittag-Leffler, Auravägen 17, Djursholm.

PLURIKOMPLEXA SEMINARIET

Oleg Viro:
Traces of complex on real

Abstract: Real algebraic varieties lie in their complexifications. Under certain circumstances various structures come to the set of real points from the ambient complex variety. I am going to overview some of these structures and the ways they were used.

Tid och plats: Tisdagen den 5 december kl. 13.15 i sal 64119, Ångströmlaboratoriet, Uppsala universitet.

KTH/SU MATHEMATICS COLLOQUIUM

Nicolai Reshetikhin:
Mathematics of dimer models

Abstract: Dimer models first appeared in statistical mechanics and together with the Ising model were the first exactly solved models of phase transitions. Mathematically, dimer configuration is a perfect matching on vertices of a graph, where matched vertices are connected by edges. A dimer model is a weighted counting of dimer configurations, where the weight of a configuration is the product of the weights of matching edges.

The exact solution was found by Kasteleyn in the 1960's. The partition function of a dimer model on a graph embedded into a surface of genus g is a linear combination of 4^g Pfaffians. The goal of this colloquium talk is to outline combinatorial structures related to dimer models, explain how 4^g terms in the Pfaffian formula for the partition function are related to spin structures on the surface, and to give a short account of recent results on the structure of a random dimer configuration for large graphs.

Tid och plats: Onsdagen den 6 december kl. 16.00 – 17.00 i seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Kaffe/te serveras kl. 15.30 i pausrummet, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 4.

DNA-SEMINARIET UPPSALA-KTH (DYNAMICAL SYSTEMS, NUMBER THEORY, ANALYSIS)

Francis Brown:
Arithmetic of zeta values and the irrationality of $\zeta(2)$ and $\zeta(3)$

Abstract: A folklore conjecture states that the values of the Riemann zeta function at odd positive integers are algebraically independent over $\mathbb{Q}$. The main results in this direction are that $\zeta(3)$ is irrational (Apéry), and that there are infinitely many irrational numbers amongst $\zeta(2n+1)$ (Rivoal). It is not known, however, whether $\zeta(5)$ is irrational or not.

In this talk, I will begin by surveying the known and conjectured diophantine properties of multiple zeta values. I will then explain Beukers' elementary proof that $\zeta(3)$ is irrational, and describe the group structures corresponding to $\zeta(2)$ and $\zeta(3)$, which give the best bounds for their irrationality measures known to date. In the last part of the talk I will explain how the moduli spaces of curves of genus 0 give a unifying geometric interpretation of these proofs.

Tid och plats: Måndagen den 11 december kl. 14.45 – 15.45 i sal D33, KTH, Lindstedtsvägen 5, b.v.

MITTAG-LEFFLER SEMINAR

Timothy Logvinenko:
Construction of crepant resolutions as GIT moduli spaces

Abstract: Let G be a finite subgroup of $SL_n(\mathbf{C})$. In dimension two, the minimal resolution of the quotient singularity $\mathbf{C}2/G$ can be constructed as the G-equivariant Hilbert scheme G-Hilb$\mathbf{C}2$. In dimension three, G-Hilb$\mathbf{C}3$ is a crepant resolution of $\mathbf{C}3/G$, and the other projective crepant resolutions can be constructed, more generally, via GIT theory as fine moduli spaces of certain stable coherent G-sheaves on $\mathbf{C}3$.

Tid och plats: Tisdagen den 5 december kl. 15.30 – 16.30 vid Institut Mittag-Leffler, Auravägen 17, Djursholm.

SEMINARIUM I TEORETISK DATALOGI

Galina L. Rogova:
Higher level fusion for catastrophic events

Abstract: The core purpose of higher level fusion (situation and threat assessment) is to infer and approximate the characteristics and critical events of the environment in relation to specific goals, capabilities and policies of the decision makers. The higher level fusion processes utilize fused data about objects of interest, dynamic databases, maps, and expert knowledge, and opinion for context processing. The result of higher level fusion is a coherent composite picture of the current and predicted situation, which provides human experts with essential information to help them understand and control the situation, and act effectively to mitigate its impact. Situation and threat assessment processing has to be adaptive to resource and time constraints, new and uncertain environments, and reactive to uncertain and unreliable heterogeneous inputs.

The presentation will discuss major challenges, specific requirements, and approaches to designing higher level fusion processes as applied to the problem of crisis management.

The higher level fusion processing described in the presentation exploits synergy between cognitive work analysis and ontological analysis of the specific domain, developed within the framework of a formal ontology. The combination of cognitive work analysis and ontology provides a formally structured and computationally tractable domain representation capturing the basic structures of relevant objective reality and users' domain knowledge and requirements. This domain representation further serves as a basis for generating domain specific situational hypotheses and high-level reasoning about these hypotheses. The dynamic situational picture is built by analysing spatial and temporal relations of the situational entities and entity aggregations at different levels of granularity, and their dynamics provided within the overall situational context. Special attention is paid to "inference for best explanation" aimed at discovery of the underlying causes of observed situational entities and their behaviour. Belief Based Argumentation system, a reasoning framework considered, represents a generalization of Probabilistic Argumentation System. It allows for allocating rational belief in hypotheses about the environment by utilizing given knowledge to find and combine arguments in favour of and against them.

The presented methodology also includes multi-step inter-level and intra-processing information exchange comprising a quality control and a belief update steps.

Tid och plats: Måndagen den 11 december kl. 10.15 i rum 4523, KTH CSC, Lindstedtsvägen 5, plan 5.

KOMBINATORIKSEMINARIUM

Anders Claesson:
Conway's napkin problem

Abstract: The napkin problem was first posed by John H. Conway, and written up as a 'toughie' in *Mathematical Puzzles: A Connoisseur's Collection* by Peter Winkler. To paraphrase Winkler's book, there is a banquet dinner to be served at a mathematics conference. At a particular table, n men are to be seated around a circular table. There are n napkins, exactly one between each of the place settings. Being doubly cursed as both men and mathematicians, they are all assumed to be ignorant of table etiquette. The men come to sit at the table one at a time and in random order. When a guest sits down, he will prefer the left napkin with probability p and the right napkin with probability $q = 1 - p$. If there are napkins on both sides of the place setting, he will choose the napkin he prefers. If he finds only one napkin available, he will take that napkin (though it may not be the napkin he wants). The third possibility is that no napkin is available, and the unfortunate guest is faced with the prospect of going through dinner without any napkin!

We think of the question of how many people do not get napkins as a statistic for signed permutations, where the permutation gives the order in which people sit and the sign tells us whether they initially reach left or right. We also keep track of the number of guests who get a napkin, but not the napkin they prefer. We find the generating function for the joint distribution of these statistics, and use it to answer questions like: What is the probability that every guest receives a napkin? How many guests do we expect to be without a napkin? How many guests are happy with the napkin they receive?

The talk is based on joint work with Kyle Petersen, Brandeis University. The article is to appear in American Mathematical Monthly.

Tid och plats: Onsdagen den 6 december kl. 10.15 – 11.15 i seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

SEMINARIUM I ANALYS OCH DYNAMISKA SYSTEM

Pär Kurlberg:
Lower bounds on the order of some pseudorandom number generators

Abstract: Given coprime integers b and n, let $\mathrm{ord}(b, n)$ be the multiplicative order of b modulo n. The length of the periods of some popular pseudorandom number generators (the power generator, the linear congruential generator, and the Blum-Blum-Shub generator) turns out to be related to $\mathrm{ord}(b, n)$ for appropriately chosen b and n. (Note that the case $n = p$, where p is prime, is related to Artin's primitive root conjecture.) We will give lower bounds on $\mathrm{ord}(b, n)$ for b fixed and n ranging over certain subsets of the integers, e.g., the set of primes, the set of "RSA moduli" (i.e., products of two primes), the full set of integers, and the images of these sets under the "Carmichael lambda function". Assuming the generalized Riemann hypothesis, we can show that the order is essentially maximal for almost all n in the above-mentioned subsets. We can also give weaker unconditional bounds. The lower bounds in the case of RSA moduli shows that certain "cycling attacks" on the RSA crypto system are ineffective.

Tid och plats: Onsdagen den 6 december kl. 13.15 – 14.15 i seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

COMMON SU KOF/ KTH THEORETICAL PHYSICS SEMINAR

Erik Lindahl:
Thermodynamical properties of biological molecules through loosely coupled or distributed simulations: protein folding and insertion in biomembranes

Abstract: High performance computing applications have increased tremendously the last decade or two, and it is now quite possible to simulate many processes that were completely impossible only a few years ago. Yet, many of the most important practical problems occur on scales of length and time that are several orders of magnitude beyond this, particularly in biochemistry/biology. I will present some of the approaches we have used to overcome these limitations, and which have enabled us not only to simulate and model events that were previously considered "impossible", but also doing it with standard hardware instead of supercomputers. This will be illustrated with examples from our recent work on folding of small globular proteins in water as well as understanding the entire process of how amino acids are inserted into bilayers to form membrane proteins, but many of the underlying modelling ideas are universally applicable.

Tid och plats: Onsdagen den 6 december kl. 11.00 i sal FB51, Roslagstullsbacken 21, AlbaNova universitetscentrum.

LICENTIATSEMINARIUM I MATEMATIK

Mats Oldin

presenterar sin licentiatavhandling:

Joint Sequences and Factorizations in Free Monoids, with applications to DNA-sequencing

Opponent: **Docent Victor Ufnarovski,** Matematiska institutionen, Lunds Tekniska Högskola.

Abstract: This paper describes a mathematical framework for rigorously describing and solving problems regarding DNA-sequencing. The main problem regards the reconstruction of a DNA-sequence from several partial descriptions of the sequence. The partial descriptions are modelled by, what we call, *semi-commutative images* of different factorizations of the sequence. It is shown that the information given by multiple semi-commutative images could be represented by a single semi-commutative image obtained by, what is defined as the *join* of the images. This join is an application of a general construction which we define for sequences in a general group. This join is also applied to factorizations and so-called *factorization schemata.* It is shown that the join operation makes the set of factorizations and factorization schemata into boolean algebras. In two appendices the reconstruction problem is reformulated in alternative ways. One uses the framework of fuzzy set theory to model inexactness in the partial information. The other formulates the problem as a completion problem of Parikh matrices.

Tid och plats: Onsdagen den 13 december kl. 10.00 i rum 306, hus 6, Matematiska institutionen, SU, Kräftriket.

SEMINARIUM I MATEMATISK STATISTIK

Anders Björkström:
Predictor construction in multivariate regression:
A framework and some comparisons

Abstract: We demonstrate that a number of well-established multivariate regression methods for prediction are related, in that they are special cases of basically one general procedure. We try a more general method, based on this procedure. In a simulation study, we compare this method to ridge regression, multivariate PLSR and univariate PLSR. We find that ridge regression gives larger prediction errors than the other methods. The general method does somewhat better than PLSR, although at a considerable cost in computer time.

Tid och plats: Onsdagen den 6 december kl. 15.00 – 15.45 i rum 306 (Cramérrummet), hus 6, Matematiska institutionen, SU, Kräftriket.

DISPUTATION I DATALOGI

Robert Suzić

disputerar på avhandlingen

Stochastic Multi-Agent Plan Recognition,
Knowledge Representation and Simulations
for Efficient Decision Making

måndagen den 11 december 2006 kl. 14.00 i sal D2, KTH, Lindstedtsvägen 5, b.v. Till opponent har utsetts *professor Galina L. Rogova,* University of Buffalo, USA.

Abstract of the thesis

Advances in information technology produce large sets of data for decision makers. In both military and civilian efforts to achieve *decision superiority,* decision makers have to act agilely with proper, adequate and relevant information available. Information fusion is a process aimed to support decision makers' situation awareness. This involves a process of combining data and information from disparate sources with *prior* information or knowledge to obtain an improved state estimate about an agent or other relevant phenomena.

The important issue in decision making is not only assessing the current situation but also envisioning how a situation may evolve. In this work we focus on the *prediction* part of decision making called *predictive situation awareness.* We introduce new methodology where simulations and plan recognition are tools for achieving improved predictive situation awareness.

Plan recognition is the term given to the process of inferring an agent's intentions from a set of actions and is intended to support decision making. Beside its main task that is to support decision makers' predictive situation awareness, plan recognition could also be used for coordination of actions and for developing computer-game agents that possess cognitive ability to recognize other agents' behaviour.

Successful plan recognition is heavily dependent on the data that are supplied. Therefore we introduce a *bridge* between plan recognition and sensor management, where results of our plan recognition are reused to the control of, to give *focus of attention* to, the sensors that are expected to acquire the most important/*relevant* information.

Our methodologies include knowledge representation, embedded stochastic simulations, microeconomics, imprecise knowledge and statistical inference issues.

LOGIKSEMINARIET STOCKHOLM-UPPSALA

Jouko Väänänen: Dependence logic

Abstract: Dependence logic is an extension of first order logic, in which dependence of variables on each other is a basic atomic concept. We give an overview of this logic, its properties, and its applications, from database theory to set theory.

Tid och plats: Onsdagen den 6 december kl. 10.30 i sal 64119, Ångströmlaboratoriet, Uppsala universitet.

DNA-SEMINARIET UPPSALA-KTH (DYNAMICAL SYSTEMS, NUMBER THEORY, ANALYSIS)

Stephan Baier: The Sato-Tate and Lang-Trotter conjectures about elliptic curves on average

Abstract: Let E be an elliptic curve over $\mathbb{Q}$. For any prime number p of good reduction, let $\lambda_E(p)$ be the trace of the Frobenius morphism of $E/\mathbb{F}_p$. Then the number of points on the reduced curve modulo p equals $p+1-\lambda_E(p)$. By Hasse's theorem, there exists a unique angle $0 \leq \theta \leq \pi$ such that

$$\lambda_E(p) = \sqrt{p}\left(e^{i\theta_E(p)} + e^{-i\theta_E(p)}\right) = 2\sqrt{p}\cos\theta_E(p).$$

For the case when E does not have complex multiplication, Sato and Tate formulated a conjecture on the distribution of $\theta_E(p)$ as p varies. In a recent preprint, R. E. Taylor succeeded in proving the Sato-Tate conjecture for elliptic curves E that satisfy a certain mild condition.

In this talk, we will discuss the Sato-Tate distribution in *small* sectors on average over a family of elliptic curves. Moreover, we will talk about the Lang-Trotter conjecture on average. The last-mentioned conjecture predicts an asymptotic for the number of primes p with $\lambda_E(p) = r$, where r is fixed.

Some of these results are joined work with Liangyi Zhao.

Tid och plats: Måndagen den 11 december kl. 13.15 – 14.15 i seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

MONEY, JOBS

Columnist: Eric Emtander, Department of Mathematics, SU. E-mail: erice@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/~erice/mj.html.
Unless stated otherwise, a given date is the last date (e.g. for applications), and the year is 2006. 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.

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5. Stockholm University site for information on funds: http://www2.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. KTH söker en biträdande lektor i numerisk analys. Tjänsten är placerad vid Skolan för datavetenskap och kommunikation. Den är tidsbegränsad till fyra år med möjlighet till förlängning. Forskningen inriktas mot metod- och programutveckling för krävande matematiska modeller med specialisering inom någon disciplin såsom materialvetenskap, elektromagnetism, biokemi eller mjukvaruteknologi för högpresterande datorer eller mot analys och metodutveckling. Behörig att anställas som biträdande lektor är den som avlagt doktorsexamen eller har en utländsk examen som bedöms motsvara doktorsexamen. I första hand bör den komma i fråga som har avlagt examen högst fem år före ansökningstidens utgång. Sista ansökningsdag är den 12 januari 2007. Web-info: http://www.kth.se/aktuellt/tjanster/2/ShowAdd.aspx?ID=74553.

Old information

Money to apply for

12. Stiftelsen Riksbankens Jubileumsfond utlyser två resestipendier om vardera cirka 100 000 kr ur Nils-Eric Svenssons Fond för att ge yngre disputerade svenska forskare inom Riksbanksfondens verksamhetsområde möjlighet att resa till och under kortare tid vistas i en framstående europeisk forskningsmiljö. Den sökande skall ha disputerat under år 2003 eller senare, får ej vara äldre än 40 år, skall vara anknuten till en forskningsenhet inom ett universitet och skall ha fått en inbjudan från den forskningsenhet som han/hon ämnar resa till. Sista ansökningsdag är den 18 januari 2007. Web-info: http://www.rj.se/FileArchive/45430.pdf.
13. 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.
14. Från Vetenskapsrådet kan konferensbidrag sökas med huvudsyftet att göra det möjligt att inbjuda framstående utländska föredragshållare. Ansökan skall vara inkommen senast två månader innan konferensen äger rum. Ansökningar behandlas ej mellan den 15 juni och den 15 augusti. Info: Mona Berggren, 08-546 44 246, e-post Mona.Berggren@vr.se. Web-info: http://www.vr.se/forskning/bidrag/ovrbidrag.jsp?resourceId=822&languageId=1.
15. Stiftelsen för internationalisering av högre utbildning och forskning (STINT) erbjuder korttidsstipendier: 2 veckor till 3 månader långa besök. Stipendierna är avsedda för besök vid utländska institutioner, alternativt för att bjuda in en utländsk forskare. De kan ej sökas av doktorander. Ansökan kan göras löpande under året. Info: Agneta Granlund, 08-671 19 95, e-post agneta.granlund@stint.se. Web-info: http://www.stint.se/index.php?articleId=34.
16. Från Vetenskapsrådet kan resebidrag sökas av främst disputerade forskare, av doktorander i undantagsfall. Bidrag kan bland annat sökas för konferensdeltagande (ej posterpresentation), för att representera Sverige i viktiga sammanhang samt för att bjuda in utländska gästforskare. Bidrag för resa till internationellt forskningssamarbete kan också få finansiering. Ansökan skall vara inkommen senast två månader innan resan äger rum. Ansökningar behandlas ej mellan den 15 juni och den 15 augusti. Info: Mona Berggren, 08-546 44 246, e-post Mona.Berggren@vr.se. Web-info: http://www.vr.se/forskning/bidrag/ovrbidrag.jsp?resourceId=665&languageId=1.

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17. Wenner-Gren Stiftelserna utlyser gästföreläsaranslag som ger institutioner bidrag till att bjuda in utländska gästföreläsare m.m. Ansökan kan inlämnas när som helst under året. Web-info: http://www.swgc.org/.
18. Vetenskapsrådets utbildningsvetenskapliga kommitté utlyser konferens- och resebidrag för i första hand unga och/eller nydisputerade forskare. Bidrag kan sökas när som helst under året. Web-info: http://www.vr.se/omvr/organisation/sida.jsp?unitId=24.
19. Svenska institutet ger bidrag för utbildning och forskning utomlands. Sista ansökningsdag varierar för olika länder. Web-info: Se punkt 10 ovan.

Jobs to apply for

20. Umeå universitet söker en professor i statistik. Personen kommer att leda forskning och utveckling vid institutionen samt förväntas aktivt söka externa medel. Vid urvalet av de sökande beaktas i första hand vetenskaplig kompetens, sedan pedagogisk. Sista ansökningsdag är den 7 december. Web-info: http://www.umu.se/umu/aktuellt/arkiv/lediga_tjanster/311-3989-06.html.
21. Fraunhofer-Chalmers centrum för industrimatematik (FCC), Göteborg, söker en person med doktorsexamen för att stärka sitt program inom simuleringsbaserad optimering. Den sökande skall ha specialistkompetens inom optimering och partiella differentialekvationer samt erfarenhet av tekniska beräkningar inom minst ett av områdena fluiddynamik, elektromagnetism eller strukturmekanik. Den sökande bör behärska programvara som Matlab och något programmeringsspråk. Även affärsmässighet, kunskap om den svenska marknaden och industriella erfarenheter värdesätts. Vidare söker man en eller två civilingenjörer eller motsvarande med god teoretisk förståelse och förmåga att omsätta avancerade beräkningsmetoder i effektiv programvara. Sista ansökningsdag är den 8 december. Web-info: http://www.fcc.chalmers.se.
22. FCC söker en eller flera personer med stor talang för några av områdena matematik, fysiksimulering, geometri, datorgrafik, avancerad algoritmutveckling, robotteknik och optimering. Arbetet kommer att handla om metoder, tekniker och mjukvara för virtuell utveckling och verifiering inom i första hand bilindustrin. Sista ansökningsdag och web-info: Se punkt 21.
23. FCC söker en person för vidareutveckling av programvara för grafisk modellering, simulering och andra analyser av biokemiska reaktionsnätverk. Arbetet är självständigt och består av implementering av ny funktionalitet baserad på bl.a. forskning inom avdelningen. Sista ansökningsdag och web-info: Se punkt 21.
24. Karlstads universitet söker en biträdande lektor i matematik med didaktisk inriktning. Tjänsten är tidsbegränsad till fyra år. Sista ansökningsdag är den 1 december. Web-info: http://www.kau.se/aktuellt/lediga_anstallningar/index.lasso?to_do=detail&tjanst_id=1874.
25. The University Science Institute på Island utlyser en forskartjänst inom matematik eller matematisk fysik. Företräde ges till den som, relativt institutionen, har överensstämmande forskningsinriktning (se http://www.raunvis.hi.is/Staerdfr/Staerdfr.html/). Sista ansökningsdag är den 1 december. Web-info: http://www.raunvis.hi.is/Staerdfr/Jobs/res-scientist.html.
26. Högskolan Dalarna och Statens Väg- och transportforskningsinstitut (VTI) söker tillsammans dels en universitetslektor i statistik (tillsvidareanställning), dels en biträdande universitetslektor i statistik (tjänsten är tidsbegränsad till fyra år med möjlighet till förlängning). Båda tjänsterna är placerade i Borlänge och har sista ansökningsdag den 15 december. Web-info: http://www.du.se/templates/NewsPage____6454.aspx respektive http://www.du.se/templates/NewsPage____6453.aspx.