BRÅKET

Information om seminarier och högre undervisning i matematiska ämnen i Stockholmsområdet

NR 23 **FREDAGEN DEN 15 JUNI 2007**

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 16 augusti kl. 13.00.

Enigma Conference on Mathematical Physics

Denna äger rum vid KTH den 25 – 28 juni. Se sidan 5.

Högre undervisning

En preliminär lista över högre kurser i matematik vid KTH och SU under höstterminen 2007 finns på sidan 5.

SEMINARIER

Fr 06–15 kl. 11.00 – 12.00. Optimization and Systems Theory Seminar. Jonathan F. Bard, The University of Texas at Austin, USA: *Cyclic nurse scheduling using a bundle method.* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 3.

Fr 06–15 kl. 13.15 – 14.15. Presentation av examensarbete i matematik (20 poäng, fördjupningsnivå). *(Observera dagen och tiden!)* **Elin Ottergren:** *Linear preservers of hyperbolic and stable polynomials.* Handledare: **Julius Borcea.** Sal 21, hus 5, Matematiska institutionen, SU, Kräftriket. Se Bråket nr 22 sidan 6.

Må 06–18 kl. 15.15 – 16.00. Seminarium i finansiell matematik. Kristofer Ericson presenterar sitt examensarbete: *Modelling Aspects in Credit Investments.* Seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 2.

Fortsättning på nästa sida.

Presentation av Wallenbergprojektet

Denna äger rum vid KTH den 19 september. Se sidan 6.

Ledig tjänst

SU söker en biträdande lektor i matematik. Se sidan 2.

Trevlig sommar

önskas Bråkets läsare. Nästa nummer utkommer fredagen den 17 augusti.

Money, jobs: Se sidan 6.

Seminarier (fortsättning)

Ti 06–19 kl. 11.00 – 12.00. Joint CIAM and Optimization and Systems Theory Seminar. *(Observera dagen!)* **Edwin Romeijn,** University of Florida, USA: *Radiation therapy treatment plan optimization.* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 3.

Ti 06–19 kl. 15.30 – 16.30. AlbaNova and Nordita Colloquium in Physics — The 2007 Oskar Klein Memorial Lecture. Professor Gabriele Veneziano, Cern och Collège de France: *Title to be announced.* Oskar Kleins auditorium, Roslagstullsbacken 21, AlbaNova universitetscentrum.

On 06–27 kl. 13.15. Seminarium i teoretisk datalogi. Marieke Huisman, INRIA Sophia Antipolis: *Towards modular verification of concurrent object-oriented programs.* Rum 1537, KTH CSC, Lindstedtsvägen 3, plan 5. Se sidan 4.

Fr 06–29 kl. 13.15 – 14.15. DNA-seminariet Uppsala-KTH (Dynamical systems, Number theory, Analysis). Nathan Jones, Centre de Recherches Mathématiques, Université de Montréal, Canada: *The square-free sieve and elliptic curve constants.* Seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7. Se sidan 4.

SEMINARIUM I FINANSIELL MATEMATIK

Kristofer Ericson

presenterar sitt examensarbete:

Modelling Aspects in Credit Investments

Abstract: Following standard concepts and techniques, this thesis provides a framework for modelling credit risk, i.e. the risk that the value of a portfolio changes due to unexpected changes in the quality of issuers. As a first step we aim to forecast bond indices, chosen to represent investments of varying risk exposure. In order to make the modelling as realistic as possible, we incorporate the concept of credit migration and defaults. This is an attempt to capture how debt changes credit quality or in worst case, defaults. Finally, we generate scenarios and study the statistical properties of the return of our investments.

Tid och plats: Måndagen den 18 juni kl. 15.15 – 16.00 i seminarierum 3733, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

Ledig tjänst

Stockholms universitet söker en biträdande lektor i matematik med placering vid Matematiska institutionen.

Tjänsten har referensnummer 613-1016-07. Sista ansökningsdag är måndagen den 10 september 2007.

Upplysningar om anställningen lämnas av professor Mikael Passare, telefon 08-16 45 46, e-post passare@math.su.se. Frågor om anställningsförfarandet kan ställas till handläggaren, Bibi Pehrson, telefon 08-16 22 92, e-post bibi.pehrson@natkan.su.se.

OPTIMIZATION AND SYSTEMS THEORY SEMINAR

Jonathan F. Bard:
Cyclic nurse scheduling using a bundle method

Abstract: This talk addresses the problem of developing cyclic schedules for nurses while taking into account the quality of individual assignments. In this context, quality is gauged by the absence of certain undesirable shift patterns. The problem is formulated as an integer program (IP) and then decomposed using Lagrangian relaxation. Two approaches were explored, the first based on the relaxation of the preference constraints and the second based on the relaxation of the demand constraints. A theoretical examination of the first approach indicated that it was not likely to yield good bounds. The second approach showed more promise and was subsequently used to develop a solution methodology that combined subgradient optimization, the bundle method, heuristics, and variable fixing. After the Lagrangian dual problem was solved, though, there was no obvious way to perform branch and bound when a duality gap existed between the lower bound and the best objective function value provided by an IP-based feasibility heuristic. This led to the introduction of a variable fixing scheme to speed convergence. The full algorithm was tested on data provided by a medium size United States hospital. Computational results showed that in most cases problem instances with up to 100 nurses and 20 rotational profiles could be solved to near optimality in less than 20 minutes.

Tid och plats: Fredagen den 15 juni kl. 11.00 – 12.00 i seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

JOINT CIAM AND OPTIMIZATION AND SYSTEMS THEORY SEMINAR

Edwin Romeijn:
Radiation therapy treatment plan optimization

Abstract: We consider the problem of determining high-quality radiation therapy treatment plans for cancer patients. Since radiation therapy kills both cancerous and normal cells, the treatment must be carefully planned so that a clinically prescribed dose is delivered to cancerous cells while sparing normal cells in nearby organs and tissues to the greatest extent possible. We formulate an integrated model for intensity modulated radiation therapy (IMRT) treatment plan optimization that incorporates several treatment delivery aspects that have to date mainly been handled in a post-processing phase. We develop a column generation algorithm for solving this problem and study four variants of the associated pricing problem. We present results on clinical cases that indicate that this approach can be used to not only find high-quality treatment plans that can be delivered more efficiently than current plans, but also to help make a trade-off between treatment plan efficiency and quality.

Tid och plats: Tisdagen den 19 juni kl. 11.00 – 12.00 i seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

SEMINARIUM I TEORETISK DATALOGI

Marieke Huisman:
Towards modular verification of concurrent object-oriented programs

Abstract: Modular static verification of concurrent object-oriented programs remains a challenge. This talk discusses the impact of concurrency on the use of standard program-logic-based verification techniques.

Atomicity of methods is often advocated as a solution to the problem of verification of multithreaded programs. However, we show that in a design-by-contract framework atomicity in itself is not sufficient, because it does not consider specifications. Instead, we propose to use the notion of stability of method contracts, to allow sound modular reasoning about method calls. A contract is stable if it cannot be broken by interferences from concurrent threads.

We explain why stability of contracts cannot always be shown directly, and we speculate about different approaches to prove stability. One approach that we will detail further is the use of an annotation system to describe object capacities and locking policies. The annotation system can be used to specify how many threads simultaneously can access an object. The annotation system distinguishes between read-write accesses and read-only accesses, thus offering fine-grained concurrency control. The locking policy of an object describes which locks must be held, before accessing it. The annotation system can express how ownership may be transferred or split between different threads.

The information that is given by the annotations can be exploited to verify other properties of the application. In particular, if an object is known to be local to a thread, sequential verification techniques can be used to verify functional correctness of its methods. We finish by outlining how a proof obligation generator for sequential programs can be extended to one for concurrent programs by using stability information.

This talk does not present a full technical solution to the problem, but instead describes work in progress. It shows how the verification problem can be decomposed into several smaller subproblems. For each subproblem, a solution is sketched, but the technical details still need to be worked out.

The talk is based on joint work with Clement Hurlin.

Tid och plats: Onsdagen den 27 juni kl. 13.15 i rum 1537, KTH CSC, Lindstedtsvägen 3, plan 5.

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

Nathan Jones:
The square-free sieve and elliptic curve constants

Abstract: Let E be an elliptic curve defined over the rational numbers. For a prime p of good reduction for E, let E_p denote the reduction of E modulo p. There are many conjectures which give precise asymptotics for functions which count the number of primes p up to x for which E_p has some desired property (e.g. its number of points is prime or is equal to $p+1-r$ for a fixed integer r). In this talk I will use a square-free sieve of Hooley to study the constants appearing in these asymptotic formulas.

Tid och plats: Fredagen den 29 juni kl. 13.15 – 14.15 i seminarierum 3721, Institutionen för matematik, KTH, Lindstedtsvägen 25, plan 7.

ENIGMA CONFERENCE ON MATHEMATICAL PHYSICS

The lectures of this conference will start on Monday morning at 9.00 (June 25), and the last lectures will be given on Thursday afternoon (June 28). Place for the lectures: Room D3, KTH, Lindstedtsvägen 5, ground floor. Everybody who is interested is welcome to attend the lectures.

The program of the conference is given at http://www.math.kth.se/emp/.

Preliminär lista över högre kurser i matematik vid KTH och Stockholms universitet under höstterminen 2007

Fördjupningskurser

Algebra II, SF2706.
Lärare: Skjelnes.
Plats: KTH.

Integrationsteori, SF2709.
Lärare: Shahgholian.
Plats: KTH.

Partiella differentialekvationer.
Lärare: (Meddelas senare.)
Plats: SU.

Representationsteori.
Lärare: (Meddelas senare.)
Plats: SU.

Doktorandkurser

Fraktal geometri och måtteori.
Lärare: Benedicks.
Plats: KTH.

Delrumsarrangemang.
Lärare: Linusson.
Plats: KTH.

Vektorbuntar och karakteristiska klasser.
Lärare: Chachólski.
Plats: KTH.

Stokastisk analys.
Lärare: Kolsrud.
Plats: KTH.

Kommutativ algebra.
Lärare: (Meddelas senare.)
Plats: SU.

Flera komplexa variabler.
Lärare: Björk och Passare.
Plats: SU.

Presentation av Wallenbergprojektet

Institutionen för matematik, KTH, har fått ett stort anslag från Knut och Alice Wallenbergs Stiftelse för att stärka forskningen och forskningsmiljön. Sedan den 1 januari 2007 och fem år framåt drivs med stöd av dessa medel ett projekt vid avdelningen för matematik. Finansieringen gäller doktorander, postdocs, forskningsassistenter/biträdande lektorer, gästforskare, kollokvier/workshops, m.m.

Onsdagen den 19 september kommer Wallenbergprojektet att presenteras för institutionens medlemmar. Vi tänker oss ett mycket informellt program, cirka kl. 14.15 – 17.00, med korta presentationer av de olika forskningsgruppernas verksamhet och med allmän information om projektet. Därefter följer mat och dryck i pausrummet.

Alla är hjärtligt välkomna. Vik redan nu eftermiddagen och kvällen den 19 september för denna presentation.

För ledningsgruppen
Anders Björner

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 2007. 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://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.

Old information

Jobs to apply for

11. Lunds universitet/Lunds Tekniska Högskola söker en doktorand i matematik med inriktning mot biologisk modellering. Sista ansökningsdag är den 21 juni. Web-info: http://www.lth.se/omlth/ledigatjanster/?aid=432.
12. Högskolan i Kalmar utlyser två doktorandtjänster i matematik: en med inriktning mot dynamiska system och en med inriktning mot differentialgeometri och global analys. Sista ansökningsdag är den 18 juni. Web-info: http://www.hik.se/jobs/cgi-bin/Free_Jobs.exe.
13. Blekinge Tekniska Högskola söker en doktorand inom matematik med tillämpningar. Sista ansökningsdag är den 18 juni. Web-info: http://www.bth.se/for/tjanster.nsf/lediga/.
