Computational Complexity

Eighteenth Annual IEEE Conference

Sponsored by

The IEEE Computer Society Technical Committee on Mathematical Foundations of Computing

In cooperation with

ACM-SIGACT and EATCS

July 7–10, 2003

Århus, Denmark

ELECTRONIC REGISTRATION

The registration for CCC'03 is web based. Please register at http://www.brics.dk/Complexity2003/.

Registration Fees (In Danish Kroner)

	Advance[†]	Late
Members[‡*]	1800 DKK	2200 DKK
Nonmembers[*]	2200 DKK	2800 DKK
Students[+]	500 DKK	600 DKK

[*]The registration fee includes a copy of the proceedings, receptions Sunday and Monday, the banquet Wednesday, and lunches Monday, Tuesday and Wednesday.

[+]The registration fee includes a copy of the proceedings, receptions Sunday and Monday, and lunches Monday, Tuesday and Wednesday. The banquet Wednesday is not included.

[†]The advance registration deadline is June 15.

[‡]ACM, EATCS, IEEE, or SIGACT members.

Extra proceedings/banquet tickets

Extra proceedings are 350 DKK. Extra banquet tickets are 300 DKK. Both can be purchased when registering and will also be available for sale on site.

Alternative registration

If electronic registration is not possible, please contact the organizers at one of the following:

E-mail: complexity2003@brics.dk

Mail: Complexity 2003
c/o Peter Bro Miltersen
Department of Computer Science
University of Aarhus
Ny Munkegade, Building 540
DK 8000 Aarhus C, Denmark

Fax: (+45) 8942 3255

Conference homepage

Information about this year's conference is available on the Web at

  http://www.brics.dk/Complexity2003/

Information about the Computational Complexity conference is available at

  http://computationalcomplexity.org/

Lodging

Blocks of rooms have been reserved for participants at various hotels. Detailed information is available at the conference web site. The rooms are available for reservation on a first come, first served basis until **June 1st**. A reservation request should be made at the web site when registering. These will then be forwarded to the hotel. We will notify you whether your demand can be satisfied or not by e-mail. Since the hotel registrations are handled manually by BRICS, it may take a few days before you get a confirmation by email. Payment is to be arranged directly with the hotel upon arrival.

Conference Information

Location All sessions of the conference and the Kolmogorov workshop will be held in Auditorium F of the Department of Mathematical Sciences at Aarhus University, Ny Munkegade, building 530, 1st floor. A detailed map of the University indicating the location of the Auditorium and the social events is provided at the conference web site.

The university campus is situated in a 100 acre beautiful park area only 2km from the centre of the city. Aarhus (Århus) itself is the capital of the Jutland peninsula, and the second largest city in Denmark with 285,000 inhabitants. It has an outstanding location, encircled by woods, and bordered by beaches the city lies in a shielded spot inviting you to enjoy its extensive attractions. Best known and treasured is the open-air museum "The Old Town" with more than 75 half-timbered houses from every part of Denmark. The city centre offers many different kinds of shopping, small specialised shops as well as larger shopping centres. If you get thirsty or hungry it is easy to find a nice cafe, bar, pub or restaurant.

July is normally the warmest and sunniest month in Denmark. Daytime temperatures could be 20-25 degrees Celsius with somewhat cooler evenings (but could also be somewhat lower or somewhat higher). Occasional showers can be expected.

Further information about Aarhus and Denmark can be found at the conference web site.

Social Program *Sunday evening:* Welcome reception from 7pm to 9pm at the staff lounge of the Department of Computer Science, Ny Munkegade, Building 540, 2nd floor.

Monday evening: Reception at Aarhus City Hall hosted by the City of Aarhus, starting at 6:30pm.

Wednesday afternoon: Business meeting, starting at 4pm, in Auditorium F.

Wednesday evening: Banquet starting at 7pm at "Fysisk kantine", Department of Physics, University of Aarhus, Langelandsgade, Building 520, 7th floor.

Getting There and Getting Around

Visa Requirements: Anyone visiting Denmark for short periods of time from a country with a visa requirement for entering Denmark must obtain a visa before arriving. Such countries are listed at

www.udlst.dk. A visa application must be submitted via a Danish representative office: in other words, an embassy or general consulate abroad. Application forms can be obtained at the representative office. A visa normally grants the holder a right to stay in the entire Schengen region: Belgium, France, Greece, Iceland, Italy, Luxembourg, Holland, Portugal, Germany, Spain, Austria, Denmark, Finland, Norway and Sweden.

The average processing time for business visas is said to be 14 days, but is known to sometimes be significantly longer. Hence, it is advisable to apply for a visa well in advance of the conference.

By airplane: Aarhus is served by two airports, Aarhus Airport and Billund Airpot.

Aarhus Airport (www.aar.dk) has arrivals from Copenhagen, London, Oslo, Stockholm and Gothenburg. The London flights are from Stansted and are operated by Ryanair, flights have to be booked directly with Ryanair either online or by phone. Other flights into Aarhus Airport are operated by SAS and British Airways (others) and can be booked through a travel agent. It is a 40 minute bus ride to get to the centre of Aarhus from the airport. The price is around 60 DKK to be paid in cash to the driver.

Billund Airport (www.billund-airport.com) is much larger and has arrivals from Amsterdam, Frankfurt, Paris, Berlin, London, Brussels, Dublin, Copenhagen and many other European cities. The bus ride into the center of Aarhus takes 1 hour and 20 minutes and costs around 130 DKK to be paid in cash to the driver.

There are also direct trains from Copenhagen Airport (http://www.cph.dk/) to Aarhus Central Station that take approximately 3.5 hours.

By train: The main train station in Aarhus is in the center of the city. There is a direct service from Copenhagen to Aarhus which takes about 3 hours, with at least one train an hour.

Local transportation: Once in Aarhus, you may get around by foot or by using the local yellow bus lines. You should enter at the back of the bus and use the coin operated ticket dispenser to purchase a ticket for around 14 DKK. The ticket is valid for two hours and permits an unlimited number of changes. You can also buy a multi-ride ticket; these are available at most newspaper outlets and at the main train station. Bus lines 4, 7, and 17 have stops close to the university and Auditorium F. A detailed map and descriptions of the best way to get to the conference site by bus from the various hotels is provided at the web site.

Additional Information

Sponsors The conference is sponsored by the IEEE Computer Society Technical Committee for Mathematical Foundations of Computing in cooperation with ACM, SIGACT and EATCS. We kindly acknowledge the support of BRICS (Basic Research in Computer Science, a Centre of the Danish National Research Foundation), the Faculty of Science at the University of Aarhus and the City of Aarhus.

Local Arrangements
The organizers may be contacted by:

E-mail: complexity2003@brics.dk
Mail: Complexity 2003
        c/o Peter Bro Miltersen
        Department of Computer Science
        University of Aarhus
        Ny Munkegade, Building 540
        DK 8000 Aarhus C, Denmark
Fax: (+45) 8942 3255

Complexity Abstracts

Each year, brief abstracts on current research on topics covered by the conference are made available electronically a week before the conference. Submission is open to all. June 30th is the submission deadline. For details of submissions format please see the Complexity web site http://computationalcomplexity.org/.

Committees

Local Arrangements Gerth Stølting Brodal, Uffe H. Engberg, Ulrich Kohlenbach, Peter Bro Miltersen (chair), Karen K. Møller, Sven Skyum.

Program Committee Harry Buhrman (chair) (CWI and U. of Amsterdam), David Barrington (U. of Massachusetts), Maria Luisa Bonet (UPC Barcelona), Oded Goldreich (Weizmann Institute of Science), Johan Håstad (Royal Inst. of Technology,

Stockholm), Steve Homer (Boston U.), Ilan Newman (Haifa U.), Marcus Schaefer, DePaul U., Gábor Tardos (Rényi Institute, Budapest), Nikolai Vereshchagin (Moscow State U).

Conference Committee Lance Fortnow (chair), Manindra Agrawal, Pierre McKenzie, Toni Pitassi, Alexander Razborov, John Rogers, Michael Saks.

SUNDAY: KOLMOGOROV DAY

Complexity, Information, and Randomness: The Legacy of Andrei Kolmogorov

This is a special session given in honor of the 100th anniversary of the birth of Andrei N. Kolmogorov and consisting of talks given by invited speakers. Everyone is welcome to attend. Registration for the Complexity conference is **not** required but free registration for this day is required and is done through the local arrangements web site http://www.brics.dk/Complexity2003/. All talks for this session will be held in Auditorium F of the Department of Mathematical Sciences at Aarhus University, Ny Munkegade, building 530, 1st floor.

Funding for this session is provided by BRICS (University of Aarhus) and LRI (Université Paris-Sud) and we gratefully acknowledge their support.

LIST OF TALKS

Times are yet to be determined. Please check the Complexity web site.

Kolmogorov Complexity and Computational Complexity Theory, Harry Buhrman (CWI, Amsterdam)

"Three Approaches to the Quantitative Definition of Information" After (Almost) Forty Years, Alexander Shen (IITP, Moscow)

Kolmogorov's Structure Functions with an Application to the Foundations of Model Selection, Nikolai Vereshchagin (Moscow State University)

Predictive Complexity, Information, and Randomness, Volodya Vovk (RHUL, London)

19:00 RECEPTION, Staff Lounge, Department of Computer Science, Ny Munkegade, Building 540, 2nd floor.

CONFERENCE PROGRAM

All sessions of the conference will be held in Auditorium F of the Department of Mathematical Sciences at Aarhus University, Ny Munkegade, building 530, 1st floor.

MONDAY, July 7th

SESSION 1 Chair: Harry Buhrman, CWI and U. of Amsterdam

9:00–9:30 *Extremal properties of polynomial threshold functions*, Ryan O'Donnell and Rocco Servedio

9:30–10:00 *Bounded Nondeterminism and Alternation in Parameterized Complexity Theory*, Yijia Chen and Joerg Flum and Martin Grohe

10:00–10:30 Break

SESSION 2 Chair: Harry Buhrman, CWI and U. of Amsterdam

10:30–11:00 *Uniform Hardness vs. Randomness Tradeoffs for Arthur-Merlin Games*, Dan Gutreund and Ronen Shaltiel and Amnon Ta-Shma

11:00–11:30 *A zero-one law for RP*, Russell Impagliazzo and Philippe Moser

11:30–12:00 *Hardness vs. Randomness within Uniform* AC_0, Emanuele Viola

SESSION 3 Chair: Steve Homer, Boston U.

13:45–14:15 *Lower bounds for predecessor searching in the cell probe model*, Pranab Sen

14:15–14:45 *Minimization of Decision Trees is Hard to Approximate*, Detlef Sieling

14:45–15:15 *Optimal Separation of EROW and CROW PRAMs*, Navin Goyal and Michael Saks and S. Venkatesh

15:15–15:45 Break

SESSION 4 Chair: Steve Homer, Boston U.

15:45–16:15 *Near-Optimal Lower Bounds on the Multi-Party Communication Complexity of Set Dis-*

jointness, Amit Chakrabarti and Subhash Khot and Xiaodong Sun

16:15–16:45 *Rectangle Size Bounds and Threshold Covers in Communication Complexity*, Hartmut Klauck

16:45–17:15 *The complexity of Unique k-SAT: An isolation lemma for k-CNFs*, Chris Calabro and Russell Impagliazzo and Valentine Kabanets and Ramamohan Paturi

18:30   RECEPTION at Aarhus City Hall and hosted by the City of Aarhus.

TUESDAY, July 8th

SESSION 5 Chair: Ilan Newman, Haifa U.

9:00–10:00 *Invited talk by Rod Downey*

10:00–10:30 Break

SESSION 6 Chair: Ilan Newman, Haifa U.

10:30–11:00 *Quantum Certificate Complexity*, Scott Aaronson

11:00–11:30 *Quantum decision trees and semidefinite programming*, Howard Barnum and Michael Saks and Mario Szegedy

11:30–12:00 *On Statistical Query Sampling and NMR Quantum Computing*, Avrim Blum and Ke Yang

SESSION 7 Chair: Marcus Schaefer, DePaul U.

13:45–14:15 *Derandomization and Distinguishing Complexity*, Eric Allender, Michal Koucky, Detlef Ronneburger, Sambuddha Roy

14:15–14:45 *Extracting the Mutual Information for a Triple of Binary Strings*, Andrei E. Romashchenko

14:45–15:15 *The complexity of stochastic sequences*, Wolfgang Merkle

15:15–15:45 Break

SESSION 8 Chair: Gábor Tardos, Rényi Institute, Budapest

15:45–16:15 *A Combinatorial Characterization of Resolution Width*, Albert Atserias and Victor Dalmau

16:15–16:45 *Memoization and DPLL: Formula Caching Proof Systems*, Paul Beame and Russell Impagliazzo and Toniann Pitassi and Nathan Segerlind

16:45

Rump Session

WEDNESDAY, July 9th

SESSION 9 Chair: Nikolai Vereshchagin, Moscow State U.

9:00–10:00 *Invited talk by Johan Håstad*

10:00–10:30 Break

SESSION 10 Chair: Nikolai Vereshchagin, Moscow State U.

10:30–11:00 *Holographic Proofs and Derandomization*, Rahul Santhanam and Dieter van Melkebeek

11:00–11:30 *Three-Query PCPs with Perfect Completeness over non-Boolean Domains*, Lars Engebretsen and Jonas Holmerin

11:30–12:00 *List decoding with side information*, Venkatesan Guruswami

SESSION 11 Chair: Johan Håstad, Royal Institute of Technology, Stockholm

13:45–14:15 *Disjoint NP-Pairs*, Christian Glaßer and Alan L. Selman and Samik Sengupta and Liyu Zhang

14:15–14:45 *Are Cook and Karp Ever the Same?*, Richard Beigel and Lance Fortnow

14:45–15:15 *Universal Languages and the Power of Diagonalization*, Alan Nash and Russell Impagliazzo and Jeff Remmel

15:15–15:45 *Proving SAT does not have Small Circuits with an Application to the Two Queries Problem*, Lance Fortnow and A. Pavan and Samik Sengupta

16:00   Business meeting

19:00   Banquet

THURSDAY, July 10th

SESSION 12 Chair: David Barrington, U. of Massachusetts

9:00–10:00   *Invited talk by Manindra Agrawal*

10:00–10:30 Break

SESSION 13 Chair: David Barrington, U. of Massachusetts

10:30–11:00 *Improved Inapproximability of Lattice and Coding Problems with Preprocessing*, Oded Regev

11:00–11:30 *A Strong Inapproximability Result for a Generalization of Minimum Bisection*, Jonas Holmerin and Subhash Khot

11:30–12:00 *Vertex Cover Might be Hard to Approximate to within* $2-\epsilon$, Subhash Khot and Oded Regev