The Seventh Biennial

SCANDINAVIAN WORKSHOP on ALGORITHM THEORY

July 5-7, 2000
Bergen, Norway

Supported by:
The Research Council of Norway
and City of Bergen.

http://www.ii.uib.no/swat2000

General Information - Please read

Registration

You will find a manned registration desk at Hotel Terminus starting 15:30 on Tuesday afternoon, before the reception. You will be given a folder containing all material, and also a copy of the Springer-Verlag proceedings.

Map of Bergen

In your folder you find a small map of Bergen (similar to the one found on the SWAT web page, but not equal, as the numbers have been updated.) All references to locations in the text below include a pointer to this map.

Presentations

Due to the large number of talks and our desire to run SWAT with single sessions, time is tight throughout, with no room for delays. Presentations are scheduled with 20-minute intervals, which means that there is a maximum of about 18 minutes for each presentation. The session chairs will allow questions only if time permits. Participants are requested to return to the lecture hall in good time before each session starts. Participants who need high-tech presentation support, *i.e.* not just an overhead projector, must contact the organizers in good time for a test on the day before their presentation.

Fee

The conference fee is 2000 NOK for regular attendees and 1200 NOK for students (1 USD 8.4 NOK). Note, the price increases with 500 NOK after May 22. The fee includes buffet lunches, coffee breaks, a reception, a copy of the proceedings, and the conference dinner.

Location and Accommodation

The conference will be held at Hotel Terminus in the center of Bergen. Area E-4 on the map, small blue square marked H.Terminus. All presentations will be in the Terminus Hall, and all lunches in the main dining room. We have reserved a number of rooms at special prices for the conference. The price for a single room is 650 NOK and 900 NOK for a double room per night. This also includes breakfast. Rooms at Hotel Terminus are ordered through the conference and should be paid upon departure. The hotel accepts all major credit cards.

Reception

On Tuesday July 4th at 18:00, the day before the conference starts, there will be a welcoming reception hosted by the City of Bergen. The reception will be held in the old Hanseatic assembly rooms called Schøttstuene. Area C-4, black circled 4 on the map. Either find your own way there, or follow a guided walk leaving Terminus at 17:30 (remember umbrella if the weather is uncertain).

Banquet

The dinner will be held Thursday July 6th at 20:00 on Mount Fløyen to where we travel by funicular. In your folder you will find a ticket that will take you both up and down with the funicular. The funicular station is in area D-4, black circled 7 on the map, in the city centre. The restaurant in the mountains is also marked with a black circled 7, and we dine on the second floor. Reserved funiculars leave at 19:40 and 19:50, and the last funicular down leaves at 24:00. Either find your own way to the funicular station, or follow a guided walk leaving Terminus at 19:30. Additional tickets for the conference dinner can be purchased at 500 NOK.

Excursion

On Saturday July 8th there will be an excursion. Meet outside Terminus 8:20 am latest. We do not have individual tickets, so must travel as a group. In your folder is a brochure describing the trip. The excursion is the popular "Norway in a nutshell", a full day trip where we leave Bergen by train at 8:30 in the morning, traveling first up to Voss where we change to a bus which will take us down to Gudvangen by way of the steep Stalheimskleiva hairpin curves. We board a boat and proceed out Nærøyfjord, one of the narrowest fjord arms in Europe, and then follow the Aurlandsfjord into Flåm, arriving at 13:40. In Flåm there are several restaurants, and the participants are on their own for lunch. At 15:52 we take the 'alpine train' up the spectacular Flåm valley, arriving at Myrdal high in the mountains. From Myrdal a regular train takes us to Voss, where we have a pause from 17:50 to 18:40. We suggest visiting the fashionable Fleischer Hotel just next to the train station, and maybe spot a paraglider while having a refreshment on their balcony. Finally, a train takes us back to Bergen, arriving at Terminus 20:00. Tickets for the excursion are not included in the conference fee but are ordered separately (500 NOK).

Climate

The Gulf stream keeps the climate more temperate than the northernly position of the city suggests. However, the weather is unpredictable and visitors should expect the unexpected. An umbrella, a water-resistant jacket and reasonable shoes are a necessity. For a 4-day forecast follow links from the conference web pages.

Bergen tips

For general tourist sightseeing in Bergen and surroundings see the brochure in your folder. The main tourist information is next to the Fish Market, green 'i' on your map. As you can tell from the area map on the back side of your city map, it is easy to make a mountain hike, for example starting from the funicular station on top of Mount Fløyen. But please make sure you are well prepared, talk to one of the organizers. A leisurely walk with a good view of the city can be had along Fjellveien, area C-3 and D-3 on the map. The central shopping and restaurant areas in Bergen are found on the stretch from the funicular station (black circled 7 in area D-4), across the famous Fish Market and on to Ole Bulls plass (red circled 13 in area D-5). The main historical tourist attractions are between Rosenkrantztårnet (black circled 2 in area C-5) and Korskirken (black circled 9 in area D-4). Bergen is famous for its areas of old wooden buildings, that have survived the large city fires over the centuries. Such areas can be found on the slopes behind the funicular station, stretching from Domkirken (black circled 10 in area D-4) to Mariakirken (black circled 3 in area C-4). Some call this the 'Vertical Venice', referring both to the possibility of getting lost in the labyrinth of narrow pathways and the common direction of the water movement. Another pleasant walk goes out to USF (black circled 15 in area C-6) where you can have a beer while watching the sunset.

Restaurants and Pubs

Being a tourist town, Bergen abounds with restaurants in all price categories. We mention only a few. Along Bryggen and Torget, area D-4 of the map, are several restaurants serving traditional food. On the high-scale, Enhjørningen and Fiskekrogen, both close to the Fish Market, are considered to be among the best (and most expensive) fish restaurants. A folksy, slightly cheaper and somewhat dark variant suitable on a rainy day is Wesselstuen, red circled 13 in area D-5 of the map. Indian Palace serves good Indian food close to Terminus, area E-4 of the map, address Marken 32. Around the funicular station you find several small tapas restaurants. Dyvekes vinkjeller (in Hollendergaten across from the Fish Market) is a lovely wine- and beer cellar which is also the oldest open pub in Scandinavia. The owner who serves you can tell the detailed story - the place is supposed to have served acoholic beverages as far back as XIV century. For pubs we personally prefer Henrik, area D-5 of the map, across from the red circled 34, a student hangout without music so you can carry on a civilized conversation. The late-night student meeting place is still Cafe Opera, just across the street from Henrik. Even with the steep prices you will see that there are many pubs and that most are quite full.

Conference Organizers

Organizing Committee:
Pinar Heggernes, University of Bergen
Petter Kristiansen, University of Bergen
Fredrik Manne, University of Bergen
Jan Arne Telle, University of Bergen

Program Committee:
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SWAT Steering Committee:
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Rolf Karlsson, Lund University
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Esko Ukkonen, University of Helsinki

Program

Tuesday, July 4, 2000

18:00 *Welcoming Reception hosted by the city of Bergen at Schøttstuene. Find your own way or follow the guided walk leaving Terminus at 17:30.*

Wednesday, July 5, 2000

8:35 Welcome

Session 1: Data structures
Chair: F Manne

8:40 *A new trade-off for deterministic dictionaries.*
Rasmus Pagh

9:00 *Improved upper bounds for pairing heaps.*
John Iacono

9:20 *Maintaining center and median in dynamic trees.*
Stephen Alstrup, Jacob Holm, Mikkel Thorup

9:40 *Dynamic Planar Convex Hull with Optimal Query Time and* $O(\log n \cdot \log\log n)$ *Update Time.*
Gerth Brodal, Rico Jacob

Coffee Break 10:00–10:20

Session 2: Invited Talk
Chair: J.A.Telle

10:20 *Dynamic Graph Algorithms with Applications.*
Mikkel Thorup

Session 3: Dynamic Partitions
Chair: J.A.Telle

11:20 *A dynamic algorithm for maintaining graph partitions.*
L.G. Aleksandrov, H. N. Djidjev

11:40 *Data structures for maintaining set partitions.*
Michael Bender, Saurabh Sethia, Steven Skiena

Lunch Break 12:00–14:00

Session 4: Graph Algorithms
Chair: J.Gustedt

14:00 *Fixed parameter algorithms for Planar Dominating Set and related problems.*
Jochen Alber, Hans Bodlaender, Henning Fernau, Rolf Niedermeier

14:20 *Embeddings for k-connected graphs of pathwidth k.*
Arvind Gupta, Naomi Nishimura, Andrzej Proskurowski, Prabhakar Ragde

14:40 *On graph powers for leaf-labeled trees.*
Naomi Nishimura, Prabhakar Ragde, Dimitrios Thilikos

15:00 *Recognizing weakly triangulated graphs by edge separability.*
Anne Berry, Jean-Paul Bordat, Pinar Heggernes

Coffee Break 15:20–15:40 pm

Session 5: Online Algorithms
Chair: S.Skyum

15:40 *Caching for web searching.*
Bala Kalyanasundaram, John Noga, Kirk Pruhs, Gerhard Woeginger

16:00 *On-line scheduling with precedence constraints.*
Yossi Azar, Leah Epstein

16:20 *Scheduling jobs before shut-down.*
Vincenzo Liberatore.

16:40 *Resource augmentation in load balancing.*
Yossi Azar, Leah Epstein, Rob van Stee

17:00 *Fair versus unrestricted bin packing.*
Yossi Azar, Joan Boyar, Lene Favrholdt, Kim S. Larsen, Morten Nielsen

Business meeting, 17:30, Terminus Hall

Thursday, July 6, 2000

Session 6: Approximation algorithms
Chair: K.Jansen

8:40 *A d/2 approximation for maximum weight independent set in d-claw free graphs .*
Piotr Berman

9:00 *Approximation algorithms for the label-cover(MAX) and red-blue set cover problems.*
David Peleg

9:20 *Approximation algorithms for maximum linear arrangement.*
Refael Hassin, Shlomi Rubinstein

9:40 *Approximation algorithms for clustering to minimize the sum of diameters.*
Srinivas Doddi, Madhav Marathe, S.S. Ravi, David Taylor, Peter Widmayer

Coffee Break 10:00–10:20

Session 7: Invited Talk
Chair: M.Halldorsson

10:20 *Coping with NP-hardness of the Graph Bandwidth Problem .*
Uriel Feige

Session 8: Matchings
Chair: M.Halldorsson

11:20 *Robust matchings and maximum clustering .*
Refael Hassin, Shlomi Rubinstein

11:40 *The hospitals/resident problem with ties .*
Robert Irving, David Manlove, Sandy Scott

Lunch Break 12:00–14:00

Session 9: Network design
Chair: A.Proskurowski

14:00 *Incremental maintenance of the 5-edge-connectivity classes of a graph.*
Yefim Dinitz, Ronit Teplixke

14:20 *On the minimum augmentation of an l-connected graph to a k-connected graph.*
Toshimasa Ishii, Hiroshi Nagamochi

14:40 *Locating sources to meet flow demands in undirected networks.*
Kouji Arata, Satoru Iwata, Kazuhisa Makino, Satoru Fujishige

15:00 *Improved greedy algorithms for constructing sparse geometric spanners.*
Joachim Gudmundsson, Christos Levcopoulos, Giri Narasimhan

Coffee Break 15:20–15:40 pm

Session 10: Computational Geometry
Chair: R.Karlsson

15:40 *Computing the penetration depth of two convex polytopes in 3D.*
Pankaj Agarwal, Leonidas Guibas, Sariel Har-Peled, Alexander Rabinovitch, Mich Sharir

16:00 *Compact Voronoi diagrams for moving convex polygons.*
Leonidas Guibas, Jack Snoeyink, Li Zhang

16:20 *Efficient expected-case algorithms for planar point location.*
Sunil Arya, Siu-Wing Cheng, David Mount, Hariharan Ramesh

16:40 *A new competitive strategy for reaching the kernel of an unknown polygon.*
Leonidas Palios

Banquet, Fløybanen funiculars at 19:40 or 19:50

Friday, July 7, 2000

Session 11: Strings and algorithm engineering
Chair: P.Heggernes

8:40 *The Enhanced Double Digest Problem for DNA Physical Mapping.*
Ming-Yang Kao, Jared Samet, Wing-Kin Sung

9:00 *Generalization of a suffix tree for RNA structural pattern matching.*
Tetsuo Shibuya

9:20 *Efficient computation of all longest common subsequences.*
Claus Rick

9:40 *A blocked all-pairs shortest-paths algorithm.*
Gayathri Venkatarman, Sartaj Sahni, Srabani Mukhopadhyaya

Coffee Break 10:00–10:20

Session 12: Invited Talk
Chair: B.Aspvall

10:20 *Towards Complete Genome Data Mining in Computational Biology.*
Esko Ukkonen

Session 13: I/O
Chair: B.Aspvall

11:20 *On external memory MST, SSSP and multi-way planar graph separation.*
Lars Arge, Gerth Brodal, Laura Toma

11:40 *I/O-space trade-offs.*
Lars Arge, Jakob Pagter

Lunch Break 12:00–14:00

Session 14: Optimization
Chair: R.Ravi

14:00 *Parallel attribute-efficient learning of monotone Boolean functions.*
Peter Damaschke

14:20 *On the complexities of the optimal rounding problems of sequences and matrices.*
Tetsuo Asano, Tomomi Matsui, Takeshi Tokuyama

14:40 *On the complexity of the sub-permutation problem.*
Shlmo Ahal, Yuri Rabinovich

15:00 *Optimal flow aggregation.*
Subhash Suri, Tuomas Sandholm, Priyank Warkhede

Coffee Break 15:20–15:40 pm

Session 15: Distributed computing and fault-tolerance
Chair: K.Iwama

15:40 *Max- and min-neighborhood monopolies.*
Kazuhisa Makino, Masafumi Yamashita, Tiko Kameda

16:00 *Optimal adaptive fault diagnosis of hypercubes.*
Andreas Bjørklund

16:20 *Fibonacci correction networks.*
Grzegorz Stachowiak

16:40 *Least adaptive optimal search with unreliable tests.*
Ferdinando Cicalese, Daniele Mundici, Ugo Vaccaro

Saturday, July 8, 2000

8:30 am *Excursion. Meet outside Terminus at 8:20 am. Return to Terminus at 20:00.*