

DEBS 2007

Inaugural International Conference on
Distributed Event-Based Systems 2007

June 20th-22nd, 2007, in Toronto, Canada
<http://www.debs.msrg.utoronto.ca>



The Inaugural International Conference on Distributed Event-Based Systems

DEBS⁰⁷

June 20th - 22nd, 2007

Bahen Center for Information Technology

University of Toronto

Toronto, Ontario, Canada

< <http://www.debs.msrg.utoronto.ca/> >

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`michael.jaeger@acm.org`.

WELCOME MESSAGE BY THE GENERAL CHAIR

The Inaugural International Conference on Distributed Event-Based Systems (DEBS) is following on the success of the previous five editions of the DEBS workshops held from 2002 to 2006 in companion with major conferences such as ICDCS, ICSE, and SIGMOD/PODS. The conference is organized in cooperation with USENIX, the IEEE and the IEEE Computer Society, and the ACM (SIGSOFT and SIGMOD).

The objectives of the DEBS conference are to provide a forum dedicated to the dissemination of original research, the discussion of practical insights, and the reporting on relevant experience relating to event-based computing that was previously scattered across several scientific and professional communities. The conference also aims at providing a forum for academia and industry to exchange ideas, for example, through industry papers and demo papers.

Highlights of the conference include a high-quality technical program, five invited speakers (Tim Bass, SilkRoad, Inc.; Joe Sventek, University of Glasgow; Opher Etzion, IBM; Mani Chandy, California Institute of Technology; Chris Craddock, CA Labs; Gregor Hohpe, Google, Inc.), a panel, and a welcome reception with software demonstrations and poster presentations.

The conference takes place in the Bahen Center for Information Technology at the University of Toronto downtown campus.

As General Chair, I would like to take this opportunity to thank the large number of people who have contributed to the planning and organization of this conference. The various committees have worked extremely hard in creating this event, especially given the large number of submissions (i.e., research, work-in-progress, industry, and software demonstration papers) we received. I am grateful for the incooperation of the event by ACM SIGMOD, by ACM SIGSOFT, by the IEEE Computer Society, and by USENIX. I am especially grateful for the Main Event Sponsorship by CA, the Silver Sponsorship by HP, the support from USENIX and MITACS. Without this support, many aspects of the event would not have been possible.

WELCOME MESSAGE

Welcome to Toronto and welcome to the Inaugural Distributed Event-based Systems Conference. We sincerely hope that you not only enjoy the technical and social aspects of this conference, but also the various attractions Toronto has to offer.

Hans-Arno Jacobsen (General Chair)

TORONTO GUIDE

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Abstract

In this paper, we present interesting issues related to the city of Toronto. The guide is intended for researchers and presents an overview of the attractions of the city of Toronto, eating places and getting around guidelines.

Preliminary experimental results obtained by visiting some of the places listed and by obtaining recommendations from the community, suggest that the material presented herein is a promising direction for a memorable stay in the city of Toronto.

1. A Toronto Primer

Welcome to Toronto, the city whose name means “**the meeting place**” in one of the native dialects. In 1996 *Fortune* chose Toronto as the number one city outside the US for work and raising a family. Since then, the city has developed with restaurants and cafes offering all kinds of ethnic food, reflective of the multicultural background of the citizens. Statistics show that the city of Toronto represents more than 80 different ethnic groups speaking more than 100 languages [1].

Toronto is a safe and vibrant city. You can walk safely to many locations of the downtown area and the places mentioned in this guide. Transportation is very well organized and if you come by car it is more practical to park it and enjoy a walk or a ride with the subway, buses or streetcars. At the end of this paper, there is a map of downtown Toronto.

Finally, the climate of Toronto is rather mild. Toronto is on the same latitude as Cannes on the sunny Riviera and Milan. Lake Ontario serves to moderate Toronto's weather to the point that its climate is one of the mildest in Canada. Generally speaking, summer temperatures range from 15°C (60°F) to 25°C (80°F).

2. Useful Tips

TTC [2]

(DW) The Toronto Transit Commission (TTC) operates a network of subways, buses and streetcars that provide convenient transportation throughout Toronto. There are two major subway lines. The **Yonge/University/Spadina** is a U-shaped loop that runs under Yonge Street and University Avenue in the downtown area. There are subway stations where major cross streets intersect Yonge St. and University Ave. The subway stations closest to downtown hotels are in Union Station, at King and University, at King and Yonge, at Queen and University and at Queen and Yonge. The **Bloor/Danforth** runs east/west underneath Bloor Street. There are free interchanges between these two subway lines at the Yonge/Bloor station and at the St. George station and the Spadina station. Street car or bus lines run east and west on major streets.

There are two TTC streetcar lines that start in Union Station. The Harborfront 509 line runs through the Harbor Front area along Queens Quay to the CNE grounds. The Spadina 510 line runs along Queens Quay and then north along Spadina Ave to Bloor St. The Bay bus that runs north and south on Bay St is a convenient way to reach many of the places described in this guide.

The stops for surface (bus and streetcar) routes are marked with a vertical red and white TTC sign. Current TTC fares are \$2.25 cash (bus and streetcar drivers do NOT carry change) or tokens/tickets at 5 for \$9.00. There is also a day pass (\$7.50) good for unlimited rides. Tickets and passes may be purchased at subway stations or from small shops that display the TTC Tickets sign. For TTC information call 416-393-4636.

Federal and Provincial Taxes

The **Goods and Services Tax (GST)** is a 7% tax that is charged on most goods and services sold or provided in Canada. And as Toronto is part of Ontario, purchases made in Toronto are also subject to the 8% **Provincial Sales Tax (PST)**. In brief, add a 15% tax on top of the price tags you see.

Tax refund for visitors [3]

Foreign visitors to Canada can apply for a rebate on the GST that is paid on accommodation (up to 30 nights per visit), and goods purchased in Canada and exported within 60 days of the purchase. Keep your receipts and read carefully the instructions given in the above referenced website. You will need to download the corresponding form as well from <http://www.ccradrc.gc.ca/E/pbg/gf/gst176/>.

Toronto City Guides [4]

A list of the most comprehensive and useful online guides are:

- <http://www.toronto.com>
- <http://www.city.toronto.on.ca>
- <http://www.math.toronto.edu/toronto>
- <http://www.torontotourism.com>

Emergency [5]

(DW) The telephone number for fire department, police and ambulance service is 911. TeleHealth Ontario operates a 24-hour free medical advice service staffed by registered nurses at 1-866-797-0000. There are several major hospitals with Emergency Rooms on University Ave. between Dundas and College St.

Yellow Pages

The Yellow pages contain a comprehensive list of services. They can be accessed online at <http://www.yellowpages.ca/>. The hard copies (that can hopefully found in the Toronto hotels) also contain useful maps.

3. Major Attractions

3.1 Downtown

- **Royal Ontario Museum [15]:** (DW) The ROM is Ontario's largest traditional museum. [On University Avenue just south of Bloor Street. TTC Museum Station on the University subway line.]

TORONTO GUIDE

- **Art Gallery of Ontario** [16]: (DW) Home to a large collection of Canadian and World Art. [Dundas Street between University Avenue and Spadina.]
- **The Eaton's Center** [17]: One of Toronto's largest indoor shopping mall of all varieties and tastes [On Yonge Street between Dundas and Queen.]
- **University of Toronto** [18]: (DW) Canada's largest University. The St. George campus is north of College St, (mostly) west of University Avenue. [TTC Queens Park Station on the University subway.]
- **Gay Town** [19]: (DW) Toronto has one of the largest gay/lesbian communities in North America. Gay Town on Church Street between Carleton St. and Bloor St. is one focal point for this community. [TTC College St or Wellesley St stations on the Yonge subway.]

3.2 Elsewhere

- **The CN Tower** [6]: (DW) The ride from the airport downtown offers a view of the world's tallest building and free-standing structure (553+ m, 1815+ ft). On a clear day the public observation tower offers views over Toronto and as far away as Niagara Falls. The revolving restaurant at the top of the tower offers a panoramic view of the city. [Entry through the CN Tower walkway at the west end of Union Station.]
- **The Sky Dome** [7]: (DW) Toronto's largest stadium with a retractable roof. Home to the Toronto Blue Jays. [Entry from Front St. West.]
- **The Air Canada Center** [8]: Named after Canada's main airline, ACC is the main athletic facility for indoors sports, home of the NBA Toronto Raptors team and the NHL Toronto Maple Leafs team. During the summer it is used as a concert hall and there are stores that sell a variety of sports memorabilia. [entry from York Str and Lakeshore Blvd.]
- **Toronto Islands** [9]: (DW) A very large park on an island offshore. Includes restaurants, a children's amusement area and some long pleasant walking areas. Bicycles, roller blades,

canoes and paddle boats can be rented in season. [Access via the Toronto Island Ferry at Bay Str and Queens Quay.]

- **Nathan Philips Square** [10]: A large public square featuring seasonal entertainment and nice ambience. The large building in the middle of the square is Toronto's City Hall. From 10am to 2pm every Wednesday the square hosts a *Farmer's Market*, where products from all over Ontario are being sold. [Located on Queen Str West between Bay and University Ave.]
- **Harbour Front** [11]: (DW) Toronto's waterfront park. Very pleasant waterfront atmosphere. [Queens Quay, between Bay St. and Spadina Ave.]
- **Entertainment District** [12]: (DW) The main theater district in Toronto. Also home to many clubs and restaurants. [Between King St and Queen Street, west of University Avenue.]
- **St. Lawrence Market** [13]: (DW) Toronto's traditional old style market. Butchers, bakers and fruit and vegetable vendors. Several interesting foodstuffs shops. On Saturdays the market doubles in size when local farmers come in to sell their produce [Front Street at Jarvis St.
- **The Distillery** [14]: The Distillery Historic District is a Canadian heritage site and Toronto's newest arts and entertainment cultural community. Throughout the year, it hosts celebrations and special events such as the Distillery Jazz Festival [Located near the corner of Parliament and Front Str East.]
- **Ontario Science Center** [20]: (DW) A science museum featuring exhibits of interest to all ages. [770 Don Mills Road ; TTC east on Bloor Subway to Pape station then north on the Don Mills 25 bus or north on the Yonge subway to Eglinton station then east on the Eglinton East bus to Don Mills Road; (416) 696-3127.]
- **The Toronto Zoo** [21]: (DW) On of the top ten zoos in North America and the 3rd largest in terms of area (comfortable walking shoes are recommended). On Meadowvale Road north of Highway 401 in the north east corner of Toronto. [TTC Take the Bloor/Danforth/ Scarborough LRT east to Kennedy Station. Take the 86A bus from Kennedy station to the Zoo. GO TRAIN: take a GO train from Union Station to

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Rouge Hill station in Scarborough, TTC buses connect this station directly to the Zoo.; (416) 392-5900.]

- **The Casa Loma** [22]: Casa Loma is the former home of Canadian financier Sir Henry Pellatt. It is a castle with decorated suites, secret passages, an 800-foot tunnel, towers, stables, and beautiful 5-acre estate gardens. [TTC: go to Spadina station and take the Davenport 127 bus to Davenport & Spadina. Get off the bus and climb the Baldwin steps (110 steps), or take the bus one stop further to Davenport and Walmer and walk up the hill on the west side of the castle.]
- **Paramount Canada Wonderland** [23]: (DW) A major amusement park featuring rides and shows. On Highway 400 about 15 km north of Toronto. [Express GO busses run from Yorkdale and York Mills subway stations. An alternative is to take the GO train from Union Station north to Maple Station and then take the Vaughn Transit #4 bus to Canada Wonderland; (905) 832-8131]

Propositions

- **Proposition 1:** The City of Toronto provides a CityPass [24], which provides entrance to 6 famous Toronto attractions for one-low-price. Includes tickets to the Art Gallery of Ontario, Casa Loma, CN Tower, Ontario Science Centre, Royal Ontario Museum, and Toronto Zoo. The cost is \$46.00 CAD (almost half the price) and tickets can be purchased online as well as in any of the 6 attractions.
- **Proposition 2:** The Toronto theatre community has introduced T.O.TIX [25], which offers performing arts lovers the opportunity to purchase half-price tickets to a wide variety of theatre, dance, comedy, opera and music events on the day of performance.
- **Proposition 3:** This year, the 29th International Toronto Film Festival, runs from September 9 to 18. Check under <http://www.e.bell.ca/filmfest/2003/> for more information on location, hours and tickets.

4. Eating in Toronto

Toronto has over 2,000 restaurants. The Toronto Health Department has instituted a mandatory restaurant inspection program. Restaurants that have passed this inspection display a large green PASS sign.

4.1 Dining in Toronto

Alternatives for those who want to explore Toronto's cuisine a bit more:

- **Lee Garden** [34]: Chinese (Cantonese) restaurant, very popular. [331 Spadina Ave, between College and Dundas; (416) 593-9524.]
- **Nataraj** [35]: A good Indian restaurant in the Bloor Street West area. [394 Bloor St West, west of Spadina; (416) 928-2925.]
- **La Bodega** [36]: A good French restaurant. Moderate to expensive. [30 Baldwin St; east of Spadina Ave, south of College St; (416) 977-1287.]
- **Avli** [37]: An upscale Greek restaurant in Toronto's Greektown. Inexpensive to moderate. [401 Danforth Ave. TTC east on the Bloor line to Chester station; (416) 461-9577.]
- **Mezes**: Very authentic Greek restaurant. Moderate. [456 Danforth Ave; TTC east on the Bloor line to Chester station; (416) 778-5150.]
- **Le Trou Normand** [38]: A French provincial restaurant specializing in the cuisine of Normandy. [90 Yorkville Ave; TTC north on the Bay bus to Yorkville ; (416) 967-5956.]
- **Pangaea Restaurant** [39]: High end nouvelle (fusion) cuisine. Expensive. [1221 Bay Street, north of Bloor; TTC north on the Bay Street bus to Bloor St. ; (416) 920-2323.]
- **Boba** [40]: One of the finest restaurants in Toronto. Mediterranean/Asian fusion cuisine. Expensive. [90 Avenue Road, 3 blocks north of Bloor; TTC north to Museum station on the University line; (416) 961-2622.]

- **Sushi Inn** [41]: Very nice Japanese restaurant in the heart of the Yorkville area. Moderate [120 Cumberland Street, north of Bloor; TTC Bay Station and exit on Cumberland or Yorkville; (416) 923-9992.]

5. Conclusions

This document is for personal use only. Although there is not enough experimentation, it provides the basis for a pleasant and smooth stay in the city of Toronto, the place where the Inaugural International Conference on Distributed Event-based Systems is being held for the year 2007.

Even if you use this document as the basis for your getting around in Toronto, we encourage you to check the links provided. The author has done his best to assure the consistency and correctness of its contents; however, we would appreciate your input should there be missing or inaccurate information in it.

Finally, we are proposing to pursue several directions for further research. Firstly, we plan to explore variability of our evaluations with respect to factors such as ethno-cultural background (Canadian/Greek/Japanese/ etc.), age (student/junior professor/senior professor etc.), and position (academia/industry). We are also working on a framework for conducting more accurate evaluations, both with respect to outcomes and process. Therefore, we invite you to explore our city and propose your own recommendations therein.

Acknowledgements

The contents presented in this document would not have been available to the attendees of the DEBS 2007 conference without the contributions of Mike Godfrey (MG) and Dave Wortman (DW), who compiled similar guides for ICSE 2001 and RE 2001, respectively. The present guide includes some updated and additional information.

References

- [1] http://www.city.toronto.on.ca/toronto_facts/index.htm
- [2] <http://www.ttc.ca/>
- [3] <http://www.ccra-adrc.gc.ca/E/pub/tg/rc4031/rc4031-e.html>

- [4] http://www.city.toronto.on.ca/links.htm#_guides
- [5] <http://www.city.toronto.on.ca/emerg/>
- [6] <http://www.cntower.ca/>
- [7] <http://www.skydome.com/>
- [8] <http://www.theaircanadacentre.com/>
- [9] <http://www.city.toronto.on.ca/parks/island/index.htm>
- [10] <http://www.toronto.com/profile/150067/>
- [11] <http://www.harbourfrontcentre.com/>
- [12] <http://www.toronto.com/infosite/310101/>
- [13] <http://www.stlawrencemarket.com/>
- [14] <http://www.thedistillerydistrict.com/>
- [15] <http://www.rom.on.ca/>
- [16] <http://www.ago.net/>
- [17] <http://www.torontoeatoncentre.com/>
- [18] <http://www.utoronto.ca>
- [19] <http://toronto.rezrez.com/entertainment/gaytoronto/index.htm>
- [20] <http://www.ontariosciencecentre.ca/>
- [21] <http://www.torontozoo.com/>
- [22] <http://www.casaloma.org/>
- [23] <http://www.canadas-wonderland.com/>
- [24] http://www.cntower.ca/information/l3_info_rates_citypass.htm/
- [25] <http://www.totix.ca/>
- [26] <http://www.toronto.com/profile/150592/>
- [27] <http://www.cestwhat.com/>
- [28] <http://www.toronto.com/profile/146442/>
- [29] <http://www.toronto.com/profile/146609/>
- [30] <http://www.toronto.com/profile/146534/>
- [31] <http://www.toronto.com/profile/146446/>
- [32] <http://www.metropolitan.com/lwh/>
- [33] http://www.harthouse.utoronto.ca/userfiles/HTML/nts_3_1320_1.html
- [34] <http://www.toronto.com/profile/147185/>
- [35] <http://www.toronto.com/profile/221627/>
- [36] <http://www.labodegarestaurant.com/>
- [37] <http://www.toronto.com/infosite/179730/>

TORONTO GUIDE

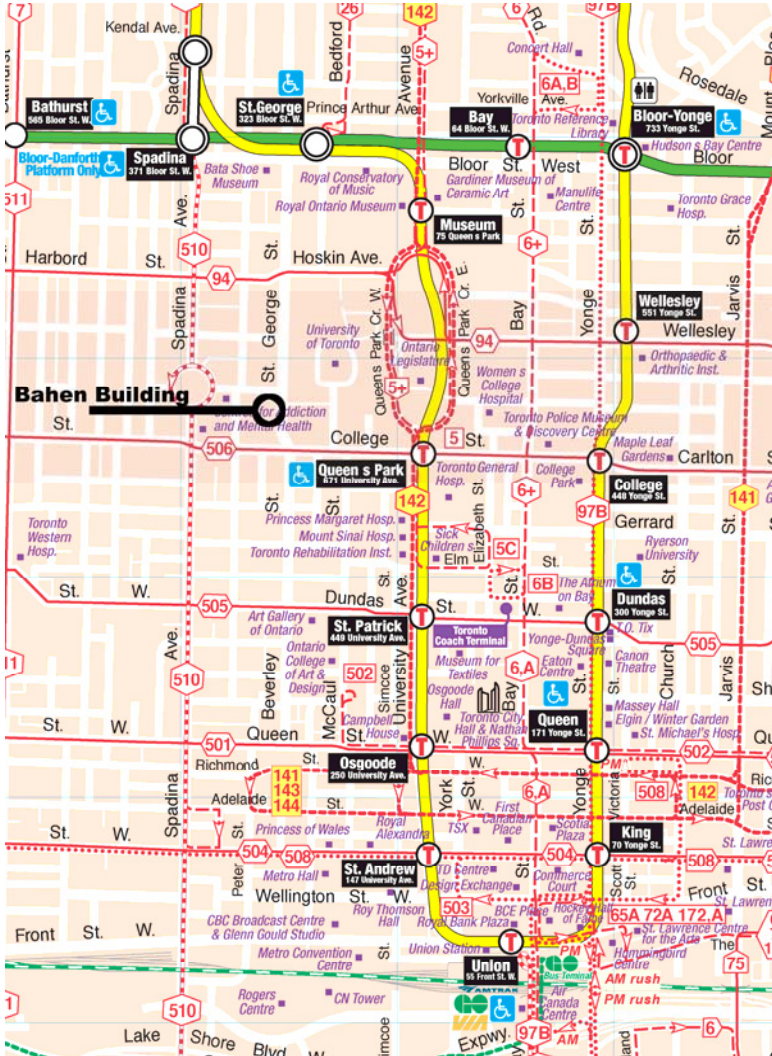
[38] <http://www.toronto.com/profile/146801/>

[39] <http://www.pangaearestaurant.com/>

[40] <http://www.toronto.com/profile/146875/>

[41] <http://www.toronto.com/profile/115741/>

Map of Downtown Toronto¹



¹ <http://www.toronto.ca/tc/pdf/downtown.pdf>

CONFERENCE VENUE

The conference will take place at the Bahen Centre for Information Technology, 40 St. George Street, Toronto. The Bahen Centre provides state of the art facility for education of information technology professionals in electrical and computer engineering, computer science and IT research.



The prime users of this building are the faculties of Applied Science and Engineering and Arts and Science of University of Toronto.

The Bahen Building is designated as "BA". It is located on the lower left hand corner of the map on page 17. It is at the intersection of College and St George². If you are arriving by public transportation (TTC), it is a 10 minute walk south from St. George subway station or a 7 minute walk west from Queens Park subway station.

Address

Bahen Center for Information Technology
University of Toronto
40 St. George Street
Toronto

Parking

Paid parking is available in the basement of the Bahen building and on the University of Toronto campus. Entry to campus parking can be found directly across the street from the Bahen building. Meter parking is also available in side streets, but may be hard to find.

² <http://www.osm.utoronto.ca/map/>

CONFERENCE VENUE

TTC (public transport)

- St-George Subway/TTC station is a 10 minute walk
- Queens Park Subway/TTC station is a 7 minute walk

Transportation from airport to hotel

Taxi and limo from airport to hotel

Catch a cab or limo from the airport on the ground level, just outside of the baggage pick up

- Taxi is about \$CAD 40 to the hotel.
- Limo is about \$CAD 55 to the hotel.

It takes about 20 minutes travel time.

Shuttles and Public transportation³

Other transportation options, such as the Airport Express bus are available from:

<http://www.toronto.com/travel/article/000-375-935>.

See the TTC website at http://www.toronto.ca/ttc/service_to_airport.htm for details and where to catch the bus at the airport.

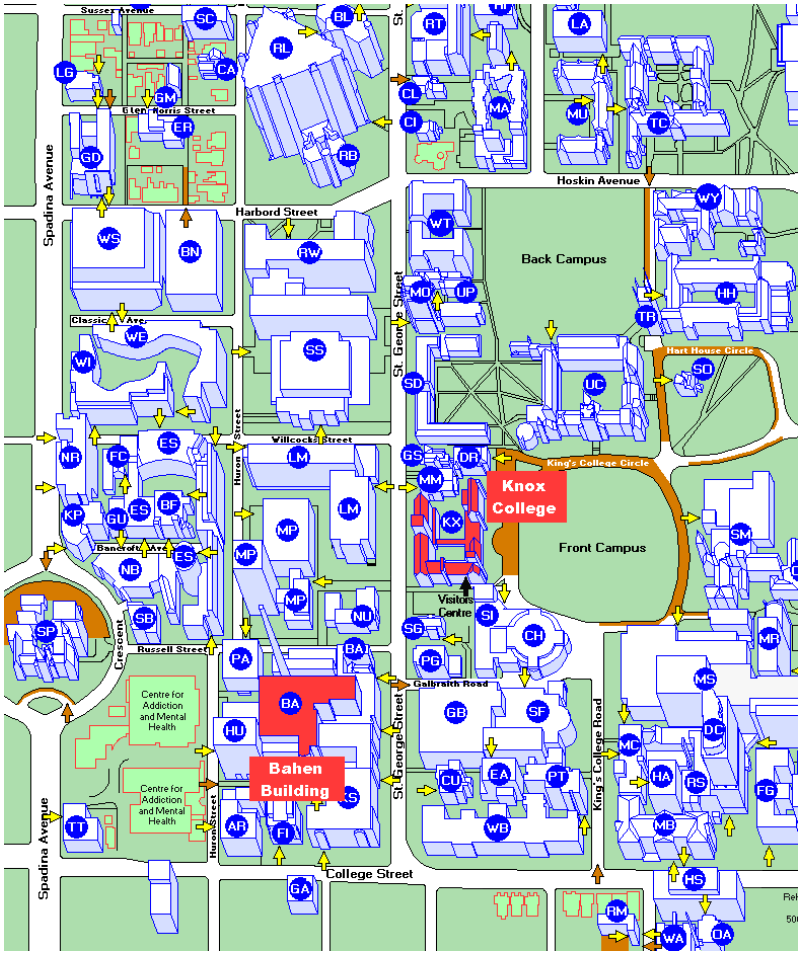
Costs are about \$CAD 2.25. You may want to go to Union Station in downtown Toronto. From there, either walk (10-15 min) to the hotel or take a taxi (\$CAD 5).



³ Map from http://www.toronto.ca/ttc/pdf/subway_rt.pdf

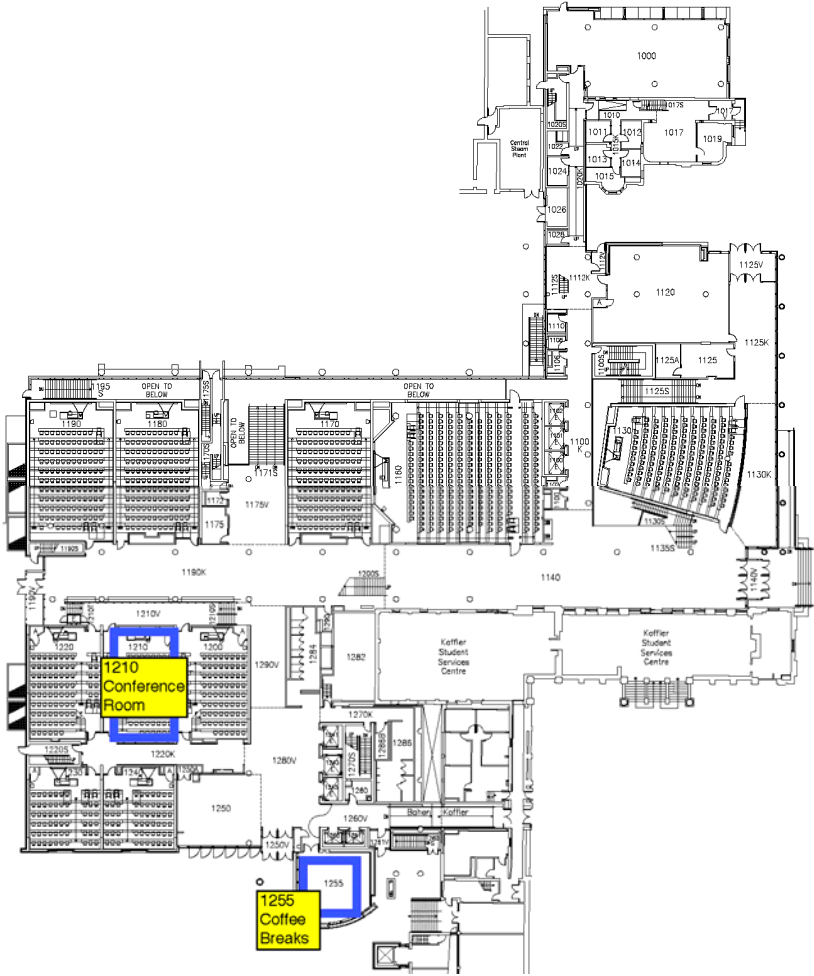
VENUE LAYOUT

Campus Map

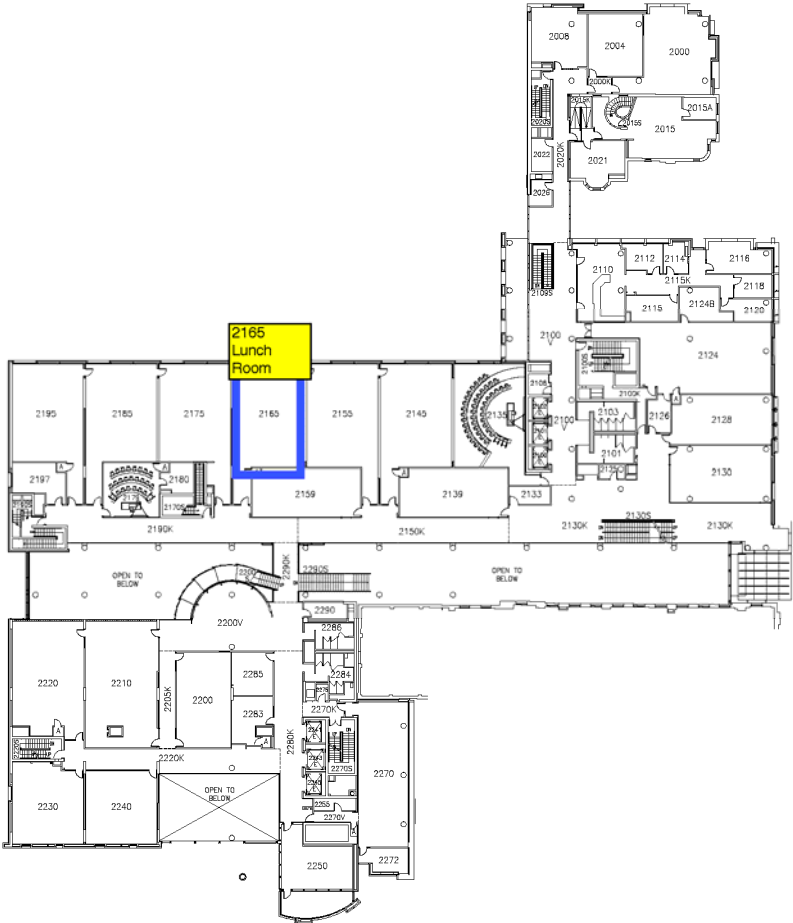


VENUE LAYOUT

Bahen Building, 1st Floor

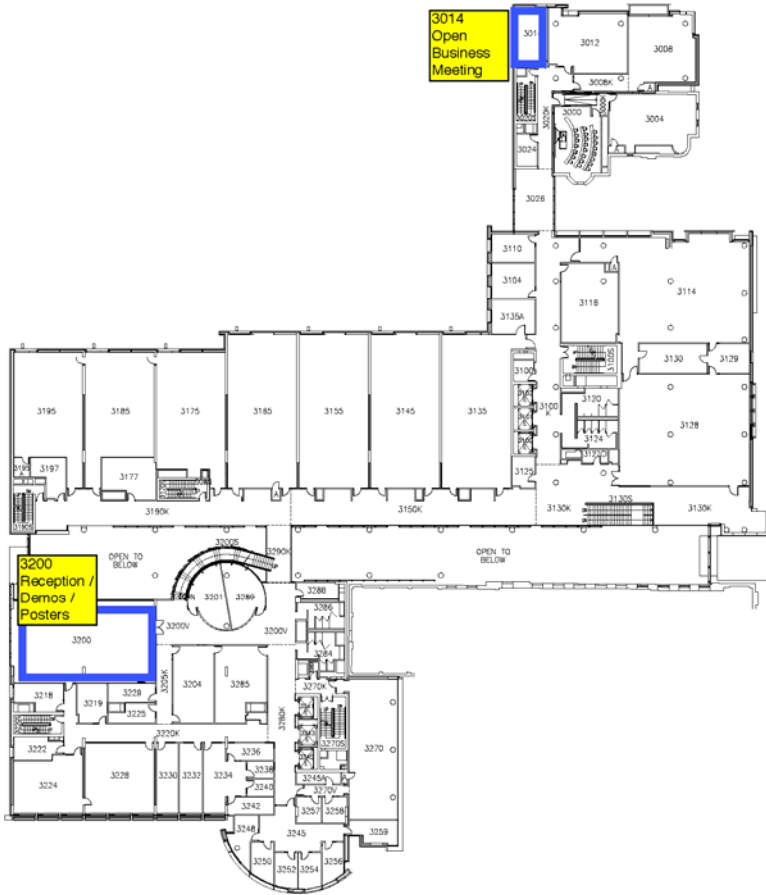


Bahen Building, 2nd Floor



VENUE LAYOUT

Bahen Building, 3rd Floor



PROGRAM AT A GLANCE

PROGRAM AT A GLANCE

If not mentioned otherwise, the conference takes place in room BA 1210 in the Bahen Building.

Tuesday, June 19th, 2007	 Location: BA 7180
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Pre-DEBS Conference Workshop

<i>08.30 – 9.00</i>	<i>Breakfast</i>
09.00 – 12.00	Workshop
<i>12.00 – 13.30</i>	<i>Lunch Break</i>
13.30 – 15.00	Workshop
<i>15.00 – 15.30</i>	<i>Coffee Break</i>
15.30 – 17.00	Workshop

Wednesday, June 20th, 2007	 Location: BA 1210
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08.30 – 9.00	Welcome
09.00 – 10.00	Keynote (Tim Bass, SilkRoad, Inc.)
<i>10.00 – 10.30</i>	<i>Coffee Break</i>
10.30 – 12.00	Session 1 (Peer-to-Peer and Mobility)
<i>12.00 – 13.30</i>	<i>Lunch Break</i>
13.30 – 15.00	Session 2 (Concepts and Models)
<i>15.00 – 15.30</i>	<i>Coffee Break</i>
15.30 – 17.00	Panel Discussion (chaired by Joe Sventek)
17.30 – 19.00	Social Event (Reception) Demo Session Short Paper Poster Session

PROGRAM AT A GLANCE

Thursday, June 21st, 2007		 Location: BA 1210
09.00 – 10.00	Keynote (Joe Sventek, University of Glasgow)	
<i>10.00 – 10.30</i>	<i>Coffee Break</i>	
10.30 – 12.00	Session 3 (Security and Software Engineering)	
<i>12.00 – 13.30</i>	<i>Lunch Break</i>	
13.30 – 14.30	Keynote (Opher Etzion, IBM Research Haifa)	
<i>14.30 – 15.00</i>	<i>Coffee Break</i>	
15.00 – 16.30	Short Paper Session	
16.30 – 17.30	Keynote (Mani Chandy, California Institute of Technology)	
<i>17.45 – 18.45</i>	<i>Open Business Meeting</i>	
19.00	Social Event (Banquet) Dinner talk by Chris Craddock (Principal Technology Strategist at CA Labs)	

Friday, June 22nd, 2007		 Location: BA 1210
09.00 – 10.00	Keynote (Gregor Hohpe, Google, Inc.)	
<i>10.00 – 10.30</i>	<i>Coffee Break</i>	
10.30 – 12.00	Session 4 (Business Applications)	
<i>12.00 – 13.30</i>	<i>Lunch Break</i>	
13.30 – 15.30	Session 5 (Routing and Matching)	
15.30 – 15.45	Conference Closing	

CONFERENCE PROGRAM

Wednesday, 08.30 – 09.00	 Location: BA 1210
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Conference Opening

Welcome Address from the Conference Chair: Hans-Arno Jacobsen, University of Toronto

Wednesday, 09.00 – 10.00	 Location: BA 1210
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Mythbusters: Event Stream Processing Versus Complex Event Processing

Session Chair: Opher Etzion (IBM Research Haifa)

Keynote by Tim Bass (SilkRoad, Inc.)

Wednesday, 10.00 – 10.30	 Location: BA 1255
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Coffee Break

Provided by the conference

Wednesday, 10.30 – 12.00	 Location: BA 1210
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Session 1: Peer-to-Peer and Mobility

Session Chair: Opher Etzion (IBM Research Haifa)

TERA: Topic-based Event Routing for peer-to-peer Architectures

Roberto Baldoni (Sapienza, Universita di Roma, Italy), Roberto Beraldi (Sapienza, Universita di Roma, Italy), Vivien Quéma (INRIA, France), Leonardo Querzoni (Sapienza, Universita di Roma, Italy), and Sara Tucci Piergiovanni (Sapienza, Universita di Roma, Italy)

SpiderCast: A Scalable Interest-Aware Overlay for Topic-Based Pub/Sub Communication

Gregory Chockler (IBM Haifa, Israel), Roie Melamed (IBM Haifa, Israel), Yoav Tock (IBM Haifa, Israel), and Roman Vitenberg (University of Oslo, Norway)

CONFERENCE PROGRAM

An Efficient Demand-Driven and Density-Controlled Publish/Subscribe Protocol for Mobile Environments

Doug Lundquist and Aris Ouksel (University of Illinois, USA)

Wednesday, 12.00 – 13.30

Lunch Break

Provided by the conference

Wednesday, 13.30 – 15.00

| Location: BA 1210

Session 2: Concepts and Models

Session Chair: Mani Chandy (California Institute of Technology)

Modeling the Communication Costs of Content-based Routing: The Case of Subscription Forwarding

Stefano Castelli (University of Trento, Italy), Paolo Costa (Vrije Universiteit Amsterdam, Netherlands), and Gian Pietro Picco (University of Trento, Italy)

Seamless Formal Verification of Complex Event Processing Applications

AnnMarie Ericsson (University of Skövde, Sweden), Paul Petersson (Mälardalen University, Sweden), Mikael Berndtsson (University of Skövde, Sweden), and Marco Seiriö (RuleCore, Sweden)

Concepts and Models for Typing Events for Event-Based Systems

Szabolcs Rozsnyai (Secure Business, Austria), Josef Schiefer (TU Wien, Austria), and Alexander Schatten (TU Wien, Austria)

Wednesday, 15.00 – 15.30

| Location: BA 1255

Coffee Break

Provided by the conference

Wednesday, 15.30 – 17.00

| Location: BA 1210

Panel Discussion

Session Chair: Joe Sventek (University of Glasgow)

**“Grand Challenges in Distributed Event-Based Systems” or
“Can DEBS take over the world?”**

Wednesday, 17.30 – 19.00

| Location: BA 3200

Demo Session

REX, the Rule and Event eXplorer

AnnMarie Ericsson and Mikael Berndtsson (University of Skövde, Sweden)

A System for Semantic Data Fusion in Sensor Networks

Alex Wun, Milenko Petrovic, and Hans-Arno Jacobsen (University of Toronto, Canada)

Historic Data Access in Publish/Subscribe

Guoli Li, Alex Cheung, Shunag Hou, Songlin Hu, Vinod Muthusamy, Reza Sherafat, Alex Wun, Hans-Arno Jacobsen, and Serge Manovski (University of Toronto, Canada)

Short Paper Poster Session

Temporal Order Optimizations of Incremental Joins for Composite Event Detection

Francois Bry (University of Munich, Germany) and Michael Eckert (University of Toronto, Canada)

Adapting Publish-Subscribe to Routing Demands

Matteo Migliavacca and Gianpaolo Cugola (Politecnico di Milano, Italy)

Chained Forests for Fast Subsumption Matching

Sasu Tarkoma (Helsinki University of Technology, Finland)

Reception

Social Event in Room BA 3200 (The Great Hall of Computing).

Thursday, 09.00 – 10.00 | **Location: BA 1210**

The Little and Large of Publish/Subscribe—Ever the Twain Shall Meet?

Session Chair: Jean Bacon (University of Cambridge)

Keynote by Joe Sventek (University of Glasgow)

Thursday, 10.00 – 10.30 | **Location: BA 1255**

Coffee Break

Provided by the conference

Thursday, 10.30 – 12.00 | **Location: BA 1210**

Session 3: Security and Software Engineering

Session Chair: Annika Hinze (University of Waikato, New Zealand)

Encryption-Enforced Access Control in Dynamic Multi-Domain Publish/Subscribe Networks

Lauri Pesonen, David Eyers, Jean Bacon, and Ken Moody (University of Cambridge, UK)

A Taxonomy for Denial of Service Attacks in Content-based Publish/Subscribe Systems

Alex Wun, Alex Cheung, and Hans-Arno Jacobsen (University of Toronto, Canada)

On Adding Replies to Publish-Subscribe

Gianpaolo Cugola, Matteo Migliavacca, and Alessandro Monguzzi (Politecnico di Milano, Italy)

Thursday, 12.00 – 13.30

Lunch Break

Provided by the conference

Thursday, 13.30 – 14.30

| Location: BA 1210

Semantic Approach to Event Processing

Session Chair: Mani Chandy (California Institute of Technology)

Keynote by Opher Etzion (IBM Research Haifa)

Thursday, 14.30 – 15.00

| Location: BA 1255

Coffee Break

Provided by the conference

Thursday, 15.00 – 16.30

| Location: BA 1210

Short Paper Session

Session Chair: Rainer von Ammon (CITT GmbH)

A QoS Policy Configuration Modeling Language for Publish/Subscribe Middleware Platforms

Joe Hoffert, Douglas Schmidt, and Aniruddha Gokhale (Vanderbilt University, USA)

High Frequency Distributed Data Stream Event Correlation to Improve Neonatal Clinical Management

Carolyn McGregor and Michael Stacey (University of Western Sydney, Australia)

Towards a Common API for Publish/Subscribe

Peter Pietzuch (Imperial College London, UK), David Eysers (University of Cambridge, UK), Samuel Kounev (University of Cambridge, UK), and Brian Shand (Clinical and Biomedical Computing Unit, UK)

A Practical Approach for Enabling Online Analysis of Event Streams

Sebastian Salvucci (Intel Corp., Argentina), Mariano Cilia (Intel Corp., Argentina), and Alejandro Buchmann (TU Darmstadt, Germany)

CONFERENCE PROGRAM

Identification of Suspicious, Unknown Event Patterns in an Event Cloud

Alexander Widder (Centrum für Informations-Technologie Transfer GmbH, Germany), Rainer von Ammon (Centrum für Informations-Technologie Transfer GmbH, Germany), Philippe Schaeffer (TÜV Rheinland Secure iT GmbH, Germany), and Christian Wolff (University of Regensburg, Germany)

Modelling Performance Optimizations for Content-based Publish/Subscribe

Alex Wun and Hans-Arno Jacobsen (University of Toronto, Canada)

Thursday, 16.30 – 17.30

| Location: BA 1210

Towards A Theory of Events

Session Chair: Alejandro Buchmann (Darmstadt University of Technology)

Keynote by Mani Chandy (California Institute of Technology)

Thursday, 17.45 – 18.45

| Location: BA 3014

Open Business Meeting

Thursday, 19.00 | Location: Dining Hall, Knox College

Conference Banquet

The conference banquet will take place at Knox College in The Knox Dining Hall (please refer to the map on page 17). The social event will include a dinner talk by Chris Craddock, Principal Technology Strategist at CA Labs, entitled “Event Processing for System Management”.

Friday, 09.00 – 10.00

| Location: BA 1210

Architect's Dream or Developer's Nightmare?

Session Chair: Hans-Arno Jacobsen (University of Toronto)

Keynote by Gregor Hohpe (Google, Inc.)

Friday, 10.00 – 10.30

| Location: BA 1255

Coffee Break

Provided by the conference

Friday, 10.30 – 12.00

| Location: BA 1210

Session 4: Business Applications

Session Chair: Jean Bacon (University of Cambridge)

Persisting and Querying Biometric Event Streams with Hybrid Relational-XML DBMS

Daby Sow (IBM T.J. Watson, USA), Lipyeow Lim (IBM T.J. Watson, USA), Min Wang (IBM T.J. Watson, USA), and Kyu Hyun Kim (IBM Ubiquitous Computing Laboratory, USA)

Event-Driven Rules For Sensing and Responding To Business Situations

Josef Schiefer (TU Wien, Austria), Szabolcs Rozsnyai (Secure Business Austria, Austria), Gerd Saurer (Senactive IT Dienstleistungen GmbH, Austria), and Christian Rauscher (Secure Business Austria, Austria)

Software Architecture Using Fine-grained Event-driven Reactive Components

Paul Tarvydas and Norm Sanford (Visual Frameworks Inc., Canada)

Friday, 12.00 – 13.30

Lunch Break

Provided by the conference

Friday, 13.30 – 15.30

| Location: BA 1210

Session 5: Routing and Matching

Session Chair: Daby Sow (IBM T.J. Watson)

Efficient Distributed Subtyping Tests

Sebastien Baehni (EPFL, Switzerland), Joao Barreto (INESC-ID/IST, Portugal), Patrick Eugster (Purdue University, USA), and Rachid Guerraoui (EPFL, Switzerland)

The Arbitrary Boolean Publish/Subscribe Model: Making the Case

Sven Bittner and Annika Hinze (University of Waikato, New Zealand)

Prefix Forwarding for Publish/Subscribe

Zbigniew Jerzak and Christof Fetzer (Dresden University of Technology, Germany)

Scalable Event Matching for Overlapping Subscriptions in Pub/Sub Systems

Zhen Liu, Srinivasan Parthasarthy, Anand Ranganathan, and Hao Yang (IBM T.J. Watson, USA)

Friday, 15.30 – 15.45

| Location: BA 1210

Conference Closing

Closing words by the organizers of DEBS 2007

SPECIAL EVENTS

Keynote Speech: “Mythbusters: Event Stream Processing Versus Complex Event Processing”

Tim Bass, SilkRoad, Inc.

There has been significant event processing controversy in the use of the terms event stream processing (ESP) and complex event processing (CEP). CEP was originally envisioned as a technology to extract new information from message-based systems; while ESP was designed to extract new information from database-oriented systems. One school of thought is that ESP is analogous to signal processing and CEP is more aligned with higher level situational inferencing. Another school of thought is that CEP and ESP are one in the same!

This talk explores the relationship between CEP and ESP in the context of event processing, and in particular to an event processing reference architecture derived from earlier distributed blackboard computing models. After introducing the model, we explore where ESP and CEP "fit" by applying ESP and CEP concepts to practical use cases for event processing, drawing from signal processing, decision theory, control theory, and stochastic processing. The basis of the talk is derived from established thinking in the domain of multi-sensor data fusion, applying traditional concepts to today's commercial view of event processing. The talk will be controversial and provocative, stimulating discussion and thought on areas for further research and development.

Tim Bass, CISSP, is a Principal Global Architect and Director for TIBCO Software Inc. He is currently focusing on emerging commercial applications of complex event processing for TIBCO. He has provided independent senior subject matter expertise to both industry and government for over 20 years, including Chase Manhattan Bank, the Swiss Bank Corporation (SBC), the "Society for Worldwide Interbank Financial Telecommunication" (SWIFT), the United States Air Force (USAF), the Office of the Secretary of Defense (OSD/NII), and other global multi-national organizations. Mr. Bass graduated B.S.E., Tulane University, School of Engineering, 1987 Magna Cum Laude, Electrical Engineering. His work on Internet security and cyberattack countermeasures has been featured in Popular Sci-

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ence Magazine and Federal Computer Week. He is internationally recognized as a thought leader in next-generation intrusion and distributed multi-sensor data fusion architecture, in part, based on his paper, Intrusion Detection Systems & Multisensor Data Fusion, Communications of the ACM, pp. 99-105, Vol. 43, No. 4, April 2000.

Keynote Speech: “Towards A Theory of Events”

K. Mani Chandy, California Institute of Technology

Many factors are considered in the design of event-based systems. These parameters include the rates at which messages are generated by sensors; the network topology by which information about events is communicated; whether information is propagated continuously by analog signals, periodic synchronous messages, asynchronous messages or mobile agents; the computation carried out at different points in the network; and accuracy of sensors, actuators and computational nodes.

This talk proposes a mathematical model that aids systematic design by providing a theoretical framework for evaluating design alternatives. A focus of the model is the value of information: What is the difference in value to the overall system if a message is sent or not sent to an agent? What is the difference in value if a message is sent in a timely manner or late; if it is accurate or noisy? What should an agent do in the absence of information in a time interval? The ideas draw upon theory from control systems, signal processing, Bayesian decision theory and stochastic processes. The talk proposes a model and discusses its strengths and weaknesses. The talk develops a theory, based on the model, and uses the theory to evaluate different implementations of event-based systems.

Mani Chandy got his PhD from MIT in Electrical Engineering and Operations Research in 1969. He taught at the University of Texas at Austin from 1970 to 1987 and from then at the California Institute of Technology where he currently holds the Simon Ramo Chair of Computer Science. Awards received include the IEEE Koji Kobayashi Award and the CMG A.A. Michelson Award. He is a member of the National Academy of Engineering.

Keynote Speech:
“Architect's Dream or Developer's Nightmare?”

Gregor Hohpe, Google, Inc.

Event-based systems offer many benefits. They enable loose coupled, composable solutions that can be highly scalable. They also resemble the real world—major parts of our daily lives are governed by events: the phone rings, a customer places an order, the fuel warning lamp in the car comes on. Unfortunately, the architectural benefits are often offset by the complexity of developing event-based solutions. This talk examines why building event-based solutions can be challenging and how we can make it more approachable.

Gregor Hohpe is a software architect with Google, Inc. Gregor is a widely recognized thought leader on asynchronous messaging architectures and service-oriented architectures. He co-authored the seminal book "Enterprise Integration Patterns" and speaks regularly at technical conferences around the world. Find out more about his work at www.eaipatterns.com.

Keynote Speech:
“Semantic Approach to Event Processing”

Opher Etzion, IBM Research Haifa

Various approaches have been taken towards modelling and definition of event processing systems, the dominant ones being: using rules, using SQL extensions, and using scripts. Yet, there are some semantic structures that are expressed by all of them, providing the opportunity to raise the level of abstraction and create semantic model of event processing. This talk will describe the major different types of event processing from the point of view of the role it plays in computing, describe some common design patterns, and then describe the idea of the semantic approach to event processing, the semantic abstractions that are required in order to achieve it, and its possible automatic mappings to various implementations. The concepts will be demonstrated by a comprehensive example.

Opher Etzion is IBM Senior Technical Staff Member, and Lead Architect for event processing technologies in IBM Software

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Group. Previously he has been a Senior Manager in IBM Research division, managed a department that focused around foundation and applications to complex event processing. In parallel he is also an adjunct faculty member at the Technion -- Israel Institute of Technology. He has authored or co-authored around 70 papers in refereed journals and conferences, on topics related to: active databases, temporal databases, rule-base systems, complex event processing and autonomic computing, and co-authored the book "Temporal Database -- Research and Practice", Springer-Verlag, 1998. Prior to joining IBM in 1997, he has been a faculty member and Founding Head of the Information Systems Engineering department at the Technion, and held professional and managerial positions in industry and in the Israel Air-Force. He has been program and general chair of various conferences and workshops (CoopIS 2000, NGITS 1993, NGITS 2006) and chaired the first event processing symposium, and co-chaired the recent Event Processing Dagstuhl Seminar (May 2007). He has given keynote addresses in various conferences, and has been guest editor of special issues of Journal of Intelligent Information Systems and Journal of Cooperative Information Systems.

Keynote Speech: “The Little and Large of Publish/Subscribe—Ever the Twain Shall Meet?”

Joe Sventek, University of Glasgow

Publish/subscribe is a popular event dissemination mechanism, providing anonymous, store-and-forward message distribution. Such systems have been deployed in quite small application environments, such as body area networks for patient health monitoring; they have also been deployed in extremely large distributed application environments, such as stock price distribution systems.

The AMUSE project in the UK is a collaboration between computing researchers at the University of Glasgow and Imperial College London. This project is focused on the concept of self-managed cells (SMC) as the basic unit of autonomous computing, and the federation of such cells at different levels of scale. Publish/subscribe implementations form the basis of SMCs at all

levels of scale, and the federation of these P/S implementations forms the basis of SMC-SMC interactions.

This talk will present the P/S systems at the heart of small and large scale SMCs, and explore their federation. The efficacy of such federations will be discussed, and lessons learned recounted.

Joe Sventek is the Professor of Communication Systems in the Department of Computing Science at the University of Glasgow. He received a B.A. in Mathematics cum laude from the University of Rochester and a Ph.D. in Nuclear Chemistry from the University of California. Prior to his current position, he led the distributed systems group at Lawrence Berkeley Laboratory, lectured in the Computer Science department of the University of California, led the ANSAware implementation team in Cambridge, served as the lead architect for HP's Distributed Computing Program, was HP's Laboratory Scientist for Distributed and Object-oriented computing, and, most recently, was director of Agilent Laboratories Scotland and, simultaneously, a research fellow in Agilent Laboratories. He was recently elected a fellow of the Royal Society of Edinburgh and the Institution of Engineering and Technology. His current research interests include programmable networking techniques for automated network management, architectures for complex distributed systems, ubiquitous computing systems for health monitoring and co-design techniques applied to the engineering of environmental sensor systems.

Dinner Speech:
“Event Processing for System Management”

Chris Craddock, CA

Event-based approaches have been used in commercial systems management for many years, primarily to accomplish point to point integration between products that were not originally designed to work together. They have been more cost-effective than wholesale rewrites of incompatible products, but as they have proliferated they have begun to succumb to brittleness and $O(n^2)$ complexity issues. The talk will be about the challenges we are facing in moving to a next generation of event-based systems for management automation.

Chris Craddock is a CA Distinguished Engineer and Principal Technology Strategist at CA.

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