A short history of Real Time Conferences

P. Le Dû

patrickledu@me.com
Goals of this presentation

- Give you a little overview of the Real Time Conference over the last 50 years
- I was around for the last 27 years (1993-2000)
- Its evolution to become what it is today
- Apologize if my memory forget something
- I was using some personal documents and photos
- Thanks to Dick Kouzes who gave a lot of information

- Attendance
- Abstracts collected

<table>
<thead>
<tr>
<th>Year</th>
<th>Attendance</th>
<th>Abstracts collected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vancouver_93</td>
<td>230</td>
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<tr>
<td>East-Lansing_95</td>
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<td>Santa-fe_99</td>
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<td>170</td>
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<td>Valencia_2001</td>
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<td>130</td>
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<tr>
<td>Stockholm_2005</td>
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<td>120</td>
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<td>FNAL2007</td>
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<td>Beijing_2009</td>
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<td>Lisbon_2010</td>
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<td>Berkeley_2012</td>
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<td>Nara_2014</td>
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<td>190</td>
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<tr>
<td>Padova_2016</td>
<td>260</td>
<td>200</td>
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<tr>
<td>Williamsburg_2018</td>
<td>270</td>
<td>210</td>
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</tbody>
</table>

19 Oct 2020

AMU presentation
The prehistoric times 1969-1983

- 1969: Skytop Conference
- 1979: RT-1 Santa Fe (Dennis Perry, conference chair)
- 1979: ad hoc Real-Time Committee formed
- 1981: RT-2 Oak Ridge (Dave Hensley, conference chair)
- 1983: RT-3 Berkeley (Creve Maples, conference chair)

Objective: begin activities such as creating a tape format for data storage (released as the CANPS format in 1987), and trying to obtain funding to set up a central repository for nuclear and particle physics software in the US.

1984: IEEE CANPS Committee formed
Ed Barsotti (FNAL) 1st CANPS chair

Parallel projection
The early period 1984-92

<table>
<thead>
<tr>
<th>Year</th>
<th>RT</th>
<th>Location</th>
<th>Chair</th>
<th>CANPS Chair</th>
<th>Award</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985</td>
<td>RT-4</td>
<td>Chicago (US)</td>
<td>Lester Welch</td>
<td>Ed. Barsotti</td>
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<tr>
<td>1987</td>
<td>RT-5</td>
<td>San Francisco (US)</td>
<td>Denis O'Brien</td>
<td>Lester Welch</td>
<td>Edwin Norbeck</td>
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<td>1989</td>
<td>RT-6</td>
<td>Williamsburg (US)</td>
<td>Roy Whitney</td>
<td>Dick Kouzes</td>
<td>René Brun</td>
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<td>1991</td>
<td>RT-7</td>
<td>Julish (GE)</td>
<td>Klaus Mueller</td>
<td>Dick Kouzes</td>
<td>Harry Bisby</td>
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</tbody>
</table>

Dick Kouzes
PNL

Ed Barsotti
FNAL

Peter Clout
Vista Control System

1st European RT in Julich
Klauss Mueller Chair
## The new age (1993-2001)

<table>
<thead>
<tr>
<th>Year</th>
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<th>CANPS Chair</th>
<th>Award</th>
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<tbody>
<tr>
<td>1993</td>
<td>RT-8</td>
<td>Vancouver (Can)</td>
<td>Renée Poutissou</td>
<td>Ruth Pordes</td>
<td>Lou Costrel</td>
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<tr>
<td>1995</td>
<td>RT-9</td>
<td>East Lansing (US)</td>
<td>Ron Fox</td>
<td>Renée Poutissou</td>
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<tr>
<td>1997</td>
<td>RT-10</td>
<td>Beaune (F)</td>
<td>Patrick Le Dû</td>
<td>Tom Koslowski</td>
<td>Phil Ponting</td>
</tr>
<tr>
<td>1999</td>
<td>RT-11</td>
<td>Santa Fe (US)</td>
<td>Tom Kozlowski</td>
<td>Christian Boulin</td>
<td>Robert Downing</td>
</tr>
<tr>
<td>2001</td>
<td>RT-13</td>
<td>Valencia (SP)</td>
<td>Antonio Ferrer</td>
<td>Christian Boulin</td>
<td>________</td>
</tr>
</tbody>
</table>

- Majority of HEP: LEP, FNAL, Tevatron, SSC, DESY, HERA, SLAC (PEP)
- LHC, SSC, SLAC, Babar, Tevatron R2, Tristan, BNL, RHIC, Fusion,
- Read Out electronics: DSP... CAMAC, Fastbus modules
- Filter and processor farm concept
- (Emulator 370E, Transputers, RISC, ACP, PCI Express, Rapid IO software (OS9 ...)
- Microprocessor and VME standard
- Test beam systems
- Event builder (and fast links GB ethernet, ATM ...)

---

Louis Costrell 1915-2009
Evolution of DAQ technologies and architectures

1970–80
*CERN PS/SPS*
**Minicomputers**
Readout custom design
First standard: CAMAC
kByte/s

1980–90
*LEP*
**Microprocessors**
HEP standards (Fastbus)
Embedded CPU,
Industry standards (VME)
MByte/s

2007 ...
*LHC (CMS)*
**Networks/Grids**
IT commodities, PC, Clusters
Internet, Web, etc.
GByte/s

Event building
On-line processing
Off-line data store

19 Oct 2020

From S. Cittolin
1997 Beaune France

The Hotel Dieu

Chateau de Meursault dinner Wine tasting
## The new age (2003-2010)

<table>
<thead>
<tr>
<th>Year</th>
<th>RT</th>
<th>Location</th>
<th>Chair</th>
<th>CANPS Chair</th>
<th>Award</th>
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<td>2003</td>
<td>RT-13</td>
<td>Montreal (Can)</td>
<td>J.P. Martin</td>
<td>Christian Boulin</td>
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<td>2005</td>
<td>RT-14</td>
<td>Stockholm (SE)</td>
<td>Richard Jacobson</td>
<td>J.P. Martin</td>
<td>Ed Barsotti</td>
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<td>2007</td>
<td>RT-15</td>
<td>FNAL (US)</td>
<td>Margaret Votava</td>
<td>J.P. Martin</td>
<td>Peter Clout</td>
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<td>2009</td>
<td>RT-16</td>
<td>Beijing IHEP (CN)</td>
<td>Yifang Wang</td>
<td>J.P. Martin</td>
<td>S. Cittolin</td>
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<td>2010</td>
<td>RT-17</td>
<td>Lisbon (P)</td>
<td>Carlos Varandas</td>
<td>Stefan Ritt</td>
<td>A. Luchetta</td>
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</table>

- HEP (LHC) Fusion
- Medical Imaging,
- MTCA standard
- FPGA
## Lastest developments on Real Time techniques in Plasma, Nuclear, Particle Physics, in Astrophysics and applications in Biology, Medicine and Industry

### Program Committee
Chair: Ph. Le Do (CEA, FR)
- E. Barone (INFN, IT)
- C. Boulon (EMBL, DE)
- G. Canel (CIA, FR)
- B. Chid (HIV System, USA)
- J.P. Dufey (CEA)
- M. Gavel (CERN)
- H. Akutsu (MPL, USA)
- W. Kozek (LBNL, USA)
- A. Lankit (RGL, USA)
- J. Lecuyer (CEA, FR)
- W. Mises (UNL, USA)
- R. Noms (NIST, USA)
- S. Siewiers (Alcatel)

### Local Organizing Committee
Chair: J.P. Martin (Univ. de Montreal)
- P. Amaudruz (Télécom)
- R. Lecomte (Univ. de Sherbrooke)
- C. Latyo (Univ. de Montreal)
- D. Mathur (Univ. of Victoria)
- R. Podmore (Télécom)
- K. Rogers (Univ. McGill, Montreal)

### Sessions
- Real Time systems architecture
- Signal processing
- Algorithms implementation
- Trigger and data acquisition
- Event building and fast networks
- Controls, monitoring and GUI's
- Software framework and tools
- On line databases
- Networked computing (i.e. GRID's.)
- Industrial standards and trends
- Medical imaging processing

### Short Courses and Tutorials
E-mail: rt2003@hep.soclay.cec.fr
http://www-dapnia.ciea.fr/rt2003

### Fields and Percentages

<table>
<thead>
<tr>
<th>Fields</th>
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<tr>
<td>HEP</td>
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<td>Plasma</td>
<td>11</td>
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<tr>
<td>Nuclear Physics</td>
<td>9</td>
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<tr>
<td>Medical (new)</td>
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<tr>
<td>Astrophysics</td>
<td>7</td>
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<tr>
<td>Others</td>
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</table>

2003 Montreal

Jean -Pierre Martin
Chair
2003 Montreal Omni Hotel

J.P. Dufey CERN
M. Levine` BNL

Dinner at the Omni Hotel
2005 Stockholm

Richard Jacobsson
Chair

Christian Bohm
Co-Chair

‘Bo YU’ Abstract management system
An interdisciplinary conference on the latest real-time computing applications in plasma physics, nuclear physics, particle physics, astrophysics, space science, accelerators, and in medicine and biology.

Topics
- Ultra Fast Analog and Timing digitizer and converter
- Front-end Signal Processing
- Real Time System Architectures
- Trigger and Data Acquisition
- High Level Triggers
- Event Building and Fast Networks
- High Speed Synchronous Control
- Online Processing Farms
- Online Databases
- Controls and Monitoring Systems
- Emerging Real Time Technologies
- New standards (ATCA)

General Chair: WANG, Yifang, IHEP
General Co-Chair: SHU, Yantai, TJU
Email: r09-chair@ihep.ac.cn
Phone: +86-10-8823-5014
Fax: +86-10-8823-3374
Chair, Local Organizing Committee
LIU, ZhenAn, IHEP
Email: r09-chair@ihep.ac.cn
Phone: +86-10-8823-6718
Fax: +86-10-8823-3083

http://www.ihep.ac.cn/english/conference/rt2009/
Posters
Conference room
Senior Award
Short course
Students award
Great Wall Excursion

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AMU presentation
2009 Beijing Dinners
2009 Beijing

Membership

We have to thanks them!
17th Real Time Conference
IEEE-NPSS Technical Committee
on
Computer Applications in Nuclear and Plasma Sciences
24-28 May 2010, Lisboa, Portugal

ORGANIZED BY

TOPICS
- Ultra Fast Analog and Timing digitizer and converter
- Front-end Signal Processing
- Reconfigurable Hardware
- Real-Time System Architectures
- Trigger and Data Acquisition
- High Level Triggers
- Event Building and Fast Networks
- High Speed Synchronous Control
- Online Processing Farms
- Online Databases
- Controls and Monitoring Systems
- Emerging RealTime Technologies
- New standards (ATCA, etc)

TARGET AUDIENCE
- Particle, Nuclear Physics and Astrophysics
- Nuclear Fusion
- Accelerator
- Medical Physics
- Space
- General Radiation Instrumentation

PARALLEL SESSION
- Tutorials and ATCA Workshop

CONTACT
Office of RT 230
Instituto de Física e Física Nuclear
An Santa Feal
1049-001 Lisboa, Portugal
Phone: +351 21 441 7018
Fax: +351 21 441 7019
E-mail: sritt@ipfn.ist.utl.pt

2010 Lisbon
Bruno Consalves & Carlos Varandas
Stefan Ritt
CANPS Chair

First mini Oral sessions
The modern age (2012 -2020)

<table>
<thead>
<tr>
<th>Year</th>
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<th>CANPS Chair</th>
<th>Award</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>RT-18</td>
<td>Berkeley (US)</td>
<td>S. Zimmermann</td>
<td>Stefan Ritt</td>
<td>Chris Parman</td>
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<tr>
<td>2014</td>
<td>RT-19</td>
<td>Nara (JP)</td>
<td>M. Nomachi</td>
<td>M. Purschke</td>
<td>Chen Yi Chi</td>
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<tr>
<td>2016</td>
<td>RT-20</td>
<td>Padova (IT)</td>
<td>A. Luchetta</td>
<td>M. Purschke</td>
<td>Roger Lecomte</td>
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<tr>
<td>2018</td>
<td>RT-21</td>
<td>Williamsburg (US)</td>
<td>David Abbot</td>
<td>M. Grossmann</td>
<td>T. Friedian</td>
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<td>2020</td>
<td>RT-22</td>
<td>Quy Nohn (VN)</td>
<td>Stefan Ritt</td>
<td>M. Grossmann</td>
<td>J.P. Martin</td>
</tr>
</tbody>
</table>

- HEP & NP, upgrades, non accelerator, XFEL, Fusion, Medical
- Fast front end electronics
- Emerging technologies
- Software trigger, GPU,
- Machine learning
An interdisciplinary conference – real-time data acquisition and computing in the physical sciences applications.

**Key dates:**
- Deadline for abstract submission: March 2, 2012
- Program available: April 2, 2012
- Tutorials and xTCA Workshop: June 9-10, 2012

**Applications Include:**
- High energy physics, Nuclear physics, Astrophysics and astroparticle physics, Nuclear fusion, Medical physics, Space instrumentation, Nuclear power instrumentation, Realtime security and safety, General radiation instrumentation.

**Topics:**
- Realtime system architectures, Intelligent signal processing, Fast data transfer links and networks, Trigger systems, Data acquisition, Processing-farms, Control, monitoring, and test systems, Upgrades, Emerging realtime technologies, New standards, Realtime safety and security, Feedback on experiences.

**Organizers:**
- General Chair: Sergio Zimmermann, LBNL
- Scientific Program Chair: Réjean Fontaine, Université de Sherbrooke
- Treasurer: Henrik von der Lippe, LBNL

**E-mail:** RT2012@lbl.gov

**Hosted by:** Lawrence Berkeley National Laboratory, a national laboratory operated by the University of California for the U. S. Department of Energy.

**Location:** Hotel Shattuck Plaza, Berkeley, CA

2012 Berkeley

Sergio Zimmermann
Chair
2012 Berkeley

Chris Parkman award

Students awards

Napa valley excursion

19 Oct 2020
1st Remote tutorial

Senior Award

AMU presentation

Students Awards
... and the 1st School on Real-Time Systems

International school on real-time systems in Osaka
2-7 June 2014
20\textsuperscript{th} IEEE-NPSS
REAL TIME CONFERENCE
06-10
JUNE
2016

PADOVA - ITALY

Deadline for abstract submission: 14 FEBRUARY 2016

WORKSHOPS/TUTORIALS
Workshops and tutorials on 5 June 2016.

ORGANIZERS
General Chair
Adriano Luchetta, Consorzio RFX, Padova

Executive Committee
Mart\textsuperscript{i} Purschke, BNL
Adriano Luchetta, Consorzio RFX
David Abbott, Jefferson Lab
Marco Bellato, INFN Padova
R\text{\'e}my Fontaine, Universit\text{'e} de Sherbrooke
Patrick Le Du, IPN Lyon
Zhen An Liu, IHEP
Gabriele Manduchi, Consorzio RFX
Niko Neufeld, CERN
Stefan Ritt, Paul Scherrer Institute
Local Organizing Committee
Gabriele Manduchi, Consorzio RFX
Margherita Basso, Consorzio RFX

APPLICATIONS INCLUDE
High energy physics, Nuclear physics,
Astrophysics and astroparticle physics,
Nuclear fusion, Medical sciences,
Space instrumentation, Real-time
security and safety, General radiation
instrumentation.

http://www.lgi.cnr.it/rt2016
email: rt2016@lgi.cnr.it

Adriano Luchetta
Chair

Martin Purschke
CANPS Chair
Padova 2016
University plenary session

Senior Award
Roger Lecomte

Student Awards
21ST IEEE REAL TIME CONFERENCE
Colonial Williamsburg, Virginia - USA

JUNE 11-15, 2018

APPLICATIONS:
High Energy Physics, Nuclear Physics, Nuclear Fusion, Nuclear Power Instrumentation, Astrophysics and Astro-Particle Physics, Space Instrumentation, Medical Physics, General Radiation Instrumentation, Real-time Security and Safety.

TOPICS:
- Emerging Technologies
- New Standards
- Data Acquisition
- Upgrades
- Feedback on Experiences
- Control, Monitoring, Test and Real Time Diagnostics Systems
- Trigger Systems
- Real-Time System Architectures and Intelligent Signal Processing
- Fast Data Transfer Links and Networks
- Front-End Electronics and Fast Digitizers
- Processing Farms
- Real Time Simulation

WORKSHOP/TUTORIALS:
JUNE 9-10, 2018

ORGANIZERS:
GENERAL CHAIR:
David Abbott (Jefferson Lab)

EXECUTIVE COMMITTEE:
Martin Grossmann (PSI)
David Abbott (Jefferson Lab)
Martin Porschke (BNL)
Patrick Le Dû (IPR Lyon)
Ryuki Fontaine (Université de Sherbrooke)
Zheng An Liu (HEP)
Pierre Arnaudru (TRIUMF)
Sasha Schmelting (CERN)
Christian Böhm (University of Stockholm)
Stefan Reit (PSI)

Email: rt2018@jlab.org
https://indico.cern.ch/e/rt2018

AMU presentation
2018 Williamsburg

Senior Award

Student Award

First WIE session
**CANPS Committee in 2020**

Abbott, David, Jefferson Lab
Amaudruz, Pierre-André, Triumf
Bohm, Christian, University of Stockholm
Calvet, Denis, CEA Saclay
Drake, Gary, Argonne
Erickson, Keith, Princeton
Fontaine, Rejean, Université Sherbrooke
Fox, Ron, Michigan State University
Goncalves, Bruno, IPFN Lisbon
Grossmann, Martin, Paul Scherrer Institute
Hai, Vo Hong, Vietnam National University
Huffer, Mike, SLAC
Itoh, Ryosuke, KEK
Jezynski, Tomasz, DESY
Kuehn, Wolfgang, Uni Giessen
Larsen, Ray, SLAC
LeDû, Patrick, CEA Saclay (retired)
Levinson, Lorne, Weizmann Institute

Liu, Ted, Fermilab
Liu, Zhen’An, IHEP Beijing
Luchetta, Adriano, Consorzio RFX, Euratom ENEA
Makowski, Dariusz, Lodz University of Technology
Neufeld, Niko, CERN
Nomachi, Masaharu, Graduate school of science
Paoletti, Riccardo, University of Siena and INFN Pisa
Purschke, Martin, Brookhaven National Laboratory
Rehlich, Kay, DESY
Ritt, Stefan, Paul Scherrer Institute
Schmeling, Sascha, CERN
Shu, Yantai, Tianjin University
Tang, Fukun, University of Chicago
Tetrault, Marc-Andre, Harvard
Varela, Joao, CERN
Vega, Jesus, EURATOM/CIEMAT
Wu, Jin-Yuan, Fermilab
Zimmermann, Sergio, LBNL

36 ‘appointed’ Members
- 14 North America
- 16 EU /R8
- 6 Asia

Martin Grossmann
Canps Chair

19 Oct 2020
AMU presentation
Conclusions

- I enjoyed very much to be part of this adventure over the last 27 years.
- I met a lot of incredible people.
- RT is a great ‘small’ human conference with a lot of opportunities for young people to participate to the organisation.