



International Federation of Automatic Control

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Newsletter

Fault Detection, Supervision and Safety for Technical Processes - SAFEPROCESS 2009

IFAC Symposium

Barcelona, Spain, June 30 – July 3, 2009

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SAFEPROCESS 2009

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Automatica

<http://www.elsevier.com/locate/automatica>

Control Engineering Practice

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Engineering Applications of Artificial
Intelligence

<http://www.elsevier.com/locate/engappai>

Journal of Process Control

<http://www.elsevier.com/locate/jprocont>

Annual Reviews in Control

<http://www.elsevier.com/locate/arcontrol>

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The IFAC SAFEPROCESS Symposium series is devoted to fault detection, diagnosis and safety of technical processes. The first symposium took place in Baden-Baden in 1991. This was followed, at three-year intervals, by Helsinki, Hull, Budapest, Washington and Beijing. At the invitation of the Spanish NMO of IFAC, Barcelona was selected as the venue of the 2009 Symposium.

The National Organizing Committee was chaired by Joseba Quevedo, of the Technical University of Catalonia. The key members of the NOC were Teresa Escobet, Bernardo Morcego, Vicenc Puig and Andreu Quesada, responsible for local arrangements, computer support, publications and finances, respectively. They were supported by a large group of enthusiastic young people.

An International Program Committee was set up, with Janos Gertler as chair, Ron Patton as co-chair and Alf Isaksson as industrial vice-chair. The IPC had 28 additional members. This was a "working" IPC; the subject area was subdivided into sub-areas and each IPC member had full responsibility for the papers in one of those sub-areas, obtaining reviews and making acceptance/rejection recommendations. Invited session proposals were solicited and 14 of those received by the IPC. The papers in the invited sessions were subjected to the same individual reviewing and acceptance/rejection decisions as the contributed papers. Thirteen of the invited sessions finally materialized, several of them supplemented with appropriate contributed papers, in place of the invited ones rejected in the reviewing process.

A total of 381 regular paper submissions were received, 90 for the invited sessions and 291 contributed directly by the authors. Due to the diligent work of the members of the IPC, 1039 reviews were obtained, an average of 2.72 per paper. 68 invited and 198 contributed papers were finally accepted. Of the latter, 8 were then withdrawn before the Symposium and 3 were scheduled but not presented ("no show"). The papers were arranged into 45 sessions (13 invited and 32 contributed) that took place in five parallel tracks.

The IPC and NOC placed a great emphasis on the selection of plenary and semi-plenary subjects, and the invitation of outstanding people to present them. Three plenary and six semi-plenary lectures were arranged, most of them dealing with various application areas.

The 3 plenaries were:

- Fault Detection and Isolation in Nonlinear Systems, by Jozsef Bokor (Hungary)
- Airbus State of the Art and Practices on FDI and FTC, by Philippe Goupil (France)
- Data-driven Fault Detection and Diagnosis for Complex Industrial Processes, by Joe Qin (USA)

The 6 semi-plenaries were:

- Diagnosis and Prognosis of Automotive Systems: Motivations, History and Some Re

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- sults, by Giorgio Rizzoni, Simona Onori and Matteo Rubagotti (USA)
- Fault Diagnostics and Security of Critical Infrastructure Systems, by Marios Polycarpou (Cyprus)
- Integrated Design of Control Structures and Embedded Diagnosis, by Steven Ding (Germany)
- Strategies and Techniques for Safety and Performance Monitoring on Railways, by Clive Roberts and Roger M. Goodall (UK)
- Fault Detection and Isolation in Sewer Networks, by Vicenç Puig (Spain)
- Fault Tolerant Actuators and Drives, by Marco Muenchhof, Mark Beck and Rolf Isermann (Germany)

In addition to the plenaries, Rolf Isermann gave a review at the opening session of the history of the Safeprocess Symposia, and his perspective on the state of the art.

The authors of the papers presented at the symposium came from 44 countries. Many papers had an international team of authors, thus it is difficult to talk of the distribution of papers by country.

A significant innovation was the introduction of two symposium awards. The Paul Frank Award for the Best Theory Paper was established by the University of Duisburg-Essen, to commemorate the pioneering contributions of the late Professor Frank to the theory of fault detection and diagnosis. The ABB Best Application Paper Award was sponsored by the ABB Company. Either award carries a certificate and a cash-prize of 1000 Euros. Appreciation is due to Steven Ding and Alf Isaksson who negotiated the sponsorship of the awards with their respective organization.

Two award selection committees were set up, Ron Patton chairing the Frank Award committee and Rolf Isermann the ABB Award committee. They selected 5 resp. 6 finalists (who also received a certificate), based on the written papers and the reviews, then made their final selection of the winner after listening to the presentations. The winners and finalists are:

Paul Frank Best Theory Paper Award

Winner:

Subspace-based Fault Detection and Identification for LPV Systems, by
Jianfei Dong, Balazs Kulcsar, Michel Verhaegen

Finalists:

Structured H_{∞}/H - LPV Filters for Fault Diagnosis: Some New Results, by David Henry, Alexandre Falcoz, Ali Zolghadri
Fault Diagnosis for Takagi-Sugeno Nonlinear Systems, by Dalil Ichalal, Benoit Marx, Jose Ragot, Didier Maquin
Fault Diagnosis of a Class of Uncertain Nonlinear Systems with Lipschitz Nonlinearities, by Xiaodong Zhang, Marios M. Polycarpou, Thomas Parisini
A Randomised Subsampling Method for Change Detection, by Erik Weyer, Sangho Ko, Marco Campi

ABB Best Application Paper Award

Winner:

Flight Control Reconfiguration Based on a Modular Approach, by
Thomas Lombaerts, Quping Chu, J.A. (Bob) Mulder, Diederick Joosten

Finalists:

Nonlinear Observer-Based OFC Detection for A380 Aircraft, by Efraim Alcorta-Garcia, Ali Zolghadri, Philippe Goupil, Loic Lavigne, Pascal Simon

Automotive Battery State-Of-Health Monitoring: A Parity Relation Based Approach, by Xiaodong Zhang, Ryan Grube, Kwang-Keun Shin, Mutasim Salman, Robert Conell

Combining Stochastic Automata and Classification Techniques for Supervision and Safe Orchard Navigation, by Fabio Caponetti, Mogens Blanke

Comparison between Leak Detection Methods for Open Water Channels, by Nadia Bedjaoui, Erik Weyer

A Study of Rolling-Element Bearing Fault Dia-

gnosis Using Motor's Vibration and Current Signatures, by Zhenyu Yang

The Symposium was attended by 301 participants; this is a record in the 21 year history of Safeprocess. Of these, 187 paid full registration and 76 paid student registration (the rest were free registrations, including the local organizing team and the plenary speakers). The participants represented 38 countries. The most populous group came from France (66), followed by Spain (50), Germany (24), USA (16) and Denmark (15).

Most of the plenary/semi-plenary lectures were really outstanding. The technical sessions were of very good quality. The award selection committees complained that they had a difficult task to pick the winner since there were so many good papers. The technical arrangements in the lecture rooms were perfect. It was the general feeling of the participants that the overall technical level of the symposium surpassed any and all of the past SAFEPROCESS Symposia.

Several papers that were presented at the Symposium are being proposed to the various IFAC Journals for publication.

The participants were treated to a welcoming and farewell reception at the hotel, and lots of coffee and nibbles in the session breaks. Following a quick sight-seeing tour, the symposium banquet took place at an excellent sea-side restaurant. The winners and finalists of the awards were recognized at the banquet. One of the highlights of the evening was a rendition of La Cucaracha by the Safeprocess Trio, Joseba Quevedo, Ron Patton and Cristina Verde (NOC Chair of Safeprocess 2012, Mexico City).

Barcelona, of course, is an ideal location. While most hard-core Safeprocess enthusiasts would probably have gone to wherever the meeting was organized, it was certainly a great extra bonus to get Barcelona as part of the conference package.

Janos Gertler

Aerospace Guidance, Navigation and Flight Control Systems IFAC Workshop Samara, Russia, 30 June - 2 July, 2009



The IFAC Workshop "Aerospace Guidance, Navigation and Flight Control Systems" (30.06.2009 - 2.07.2009, Samara Scientific Center, Russian Academy of Sciences, Samara, Russia) was associated with important jubilee dates for leading Russian space companies - State Research-Production Rocket-Space Center "TsSKB-Progress" and JSC "Information Satellite Systems" Reshetnev Company. A major goal of the Workshop was to bring together the aerospace researchers

and engineers for discussion of contemporary research and developments in aerospace guidance, navigation and flight control systems. Topics of the Workshop included:

- Aircraft guidance, navigation and flight control;
- Launcher & Missile guidance and flight control;
- Spacecraft guidance, navigation and flight control;

- High accuracy pointing in aerospace engineering;
- In-flight calibration of the spacecraft onboard systems;
- Nonlinear dynamics of flight control systems;
- Onboard control algorithms implementation.

The following speakers presented the plenary papers:

A. Kirilin (Russia). The SRP RSC "TsSKB-Progress": Trends and Future Prospects;

V. Peshekhonov (Russia). Autonomous Attitude Reference System for Remote Sensing Satellites;

K. Schilling (Germany). Networked Distributed Pico-Satellite Systems for Earth Observation and Telecommunication Applications;

Ye. Somov (Russia). Nonlinear Dynamics of the Spacecraft Gyromoment Control System with Plasma Thrusters at Initial Modes;

V. Rutkovsky (Russia). Adaptive Control Systems of Large Space Structures with Variable Parameters;

G. Bertoni (Italy). Guidance and Nonlinear Active Fault Tolerant Control for a General Aviation Vehicle.



FORTHCOMING EVENTS*

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Title	2010	Place	Further Information
IFAC/ASHRAE Conference Control Methodologies and Technology For Energy Efficiency (IFAC CMTEE 2010)	March 29 – 31	Vilamoura Portugal	http://www.cmtee.org/ e-mail: info@cmtee.org
8th ENIM/IFAC - Intl. Conference Modelling and Simulation – MOSIM 2010	May 10 – 12	Hammamet Tunisia	http://www.enim.fr/mosim10 e-mail: mosim10@enim.fr
IFAC Workshop Time Delay Systems – TDS 2010	June 07 – 09	Prague Czech Rep.	http://www.tds2010.fs.cvut.cz/ e-mail: tds2010@fs.cvut.cz
IEEE/IFAC Workshop Variable Structure Systems – VSS 2010	June 26 – 28	Mexico City Mexico	http://www.vss2010.unam.mx/ e-mail: gchair@unam.mx
American Control Conference - in cooperation with IFAC -	June 30 July 02	Baltimore MD, USA	http://www.a2c2.org/conferences/acc2010/
IFAC Workshop Intelligent Manufacturing Systems – IMS	July 01 – 02	Lisbon Portugal	http://www.ims10.ipb.pt/ e-mail: ims2010@uninova.pt
IFAC Symposium Dynamics and Control of Process Systems - DYCOPS	July 05 – 07	Leuven Belgium	http://www.dycops2010.org/
IFAC/(EFB) Symposium Computer Applications in Biotechnology	July 07 – 09	Leuven Belgium	http://www.cab2010.org/
IFAC Symposium Large Scale Systems: Theory and Applications – LSS 2010	July 11 – 14	Villeneuve d'Ascq France	http://lss2010.ulbsibiu.ro/ e-mail: p.borne@ec-lille.fr
IFAC Symposium Advances in Automotive Control - AAC	July 12 – 14	Munich Germany	http://www.vdi.de/aac2010 e-mail: ringelmann@vdi.de
IFAC Symposium Mining, Mineral and Metal Processing -IFACMMM2010	August 02 – 04	Cape Town South Africa	http://www.ifacmmm2010.com/index.html e-mail: info@ifacmmm2010.com
IFAC Workshop Discrete Event Systems	August 30 September 1	Berlin Germany	http://www.wodes2010.org/ e-mail: info@wodes2010.org
IFAC Symposium Analysis, Design, and Evaluation of Human-Machine Systems- HMS	August 31 - Sept. 03	Valenciennes France	http://www.univ-valenciennes.fr/IFACHMS2010/ e-mail: contact-ifachms2010@univ-valenciennes.fr
IFAC Symposium Nonlinear Control Systems - NOLCOS 2010	September 01 - 03	Bologna Italy	http://www.nolcos2010.unibo.it/ e-mail: imarconi@deis.unibo.it
IFAC Symposium Cost Oriented Automation – COA 2010	September 01 – 03	Prague Czech Rep.	http://ifac.cz/coa/ e-mail: to be announced
IFAC Symposium Intelligent Autonomous Vehicles - IAV	September 06 - 08	Lecce Italy	http://iav2010.unile.it/ e-mail: iav2010@unile.it
IFAC Symposium Automatic Control in Aerospace	September 06 – 10	Nara Japan	http://www.space.t.u-tokyo.ac.jp/aca2010 e-mail: ifac-office@space.t.u-tokyo.ac.jp
IFAC Conference Management and Control of Production and Logistics – MCPL-2010	September 08 – 10	Coimbra Portugal	http://www.dei.uc.pt/MCPL2010 e-mail: mcpl2010@dei.uc.pt
IFAC Symposium Mechatronic Systems	September 13 – 15	Boston, MA USA	https://engineering.purdue.edu/IFACMech10/ e-mail: to be announced
IFAC Symposium System Structure and Control	September 15 – 17	Ancona Italy	http://leibniz.diiga.univpm.it/SSSC10/ e-mail: to be announced
IFAC Conference Control Applications in Marine Systems - CAMS 2010	September 15 – 17	Rostock Germany	http:// to be announced e-mail: to be announced
IFAC Symposium Telematics Applications – TA'2010	October 05 – 08	Timisoara Romania	http://www.upt.ro/ta2010 e-mail: office.ta2010@aut.upt.ro
IFAC Workshop (4th) Fractional Differentiation and its Applications - FDA	October 18 – 20	Badajoz Spain	http://ees.fberg.tuke.sk/fda10 e-mail: to be announced

* A complete list of IFAC events will be published in the next issue of the IFAC Newsletter

Call for Fellow Nominations 2010

TO IFAC FELLOW NOMINATORS

If you plan to submit an IFAC Fellow Nomination Form, please find instructions below to assist you in this nomination process. Strict adherence to this procedure is essential; otherwise, a candidate may be placed at a serious disadvantage and possibly even excluded from consideration. For a list of IFAC Fellows elected so far, please go to the IFAC website at:

<http://www.ifac-control.org/awards/ifac-fellows>

Nominator

Any person is eligible to serve as a nominator with the exception of members of the Fellows Selection Committee (for a list of the FSC members go to <http://www.ifac-control.org/awards/ifac-fellows>), and IFAC Council Members. The nominator is responsible for the information provided. The nominator is asked to read the Nominator Information, complete the Nomination Form according to the requirements given below and to alert the persons given as references that they have been named referees.

Fellow Nomination Forms must reach the IFAC Secretariat (by e-mail: secretariat@ifac-control.org) by

December 31, 2009

Fellow Candidates

The IFAC Fellow award provides a distinction of excellence in the Federation and is conferred to a small number of outstanding scientists or engineers by the IFAC Council, based on the proposal of the Fellow Selection Committee (FSC). The FSC Committee shall consider:

1. Outstanding and extraordinary individual contributions in the fields of interest of IFAC in the role as an Engineer/Scientist, Technical Leader or Educator. These achievements shall be recorded as technical publications, patents, reports, systems products, applications, services and demonstrable teaching innovations.
2. Opinions of Fellow references.
3. Involvement in IFAC activities.

Any control scientist or engineer can be a candidate for the IFAC Fellow position. Past involvement in IFAC activities, publications and events is relevant and desirable but not mandatory. Current members of the Fellow Selection Committee (FSC) are not eligible to be considered as Fellow Candidates; in addition, the President and President-Elect of IFAC are not eligible to be nominated/considered for selection as Fellows, but other IFAC Council members could be nominated and selected. In this case, any candidate Council Members would be obliged to excuse themselves from any form of participation in any selection process of IFAC Fellows.

References

A nomination must be supported by at least three, but no more than five references from internationally reputed experts in the field who are aware of the Candidate's contributions. It is to be noted that the choice of referees is important for the success of the candidate's nomination. Members of the IFAC Council and the Fellow Selection Committee are not eligible to serve as referees. If you have been asked to act as reference, please read the Reference Information and complete the Reference Form

Fellow Reference Forms must reach the IFAC Secretariat (by e-mail: secretariat@ifac-control.org) by

February 1, 2010

All the above mentioned documents (Nominator Information, Nomination Form, Reference Information, Reference Form) are available for download from the IFAC website at

<http://www.ifac-control.org/awards/fellow-nomination-2010>

New Fellows Announcement

The election of newly elected Fellows will be announced shortly after the completion of the selection process carried out by the IFAC Council. IFAC will inform all candidates and their nominators of the election results by e-mail and/or first class mail. Nominators of unsuccessful candidates will be notified by e-mail and/or first class mail.