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Newsletter

Contents:

IFAC Technical Committees and their Scopes	*
Mechatronic Systems IFAC Conference Germany, September 2000	*
In Memoriam – Pieter Eykhoff 1929 – 2000	*
Control Applications of Optimization IFAC Workshop Russia, July 2000	*
Forthcoming Events	*
Papers from Automatica, Nos 12/2000 & January 2001	*
Papers from Control Engineering Practice, Nos 11 & 12 2000	*
Automated Systems Based on Human Skills – Joint Design of Technology and Organisation IFAC Symposium Germany, June 2000	*
Advanced Control of Chemical Processes – ADCHEM IFAC Symposium Italy, June 2000	*
Control Engineering Textbook Prize Endowed in Honor of Harold Chestnut, First President of IFAC Call for Nominations	*
Who is Who in IFAC	

IFAC Technical Committees and their Scopes

In the last issue of the IFAC Newsletter we started with the presentation of the nine Coordinating Committees. In this issue we present the Coordinating Committee on Manufacturing and Instrumentation. In case of this Coordinating Committee, we have recently had an addition of a new TC, i.e. the TC on Mechatronics.

Coordinating Committee on Manufacturing and Administration



Chair: A. Ollero, Spain
aollero@cartuja.us.es

Technical Committee on Manufacturing, Model, Management and Control



Chair:
S. Nof
USA
nof@ecn.purdue.edu

Technical Committee on Advanced Manufacturing Technology



Chair:
G. Morel
France
gerard.morel@cran.u-nancy.fr

Promotes development of formal descriptive and prescriptive models of manufacturing systems. Includes simulation (discrete-event, continuous, graphic, and emulation) and optimization as well as knowledge-based models. Manufacturing models promote architecture design for production control, process supervision, quality assurance, and maintenance. Process models address process and production planning/control, job/activity scheduling, and logistics. Communication- and Internet-based models support both production and process issues.

Promotes the main paradigms, techniques, and technologies to focus on automated manufacturing systems and "shop floor manufacturing" processes. Emphasis on automatic control and automation engineering aspects of advanced manufacturing processes that improve flexibility, integration, and adaptability of automated manufacturing. Existing and new concepts, theories, models, methods, methodologies, languages, and tools applied to manufacturing.

Technical Committee on Robotics



Chair:
J. Sasiadek
Canada
jsas@ccs.carleton.ca

Addresses all robotics-related topics with special emphasis on four major areas: manipulators (or stationary robots), mobile and flying robots, autonomous systems, and telerobotics. Includes sensor and information fusion, guidance, navigation and control, path and trajectory planning, motion control, kinematics, dynamics, force control, and virtual robotics. Typical applications include manufacturing, space, UAV (Unmanned Aerial Vehicles), UGV, underwater, remote manipulators, biomedical, and agriculture.

Technical Committee on Enterprise Integration



Chair:
P. Bernus
Australia
bernus@cit.gu.edu.au

Fosters research into enterprise integration and identifies theoretically sound and practically viable techniques for development of integrated enterprise. Research addresses reference architectures, engineering methodologies, modelling and generic enterprise models. Investigates a Unified Enterprise Modelling Language to potentially support exchange of enterprise models among various user communities. Also addresses development of reusable reference models for virtual enterprises.

Technical Committee on Components and Instruments



Chair:
S. Boverie
France
serge.boverie@at.siemens.fr

Season's Greetings to all Newsletter Readers



Fosters components and instruments for process control, robotics & automation, environmental systems, automobile & other transportation vehicles, mobile robots, and human assistance. Includes intelligent perception devices, positioning components (such as GPS), intelligent controllers, smart actuators, micro-electro-mechanical & mechatronic components, systems buses and interconnection systems. Also addresses component and instrument diagnosis, self-diagnosis, auto-configuration, measurement validation, multi-sensor diagnosis & data fusion, and learning.

Technical Committee on Low Cost Automation



Chair:
H. Erbe
Germany
erbe0232@mailszrz.zrz.tu-berlin.de

Promotes cost effective reference architectures and development approaches for production and transportation that properly integrates human skill and technical solutions. Includes shop floor production support and decentralized process control strategies. Addresses automation integrated with information processing as well as automation of non-sophisticated and easily handled operations for productive maintenance.

Technical Committee on Mechatronics



Chair:
R. Goodall
United Kingdom
r.m.goodall@lut.ac.uk

Promotes integration of mechanics with electronics and information processing; merges components (hardware) and information-driven functions (software). Balances basic mechanical structures, sensor & actuator implementation, digital processing, and control to achieve efficient, high-performance, innovative solutions generally impossible with mechanics or electronics alone.

Visit the newly designed IFAC Homepage

The IFAC homepage has been "facelifted" to match the requirements of the new millennium. The homepage has been redesigned by Alfons Crespo and his team from Valencia Polytechnical University. IFAC work is presented, links to meeting homepages, Technical Committees and all other aspects of IFAC work are given.

As before, the IFAC Homepage can be found at

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

Mechatronic Systems IFAC-Conference

Darmstadt Germany, 18-20 September 2000

Many technical processes and products in the area of mechanical and electrical engineering show an increasing integration of mechanics with electronics and information processing. This integration is performed by the components (hardware) and by information-driven functions (software). The resulting integrated systems are called *mechatronic systems*. During their development an attempt is made to find an optimal balance between the basic mechanical structure, sensor and actuator implementation, automatic digital information processing and overall control and possibly to create synergetic effects.

Because of these fundamental developments the IFAC-National Member Organization, the VDI/VDE-Gesellschaft für Mess- und Automatisierungstechnik (GMA) and the Special Research Project on Integrated Mechatronic Systems (IMES) at Darmstadt University of Technology, with Rolf Isermann as IPC-chair and Rainer Nordmann as NOC-chair, organized the 1st IFAC Conference on this subject. The conference was opened by IFAC President P. Albertos. Three plenary papers gave an overview of ongoing developments. M. Tomizuka (USA) reported on "Mechatronics: From the 20th to 21st century", A. van Zanten (D) talked on "Improvement on road vehicle handling by mechatronic systems" and R. Goodall (UK) and W. Kortüm (D) presented "Mechatronic developments for railway vehicles of the future". Altogether 196 papers were grouped in 36 sessions with the following main topics:

MECHATRONIC SYSTEMS

- Mechatronic vehicles
- Mechatronic engines and machines
- Mechatronic trains
- Mechatronic space systems

MECHATRONIC COMPONENTS

- Mechatronic actuators and devices
- Magnetic bearings

ROBOTS AND WALKING MACHINES

- Mechatronic robots
- Mobile robotic systems
- Walking machines

DESIGN OF MECHATRONIC SYSTEMS

- Modeling and identification
- Software tools
- Real time and hardware-in-the-loop simulation

AUTOMATIC CONTROL OF MECHATRONIC SYSTEMS

- Control methods
- Motion and vibration control
- Fault detection and diagnosis of mechatronic systems

GENERAL MECHATRONIC ISSUES

- Man-machine-interfaces for mechatronic systems
- Education for mechatronic systems
- Special research program of Integrated Mechanical Electrical Systems (IMES) at Darmstadt University of Technology
- Discussion

Furtheron, panel discussion sessions on "Role of mechatronics for engineering" and "Education for mechatronics" supplemented the technical sessions.

Most sessions per topic were within the area of Mechatronic Vehicles (automobiles and trains) followed by Mechatronic Engines and Machines, Mechatronic Actuators and Devices, Mechatronic Robots, Modeling and Identification and Control Methods. Other focal points were e.g. Magnetic Bearings, Motion and Vibration Control, Software Tools, Hardware-in-the-loop Simulation, Man-Machine Interface and Education for Mechatronic Systems. Hence, both research and development of mechatronic systems in different areas as well as design methodologies are represented by the contributions to this conference. Out of the regular program a special session gave a summary of a 12-year special research program IMES of 10 cooperating institutes at Darmstadt University of Technology funded by the "Deutsche Forschungsgemeinschaft". Also the panel discussion on "Role of mechatronics for engineering" showed the great influence of mechatronic design for many modern products and processes. The panel discussion on "Education for mechatronics" indicated that there is currently not a special way how mechatronics is taught. However, various university programs were presented and the demand for interdisciplinary education as well for electrical and electronic engineering as for mechanical engineering and computer science was pointed out. In the closing session a summary of the main results of the subject areas A to F was given by G.L. Gissinger (F), M. Hiller (D), L. Guzzella (CH), P.J. Fleming (UK), M. Kochem (D) and R. Nordmann (D). Several panelists concluded that the 1st IFAC-Conference on Mechatronic Systems was very successful and important for the general development in engineering and also for automatic control systems.

As not all of the papers could be presented in the usual form within a 3-day-conference. 151 papers were presented in time slots of about 25 minutes and 43 poster presentations were presented within 7 minutes and additionally by discussions at the poster boards. Hence, the poster presentations were integrated in the normal sessions.

The number of participants was 335 from 26 countries. 180 participants came from the host country and 155 from other countries. The countries with most participants except the host country were the Netherlands, the United States, France, Japan, United Kingdom, Switzerland, Sweden, Italy, Portugal, Spain, and Finland. It was interesting to see that about 29% of the participants came from industry, mainly Germany, the United States, France and Switzerland.

Special technical visits of the special research program "Integrated Mechatronic Systems" (IMES) at Darmstadt University of Technology were arranged, showing teststands e.g. for magnetic bearings, hydraulic brake system, dynamic Diesel engines control, smart tire and wheel suspensions with electromagnetic wheel brakes, centrifugal pump measurement techniques, stall avoidance in axial flow turbo compressors, compound semiconductor sensor technology and the design of application-specific microelectronics.

The social program consisted of a reception by the mayor of the city of Darmstadt and a medieval knightsmeal at Castle Auerbach where

In Memoriam – Pieter Eykhoff

9 April 1929 – 15 November 2000



We are very sad to inform the IFAC community that Pieter Eykhoff, an eminent scientist, a man who was instrumental in shaping IFAC to become the successful Federation it is today and at the same time a dear friend to many of us, passed away on 15 November, 2000.

Born in 1929 he received part of his education at Delft University of Technology, where he acquired, with distinction, a M.Sc. degree in Electrical Engineering in 1956. In January 1961 he obtained a Ph.D. degree at the University of California, Berkeley, USA. Upon invitation of the National Academy of Sciences, he stayed at the University of California as a visiting Research Fellow from 1958 until 1960.

In June 1964 he was appointed Professor in the Department of Electrical Engineering of the Eindhoven University of Technology (EUT), in charge of Measurement and Control Engineering. His research interest was focused on Identification and System Parameter Estimation with applications in the industrial area. He was instrumental also in launching the Symposium series on this subject.

He published a book "System Identification, Parameter and State Estimation", Wiley, 1974, with a Russian, Chinese, Polish and Romanian translation and he edited "Trends and Progress in System Identification", Pergamon, 1981. He was a Visiting Professor at the University of Waterloo, Ontario, Canada (1968) and at Kyoto University (1974 and 1985). He lectured in many countries including the USA, Canada, the USSR, Japan, the People's Republic of China, Chile, Brazil, Morocco.

From 1977/1989 he was Dean of the Department of Electrical Engineering, EUT. He was a Fellow of the IEEE, Honorary Professor of Xi'an Jiaotong University, Xi'an, P.R. China, Member of the Royal Netherlands Academy of Arts and Sciences, as well as Doctor honoris causa, Free University Brussels. In the course of his career he has received many more distinctions and honours.

In IFAC Professor Eykhoff was Member of the Executive Council, and a Member of the IFAC Publications Managing Board since its conception. He took the initiative and was instrumental in establishing the IFAC One-Publisher scheme which is still in operation. He also authored and co-authored several IFAC brochures and edited the anniversary publication "IFAC 20 Years Old, 20 Years Young". He was present when the contract was signed which installed the IFAC Secretariat in Laxenburg, Austria. In 1999, at the IFAC World Congress in Beijing, Pieter Eykhoff was appointed Advisor of IFAC. The official title as Advisor only came last year, but it is a fact that Pieter's expertise, his knowledge of IFAC and its development and first and foremost his deep loyalty and friendship were available to IFAC through all these years.

All of us who knew him will remember and miss him as the excellent scientist and teacher but first and foremost as the friend he was.

Gusztav Hencsey, Newsletter Editor

The essential feature of the workshop was the treatment of the new important problems of natural sciences and development of algorithms for their solution. The plenary report "Random Variables and Stochastic Processes" with the new results concerning the structure of the continuous distributions space and methods of statistical analysis of control processes, was presented by Corresponding Member of RAS V.I. Zubov (Saint-Petersburg State University). The main topics of a significant number of presentation were various aspects of optimization implementation in practical problems.

A number of presentations concerned the development of the new mathematical methods in control theory and their applications to charged particles beams dynamics optimization in accelerators. Problems of computing, engineering and paper making systems optimization, satellites, ships and robots control, TOKAMAK plasma control, as well as optimization problems in marine autopilot design were discussed.

Much interest was stimulated by the reports on differential algebra methods and their application to the control theory and verified control of near-earth asteroid orbits. Several reports dealt with applications of Non-smooth Analysis to Optimal Control and Differential Games. This is a new and promising area of research important from both theoretical and practical points of view.

The presentations in the field of games & stochastic control include papers on new developments in the theory of optimal control under conflict and uncertainty as well as a wide range of applications. An interesting and exciting research was introduced in a couple of papers dealing with the numerical methods for the solution of zero-sum differential games of pursuit-evasion type and construction of attainability sets in such games.

Another relatively new theme emerged in a couple of papers devoted to n-person dynamic and static games. Here the main attention was given to the construction of different refinements of Nash solution on the one hand and learning procedures to establish the stable behavior in such games on the other. A number of papers addressed the problem of optimal solutions in games with uncertain payoffs, vector payoffs and locally optimal decision making. Several fruitful discussions took place during the meeting, where some new interesting approaches to the analysis and design of uncertain dynamical systems were discussed.

In several talks special attention was given to applications of the H-infinity optimization technique to control of stochastic systems, and related topics. New design methods based on Lyapunov approach were proposed for nonlinear uncertain systems. In some contributions new results on stability of uncertain time delay systems were reported. In the "Control theory in socioeconomic systems" session the principal themes of the reports were: idempotent analysis and its applications to control theory, mathematical models of economical processes, economical problems in building.

The closing session confirmed the high level, importance and topicality of the presentations, their relevance to the scope of the Workshop. 15 presentations were recommended for publication in "Automatica" and "Control Engineering Practice".

It was proposed to hold the next IFAC Workshop "Control Applications and Optimization" in Budapest.

IPC Chairman, V.I. Zubov
NOC Chairman, D.A. Ovsiannikov

ctd from page 2

M. Tomizuka was knighted a "Mechatronics Knight". On the day after the conference visits to the Daimler Chrysler Research Center Frankfurt and to Continental Teves Frankfurt were also well frequented.

During the conference, a new IFAC Technical Committee on Mechatronic Systems was founded with R. Goodall as chair. According to an agreement with the organizers of AIM "Advanced Intelligent Mechatronic Systems" this conference series is organized in odd years and IFAC will organize conferences on mechatronic systems in even years. Therefore, the next IFAC-Conference on Mechatronic Systems will take place end of 2002, probably at the University of California at Berkeley. The next AIM will take place on 8-11 July 2001 in Como (Italy).

The organizers were pleased that the participants explicitly expressed their satisfaction with the overall organization.

The program of the conference can still be viewed under:

<http://www.vdi.de/gma/mechatronics2000.htm>

Rolf Isermann
Chair International Program Committee

Control Applications of Optimization

11th IFAC Workshop

St. Petersburg, Russia, July 3-6, 2000

This IFAC Workshop on Control Applications and Optimization was organized by the Faculty of Applied Mathematics-Control Processes and the Institute of the Computational Mathematics and Control Processes of Saint-Petersburg State University. It was sponsored by the IFAC Technical Committee on Optimal Control, the IFAC Technical Committee on Control Design and the Russian Foundation of Basic Research. 171 scientists from educational, scientific and industrial institutions attended the meeting. They had the possibility to listen to 1 plenary report and 26 regular sessions. 1 poster session was offered. Sessions were organized in 4 sections with 157 presentations covering the following topics:

- Stability and control processes,
- Systems and robustness,
- Games & stochastic control,
- Control theory in socioeconomic systems.

The opening of the Workshop took place the morning of July 3rd, abstracts and preprints of the reports were provided to the participants at the registration, and the proceedings volume will be published by Elsevier Science.



FORTHCOMING EVENTS

2000
No. 6
Dec.

Title	2000	Place	Deadline	Further Information
IFAC Workshop Bio-Robotics, Information Technology and Intelligent Control for Bio- production Systems – BIO-ROBOTICS II	Nov. 25 – 26	Osaka area Japan	–	e-mail: nkondo@cc.okayama-u.ac.jp
IFAC Workshop Distributed Computer Control Systems – DCCS 2000	Nov. 29 Dec. 1	Sydney Australia	–	http://www.cse.unsw.edu.au/~dccc2000/ e-mail: sowmya@cse.unsw.edu.au
IFAC/IEEE Symposium 5 th Advances in Control Education ACE – 2000	Dec. 17 – 19	Gold Coast Australia	–	http://www.gu.edu.au/centre/icsl/ace2000/ e-mail: ace2000@me.gu.edu.au
Title	2001	Place	Deadline	Further Information
IFAC Workshop Advances in Automotive Control	March 28 – 30	Karlsruhe Germany	–	e-mail: kiencke@iit.etec.uni-karlsruhe.de
IFAC Workshop Intelligent Manufacturing Systems – IMS 2001	April 24 – 26	Poznan Poland	–	http://www.put.poznan.pl/events/ims2001 e-mail: ims2001@put.poznan.pl
IFAC Workshop Mobile Robot Technology	May 21 – 22	Cheju Korea	15 Jan. 2001	e-mail: ilsuh@email.hanyang.ac.kr
IFAC Workshop Automatic Systems for Building Infra- Structure in Developing Countries	May 21 – 23	Lake Ohrid Macedonia (former Rep. of Yu)	31 Dec 2000	e-mail: georgi@regpro.mechatronik.uni- linz.ac.at
IFAC/CIGR Workshop Artificial Intelligence in Agriculture	June 4 – 6	Budapest Hungary	–	http://fft.gau.hu e-mail: ifarkas@fft.gau.hu
IFAC Symposium 6 th Dynamics and Control of Process Systems – DYCOPS 6	June 4 – 6	Cheju Island Korea, Rep.	–	http://pslab.snu.ac.kr/dycops6 http://atom.ecn.purdue.edu/~dycops6/ e-mail: dycops6@pslab.ac.kr
IFAC Workshop 4 th On-Line Fault Detection and Supervision in the Chemical Process Industries	June 8 – 9	Seoul Korea, Rep.	–	http://pslab.snu.ac.kr/supercpi4 e-mail: superepi4@pslab.snu.ac.kr
IFIP/CIRP/IEEE/IFAC Conference Feature Modelling and Advanced Design- For-The-Life-Cycle-Systems FEATS2001	June 12 – 14	Valenciennes France	–	http://www.univ-valenciennes.fr/LGIL/ FEATS2001/Welcome.htm e-mail: feats2001@univ-valenciennes.fr
IMACS/IFAC Symposium Mathematical Modeling and Simulation in Agricultural and Bio-Industries	June 12 – 14	Haifa Israel	–	http://www.technion.ac.il/technion/agr/ m2sabi01.html e-mail: peo@tx.technion.ac.il
IFAC Conference Computer Applications in Biotechnology – CAB 8	June 24 – 27	Quebec City Canada	–	http://www.gch.polymtl.ca/cab8 e-mail: Michel.Perrier@urpc.polymtl.ca
American Control Conference- ACC01 (in co-operation with IFAC)	June 25 – 27	Arlington Virginia, USA	–	http://acc2001.che.ufl.edu e-mail: krogh@ece.cmu.edu
IFAC Symposium Nonlinear Control Systems – NOLCOS 2001	July 4 – 6	St. Petersburg Russia	–	http://www.ipme.ru/nolcos.html e-mail: nolcos@ccs.ipme.ru
IEEE/ASME Intl. Conference Advanced Intelligent Mechatronics (AIM'01) – in cooperation with IFAC	July 8 – 11	Como Italy	–	http://www.AIM01.unina.it e-mail: siciliano@unina.it
IFAC Conference Control Applications in Marine Systems – CAMS 2001	July 17 – 20	Glasgow UK	15 Jan. 2001	http://www.icc.strath.ac.uk/~cams2001 e-mail: system@icu.strath.ac.uk
IFAC Symposium Large Scale Systems LSS 2001	July 18 – 20	Bucharest Romania	–	http://www.ici.ro/lss2001 e-mail: florinf@ici.ro
IFAC Conference Telematics Applications in Automation and Robotics	July 24 – 26	Weingarten Germany	–	http://www.ars.fh-weingarten.de/ta2001 e-mail: ta2001@ars.fh-weingarten.de
IFAC Workshop Modelling and Control in Environmental Issues	August 22 – 23	Yokohama Japan	15 Feb. 2001	e-mail: nishioka@sfc.keio.ac.jp
IFAC Workshop Intelligent Control for Agriculture Applications	August 22 – 24	Bali Indonesia	–	e-mail: tpphp@indo.net.id
IFAC Workshop Periodic Control Systems	August 27 – 28	Cernobbio/Como Italy	1 Feb. 2001	http://www.elet.polimi.it/PSYCO e-mail: colaneri@elet.polimi.it

FORTHCOMING EVENTS (ctd.)

Title	2001	Place	Deadline	Further Information
IFAC Workshop Adaptation and Learning in Control and Signal Processing	August 29 – 31	Cernobbio/Como Italy	15 Jan 2001	http://www.elet.polimi.it/ALCOSP e-mail: savaresi@elet.polimi.it
IFAC Symposium System Structure and Control	August 29 – 31	Prague CZ	–	http://www.sssc01.cz e-mail: zagalak@utia.cas.cz
IFAC Symposium Automatic Control in Aerospace	Sept. 2 – 7	Bologna/Forli Italy	–	http://ars-sun1.ars.fh-weingarten.de/ifac/ events.html e-mail: bofo2001@deis.unibo.it
European Control Conference – ECC 2001 (in cooperation with IFAC)	Sept. 4 – 7	Porto Portugal	–	http://www.fe.up.pt/ecc2001/ e-mail: chairecc@fe.up.pt
IFAC Symposium 10 th Automation in Mining, Mineral and Metal Processing – MMM 2001	Sept. 4 – 6	Tokyo Japan	–	http://www.isij.or.jp/ifac-mmm2001 e-mail: kuchida@uchi.elec.waseda.ac.jp
IFAC Symposium 4 th Intelligent Autonomous Vehicles – IAV	Sept. 5 – 7	Sapporo Japan	31 December 2000	http://junji.complex.eng.hokudai.ac.jp/~iav01 e-mail: iav01@complex.eng.hokudai.ac.jp
IFAC Symposium Modelling and Control of Economic Systems	Sept. 6 – 8	Klagenfurt Austria	1 March 2001	http://www.econ.uni-klu.ac.at/sme2001 e-mail: sme2001@econ.uni-klu.ac.at
IFAC/IFIP/IFORS/IEA Symposium Analysis, Design, and Evaluation of Human-Machine Systems HMS'2001	Sept. 18 – 20	Kassel Germany	–	http://www.imat.maschinenbau.uni- kassel.de/hms2001/index.html e-mail: HMS2001@imat.maschinenbau.uni- kassel.de
IFAC/IFIP/IFORS/IFR Symposium Information Control Problems in Manufacturing Technologies – INCOM 2001	Sept. 20 – 22	Vienna Austria	20 March 2001	http://www.ihrt.tuwien.ac.at/INCOM/ e-mail: nemetz@ihrtl.ihrt.tuwien.ac.at
IFAC Conference Social Stability: The Challenge of Technological Development	Sept. 27 – 29	Vienna Austria	15 March 2001	http://www.ihrt.tuwien.ac.at/swiis01/ default.htm e-mail: swiis01@ihrt.tuwien.ac.at
IFAC Workshop Control Applications in Post-harvest and Processing Technology – CAPPT 2001	Oct. 3 – 5	Tokyo Japan	31 March 2001	e-mail: ase0@mail.ecc.u-tokyo.ac.jp
IFAC Symposium 6 th Cost Oriented Automation (LCA2001)	Oct. 8 – 10	Düsseldorf Germany	2 January 2001	e-mail: rosenzweig@vdi.de
IFAC Workshop Singular Solutions and Perturbations	Oct. 18 – 20	Bucharest Romania	–	e-mail: nandrei@u3.ici.ro
IFAC Workshop Computation in Economic, Financial and Engineering-Economic Systems	Oct. 22 – 24	Tianjin China	–	e-mail: ifaccef.chinaexporter.org
IFAC Workshop Intelligent Assembly and Disassembly – IAD 2001	Nov. 5 – 7	Gramado Brazil	30 March 2001	http://www.delet.ufrgs.br/iad2001 e-mail: cpereira@delet.ufrgs.br
IFAC Conference New Technologies for Computer Control 2001	Nov. 19 – 22	Hong Kong China	1 April 2001	e-mail: mechan@hkucc.hku.hk
Title	2002	Place	Deadline	Further Information
American Control Conference (in co-operation with IFAC)	May 8 – 10	Anchorage Alaska, USA	15 September 2001	http://www.ent.ohiou.edu/~acc2002 e-mail: rrr@gibbs.cheng.okstate.edu
IFAC WORLD CONGRESS 15th	July 21 – 26	Barcelona Spain	15 June 2001 (paper support) 15 Sept. 2001 (internet- submission)	b'02 Secretariat Internat. Center for Numerical Methods in Engineering Universitat Polytechnica de Catalunya Campus Nord Gran Capita, s/n – Edificio C1 E-08034 Barcelona, Spain http://www.ifac2002.org e-mail: secretariatnoc@b02.ifac2002.org
Title	2003	Place	Deadline	Further Information
IFAC Symposium 6 th Advances in Control Education – ACE 2003	June 16 – 18	Oulu Finland	Nov. 2002	e-mail: leena.yliniemi@oulu.fi http://ntsat.oulu.fi/ace
IFAC Symposium 4 th Robust Control Design – ROCOND 2003	June 25 – 27	Milan Italy	Nov. 2002	e-mail: colaneri@elet.polimi.it http://www.elet.polimi.it/ROCOND2003
IFAC Symposium 13 th System Identification – SYSID 2003	August 27 – 29	Rotterdam NL	1 October 2002	e-mail: p.m.j.vandenhof@tn.tudelft.nl

Papers from the December 2000 Issue

Survey Paper

Invariant Representations of Discrete-time Periodic Systems
(S. Bittanti, P. Colaneri)

Papers

On Closed-loop System Identification Using Polyspectral Analysis Given Noisy Input-output Time-domain Data
(J.K. Tugnait, Y. Zhou)
Extended Ho-Kalman Algorithm for Systems Represented in Generalized Orthonormal Bases
(Z. Szabo, P.S.C. Heuberger, J. Bokor, P.M.J. van den Hof)
Stabilization of Relative Equilibria for Underactuated Systems on Riemannian Manifolds
(F. Bullo)
Adaptive Neural Network Control for Strict-feedback Nonlinear Systems Using Backstepping Design
(T. Zhang, S.S. Ge, C.C. Hang)

Brief Papers

Modified Stochastic Luenberger Observers
(C.S. Hsieh, F.-C. Chen)
Estimating Model Mismatch Overbounds for the Robust Autotuning of Industrial Regulators
(A. Leva, A.M. Colombo)
Mutually Nonblocking Supervisory Control of Discrete Event Systems
(M. Fabian, R. Kumar)
Adaptive Output Feedback Tracking with Almost Disturbance Decoupling for a Class of Nonlinear Systems
(R. Marino, P. Tomei)
Adaptive Estimation of Discrete Time Systems with Nonlinear Parameterization
(F.P. Skantze, A. Kojic, A.-P. Loh, A.M. Annaswamy)
Stability Analysis of Learning Feed-forward Control
(W. R. Velthuis, T.J.A. De Vries, P. Schaak, E.W. Gaal)
On the Two-degree-of-freedom Wiener-Hopf Optimal Design with Tracking and Disturbance Rejection Constraints
(L. Xien, D. Xue, S.K. Tso)

Technical Communiques

On Model and Filter Sensitivity
(P.M. Mäkilä, J. Järvinen)
Synthesized Sliding Mode and Time-delay Control for a Class of Uncertain Systems
(Jian-Xin Xu, W.-J. Cao)
Global Output Feedback Tracking Control for a Class of Lagrangian Systems"
(G. Besancon)

Correspondence

A Comment on "L Infinity Optimal Control of SISO Continuous-time Systems"
(M.-G. Yoon)
Author's Reply: "A Comment on L Infinity Optimal Control of SISO Continuous-time Systems"
(M. Szaier, Z.-Q. Wang)

Book Reviews

Automated Highway Systems, by P.A. Ioannou (S.E. Shladover)
Application of Neural Networks to Adaptive Control of Nonlinear Systems, by G.W. Ng (R. Ballini, F.J. Von Zuben)

Papers from the January 2001 Issue

Survey Paper

Approximate Linearization via Feedback – An Overview
(G.O. Guardabassi, S.M. Savaresi)

Papers

Feedforward Control: A Full Information Approach
(E. Prempain, I. Posthlehwaite)
Inventive Equilibrium Strategies and Welfare Allocation in a Dynamic Game of Pollution Control
(S. Jorgensen, G. Zaccour)

Brief Papers

Asymptotic Stabilization of Linear Plants in Presence of Input and Output Saturations
(F.Z. Chaoui, F. Giri, M.M'Saad)
Finite Spectrum Assignment for Linear Systems with Non-commensurate Time-delays
(Suyama Koichi)
Quadratic Stabilizability of a New Class of Linear Systems with Structural Independent Time-varying Uncertainty
(Sanqing Hu, Jun Wang)
Robust Control of Parabolic PDE Systems with Time-dependent Spatial Domains
(A. Armaou, P.D. Christofides)
Robust Stabilization via Iterative State Steering with an Application to Chained-form Systems
(P. Lucibello, G. Oriolo)
Consistency Analysis of Subspace Identification Methods Based on a Linear Regression Approach
(T. Knudsen)
Generalized Popov Theory Applied to State-delayed Systems
(V. Ionescu, S.-I. Niculescu, J.M. Dion, L. Dugard, H. Li)
An Estimator of the Inverse Covariance Matrix and its Application to ML Parameter Estimation in Dynamical Systems
(B. David, G. Bastin)
Applying the EKF to Stochastic Differential Equations with Level Effects
(J.N.Nielsen, H. Madsen)
Global Output Regulation of Uncertain Nonlinear Systems with Exogenous Signals
(Zhengtao Ding)
Optimal Noncausal Set-point Regulation of Scalar Systems
(A. Piazzoli, A. Visioli)
On Modular Backstepping Design with Second Order Sliding Modes
(A. Ferrara, L. Giacomini)
Freedom in Coordinate Transformation of Exact Linearization and its Application to Transient Behaviour Improvement
(Kenji Fujimoto, T. Sugie)

Technical Communiques

Differential Geometric Condition for Feedback Complete Linearization of Stochastic Nonlinear Systems
(Zigang Pan)
On Feasible Set-membership State Estimators in Constrained Command Governor Control
(C. Angeli, A. Casavola, E. Mosca)

Correspondence

Comments on the Review of the Book "Modern Control System Engineering"
(Z. Gaic, M.Lelic)

Book Reviews

Discrete-event System Theory – An Introduction, by A. Tornambè (J. Lunze)
Robust Control Systems Design Advanced State Space Techniques, by C.-C. Tsui (Yu Li, Maying Yang)

Papers from the November 2000 Issue

Fast Neural Networks for Diesel Engine Control Design
(M. Hafner, M. Schüler, O. Nelles, R. Isermann)
Controller Reconfiguration for Non-linear Systems
(S. Kanev, M. Verhagen)
Estimation and Control of Mechatronic Systems Using Sensitivity Bond Graphs
(P.J. Gawthrop, E. Ronco)
Multi-modelling of an Industrial Steam Generator
(B. Ould Bouamama, M. Staroswiecki, B. Riera, E. Cherifi)
Reproducing Oscillatory Behaviour of a Hydroelectric Power Station by Computer Simulation
(S.P. Mansoor, D.I. Jones, D.A. Bradley, F.C. Aris, G.R. Jones)
Model-based Fault Detection and Isolation for a Gas-liquid Separation Unit
(M. Kinnaert, D. Vrancic, E. Denolin, D.O. Juncic, J. Petrovic)
Adaptive Control of the Filling Velocity of Thermoplastics Injection Moulding
(Y. Yang, F. Gao)
Modelling and Adaptive Control Strategy in a Lactic Fermentation Process
(C. Ben Youssef, V. Guillou, A. Olmos-Dichara)
On Adaptive Smoothing of Empirical Transfer Function Estimates
(A. Stenman, F. Gustafsson, D.E. Rivera, L.Ljung, T. McKelvey)

Book Reviews

IFAC Meeting Papers – Keyword Listing
Real-time Programming
IFAC Workshop, Palma, Spain, May 2000

Index of IFAC Meeting Papers Conference Calendar

Papers from the December 2000 Issue

Design and Experimental Evaluation of a Robust Force Controller for an Electro-hydraulic Actuator via Quantitative Feedback Theory
(N. Niksefat, N. Sepehri)
A Simplified Approach to Force Control for Electro-Hydraulic Systems
(A. Alleyne, R. Liu)
Adaptive Nonlinear Control of Repulsive Maglev Suspension Systems
(C.-M. Huang, J.-Y. Yen, M.-S. Chen)
A Feedback Scheduler for Real-time Controller Tasks
(J. Eker, P. Hagander, K.-E. Arzén)
Improved Estimation in Applications Involving Multiple Independent Goals
(M. Agarwal)
Online-optimized Feed Switching in Semi-batch Reactors Using Semi-empirical Dynamic Models
(B. Schenker, M. Agarwal)
Adaptive Regulation of Super-heated Steam Temperature: A Case Study in an Industrial Boiler
(R.N. Silva, P.O. Shirle, J.M. Lemos, A.C. Goncalves)

Book Reviews

IFAC Meeting Papers – Keyword Listing
Lagrangian and Hamiltonian Methods for Nonlinear Control
IFAC Workshop, Princeton, NJ, USA, March 2000

Index of IFAC Meeting Papers Conference Calendar

Automated Systems Based on Human Skill – Joint Design of Technology and Organisation

7th IFAC Symposium

Aachen, Germany, June 15–17, 2000

Advanced Control of Chemical Processes – ADCHEM

IFAC Symposium

Pisa, Italy, 14–16 June, 2000

This symposium series addresses all aspects that relate automation to the human and his/her social environments. The 7th Symposium in the series was very successfully hosted by the Department of Computer Science in Mechanical Engineering (HDZ/IMA) at the Aachen University of Technology (RWTH) where many significant contributions to this field of research and development have been made during the past two decades. It may be also noted that Aachen is one of the leading German university cities with a strong bias to high technologies, such as advanced production, automation, information and communication technologies etc.

The following main areas were discussed during the Symposium:

1. the role of the individual human operator at his workplace (sessions 1 and 3);
2. networks of work-groups and enterprises (session 4);
3. the impact of control and information technology on society and natural environment (sessions 5 and 6);
4. the control challenge in the 21st century (session 7).

In organisational terms, the symposium work was performed in three plenary sessions, 14 regular sessions, two more informal discussion groups and a series of project-based mini-workshops. Emphasis of several discussions was on regional development in view of global challenges, particularly those triggered by new developments in automation and information technology.

Two of the plenary sessions dealt with topics such as:

- the re-orientation of enterprises from the traditional industries (that were mostly capital-material-, energy- and work-intensive) towards new technologies, (such as typically information, automation and control technology) contributing to the economic development of an entire region (Henning);
- the role of new craft enterprises in modern highly automated and high-tech oriented production (Philipp and Menon);
- successful strategies and models for re-integrating long-term unemployed personnel into the labour market. People who lost their jobs largely due to production automation and high-tech orientation of new enterprises (Vomberg);
- concepts and policies to support a balanced regional development by means of networking technologies for information exchange, transport and mobility (Garibaldi);
- challenges of using new technology, human-machine systems knowledge and control systems concepts in biomedical engineering, with the aim of achieving better medical treatment of patients (Stassen);
- different approaches to experience-based and information-technology supported knowledge management (Jarke).

The presentations on the final plenary session impressively touched these most important issues concerning the advanced technologies and the control challenge of the 21st century

The number of high-quality papers opened a real diversity of interesting topics that will certainly gain increased attention within the IFAC community during the next years and

probably deserve to be dealt with more exhaustively in a survey paper. These reflections were somehow confirmed at the end of the second symposium day when the very well attended annual meeting of the IFAC Technical Committee »Social Impact of Automation« took place, which is the main scientific sponsor of this symposium series. The lively discussion among the TC members present and symposium participants revealed some (re-)emerging topics worth mentioning:

- explicit and more focused consideration of social impacts of automation,
- integration of organisational theory and automation,
- contribution of advanced technology to safe and healthy environment,
- occupational health and safety in relation to automation
- newly emerging cultural aspects of automation, specifically language aspects
- consequences of nuclear energy shut-down.

At the industrial-based workshops of the Symposium, the following projects were discussed:

- the Germany-based ADAPT project OrgTec: the networking of engineering enterprises
- the German-British ADAPT project Learning Region: the networking of SMEs in the area of High Technology and Craft enterprises in the Region of Aachen
- the Germany-based project SENEKA: customer-supplier chains of enterprises and universities across and between countries
- the TEMPUS project ECIS: the networking of administration, universities and enterprises in Lithuania to redevelop industry in the post-socialist era
- the EU-India project: information technology and innovation for regional development in Europe and India.

Presenters in these mini-workshops reported on the projects and their progress. Furthermore, discussions took place on the merits and success of these projects. In this way the projects represented a substantial input of enterprises and industry to the symposium. The industrial emphasis was also in the fact that many non-academics (i.e. people from various firms) presented either applied research and development results or their reflections on a particular topic relevant to the symposium.

The Aachen symposium was planned to be linked in time to the World Engineering Convention, taking place in Hannover, Germany the week after the Symposium (June 19-21, 2000). In fact, the connection between these two events was also in terms of professional contents as some leading international experts - some of them participants of this symposium series - were participating in one of the three professional congresses organised during the World Engineering Convention. Thus, for instance, the Professional Congress »Information and Communication« repeated, although with a more practical engineering emphasis, some of the most important issues that were discussed during the Symposium. The following sentences can be stated as the result of the Symposium and the World Engineering Convention:

The global challenge of information and control technology has profound impact on the way society and industry are to develop: it is the core question of our future how the global networked economy can be governed and organised in a way that it is to the advantage of all people in all nations around the world.

Dietrich Brandt (NOC Chairman)
Janko Cernetic (IPC Chairman)

The ADCHEM 2000 Meeting was held on June 14–16, 2000 in Pisa, Italy. Organized under the auspices of IFAC, ADCHEM (International Symposium on Advanced Control of Chemical Processes) is a continuing series of international meetings held most recently in Banff, Canada (1997), Kyoto, Japan (1994) and Toulouse, France (1991). These meetings have traditionally focused on advances in methods for control and estimation and are part of a three year rotation of IFAC meetings in process control, which also include DYCOPS (Corfu, 1998) and the IFAC World Congress (Beijing, 1999).

The ADCHEM 2000 Symposium brought together researchers and developers of new methodologies in the areas of Dynamics and Control of Process Systems as well as all users of these techniques. The interplay of these perspectives has become much more important in the present and future environment of global industrial competition.

The ADCHEM 2000 Symposium focused on the examination of new methodologies and challenging applications in the following six important areas of dynamics and control of process systems:

- Modeling and Simulation
- Model Based Control
- Realtime Optimization
- Process and Control Monitoring
- Process Identification
- Process Control Applications and Plantwide Control

Modeling and Simulation is a necessary prerequisite for advanced process control. Areas of research include first principle models, data driven models, and model reduction for control and optimization. New trends in this area included the use of hybrid and multilevel models with different levels of refinement. This allows the development of different classes of models for different control applications.

Model based control has become an important and exciting field in the development of advanced control strategies. Areas of current research include linear and nonlinear MPC, linearizations based geometric concepts, etc. New trends in this area include advances in optimization formulations for model predictive control as well as optimization algorithms that are based on differential flatness.

Real-time Optimization has become an essential component in the overall control and supervision of chemical plants. Research topics in this area include optimization of steady state and dynamic models, integration with control systems. New trends in this area include greater awareness and application of optimization in industry as well as more powerful algorithms for dynamic optimization instead of steady state optimization with dynamic regulation.

Process and Control Monitoring is required to gauge the performance of processes and controllers and their interactions with sensors, data historians and control elements. Research topics include principal component analysis (PCA) and other statistical techniques, auditing of

IFAC Control Engineering Textbook Prize Endowed in Honor of Harold Chestnut First President of IFAC

Call for Nominations

The *Control Engineering Textbook* (CETP) Selection Committee calls for nominations for the Triennial CETP. The Prize goes to author(s) of that control engineering textbook judged to have most contributed to the education of control engineers. The nominated book must be written in one of the official IFAC languages, preferably in English, must have been published between September 1, 1993 and July 31, 1999. The prize, consisting of a monetary award and a certificate, will be presented at the 15th IFAC World Congress in Barcelona, 2002.

A nomination letter must include the full title, name(s) and address(es) of the author(s), date of publication, name and address of the publisher as well as copies of book reviews (in IFAC affiliated journals and others).

The CETP selection committee asks for and will take into account any additional information to be submitted with the nomination letter such as letters of support, publisher's data, list of adoptions, etc. Any further information will be appreciated.

Please send the nomination material to the Chair of the Technical Committee on Control Education

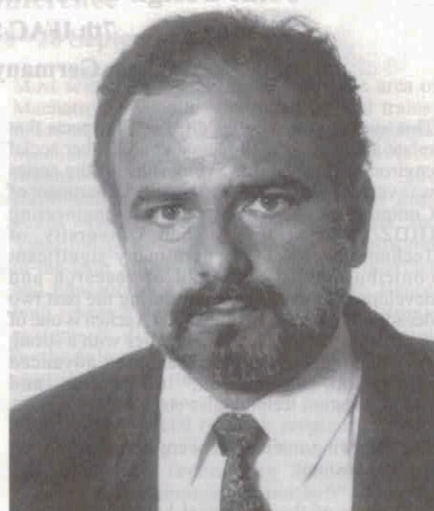
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Your cooperation will be greatly appreciated. Please respond at your earliest convenience.

To be considered, nominations must be received by June 30, 2001 at the latest.

The winner(s) will be notified in due time so that advance plans can be made to attend the award ceremony.

WHO IS WHO IN IFAC



Prof. Annibal Ollero
Member of the Technical Board

Anibal Ollero received his Electrical Engineering degree (1976) and the Doctor Engineer degree (1980) with doctoral award from the University of Seville. He worked in an engineering office and was assistant professor at the University of Seville (1976-1980). Later he was full professor at the Universities of Santiago in Vigo, where he was Director of Department and Vice-Director of the Engineering School, and Malaga (Spain) where he was also Head of Department, and Director of the Engineering School. He has also been "stagiaire" at the Laboratoire d'Automatique et d'Analyse des Systemes (LAAS-CNRS), Toulouse, France (1979), and visiting scientist (1990-1991) at the Robotics Institute, Carnegie Mellon University, Pittsburgh, USA. Since December 1992 he has been Professor at the University of Seville where he is Vice-Director of the Engineering School.

Professor Ollero is the author of two books on computer control and robotics, one of them being "Premio Mundo Electrónico" (Spanish award), editor or coeditor of three Pergamon Press books, and author of more than 200 publications including papers in journals, book chapters, and Conference Proceedings. He has participated in or led 48 research and development projects funded by Spanish agencies, the European Commission (Esprit, Telematics Application Program, Brite, Environment and Climate) and several industries. His research activities are in new methods and technologies for robotics, perception, computer vision and intelligent control, including fuzzy control methods and learning techniques. He has led the design and implementation of prototypes and working systems for several applications including autonomous guidance of vehicles (conventional vehicles and large trucks at high speed), forest fire detection and monitoring, autonomous robotic systems for greenhouse operations, teleoperation of space manipulators, autonomous machines for forestry, and robotic internal pipe inspection.

Professor Ollero is currently the Chairman of the "Manufacturing and Instrumentation" Coordinating Committee of the International Federation of Automatic Control (IFAC), and was Chairman of the IFAC Technical Committee on "Components and Instruments" (1993-1999), and the Working Group on "Intelligent Components and Instruments" (1991-1993). He is Associate Editor of *Control Engineering Practice* and *IEEE Transactions on Systems Man and Cybernetics*. He has been project reviewer for the Spanish National Evaluation Agency and the European Commission, and also collaborates with the "Plan Andaluz de Investigación" (Andalusian Research office) being member of the Information and Communication Technologies Committee.

ctd. from page 7

sensors, etc. Trends in this area include application to larger and more challenging process systems.

Process Identification is essential for understanding process dynamics and developing virtually all control strategies. Research topics covered here include estimation and filtering of linear and nonlinear systems. New trends in this area include the assessment of a general purpose nonlinear models and application to much larger and more challenging process examples. Moreover, there is a much deeper analysis of algorithmic treatment and implementation of identification strategies and the interaction with control systems.

Finally, in Process Control Applications and Plantwide Control, there was a wide variety of submissions that demonstrate process engineering applications of advanced control, including the control of environmental systems, petroleum refineries, etc.

From an overall perspective, the conference addressed issues of interest to all sectors of the process industry such as the petroleum, petrochemical, chemical, specialty chemical, food, pharmaceutical, cement, paper and pulp.

All in all there were 174 presentations, a record increase from the ADCHEM '97 meeting, where about 130 papers were presented, and also a record increase over the DYCORDER '98 meeting, where 157 papers were submitted. The conference had 195 attendees.

Lorenz T. Biegler
IPC Chair, ADCHEM 2000

This Newsletter may be reproduced in whole or in part. We encourage reprinting in national and local automatic control periodicals. Acknowledgement to IFAC would be appreciated.

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