IFAC International Federation of Automatic Control
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1992
No. 3
June

Newsletter

Contents:

3000 IFAC Affiliates
A Progress Report on IFAC Services

The IFAC Affiliate Program is now a little more than one year old - time to take a closer look at it and to evaluate its potential and its benefits.

It can be said without exaggeration that this program may be considered one of the best investments into the present and future of IFAC. The clear beneficiaries of this Program are the National Member Organizations, as organizers of IFAC events. It provides them with a comprehensive database of persons interested in the fields in which they organize meetings. For the Affiliates themselves, the Program allows them easier access to IFAC events, by giving them timely information on IFAC meetings and related events.

The keyword database, which has been established together with the Affiliate Registration, is an important tool for organizers of IFAC sponsored and co-sponsored events. Almost all of them use the services offered, leading to a yearly distribution of more than 20.000 address labels. The keywords most frequently indicated by the Affiliates are: Adaptive Control and Systems (1233 entries); Control Design (1119 entries); Computers in Control (1108 entries). At the bottom of the list we find: Agriculture (94 entries); Marine Control (137 entries); Biotechnology (202 entries). Among other fields of interest that were indicated by Affiliates there was Robotics (6 entries); Discrete Event Systems (3 entries); and Robust Control (3 entries).

Currently there are almost 3.000 individual entries in our database, including persons from the following 72 countries:

AFFILIATES PER COUNTRY

Albania	2
Algeria	3
Arabian Gulf	1
Argentina	16
Armenia	1
Australia	70
Austria	56
Azherbaidzan	5
Bahrain	1
Belgium	35
Bielorussia	9
Brazil	58
Bulgaria	57
Canada	81
Chile	14
China	288
Croatia	2
Czechoslovakia	62
Cuba	5
Denmark	36
Egypt	8
Estonia	12
Finland	42
France	113
Germany	224
Greece	12
Hong Kong	18
Hungary	45
India	18
Indonesia	2
Iran	3
Ireland	5
Israel	18
Italy	107
Japan	109
Kasakhstan	2
Kirgisia	3
Korea, People's Rep.	10
Korea, Rep.	22
Kuwait	4
Latvia	3
Lithuania	11
Malaysia	1
Mexico	23
Morocco	19
Mozambique	1
Netherlands	72
New Zealand	6
Nigeria	4
Norway	18
Pakistan	3
Peru	1
Poland	95
Romania	48
Russia	113
Singapore	22
Slovenia	17
South Africa	32
Spain	38
Sweden	69
Switzerland	35
Taiwan	13
Turkey	23
Turkmenia	1
UK	182
Ukraine	33
USA	401
Uzbekistan	1
Venezuela	6
Vietnam	5
Yugoslavia	26
Zimbabwe	2

MALAGA, MALAGA, MALAGA

This Newsletter is being prepared just as we get ready to go to Malaga for the Council- and Related Meetings. You will learn more about these meetings in our August issue (or later – depending on your holiday schedule).

Technical Committee on Computers

The TC on Computers concentrates on studying, discussing and solving problems invoked by applying computers for monitoring and controlling technical and social systems. COMPUT is not an application committee, it tries to abstract, formulate and answer key questions related to all the above computer applications. So, rooted firmly in the industry and applications, we study abstract problems - e.g. matching the dynamic behaviour of the application with that of the computer system by using the concept of time (hence real-time systems).

Formally the scope of the Committee is as follows:
The Computer Committee is concerned with the design and utilization of real-time computer systems in the control of continuous and discrete processes. Current areas of interest include software engineering, management of software projects, safety and reliability, systems architecture, distributed computer control systems, inter-computer communications, database management and the use of artificial intelligence methodologies.
Recognizing that computers are all pervasive in control, the Committee maintains strong links with other IFAC Committees and also acts as a bridge to IFIP and similar bodies.

To emphasize its particular interests in certain areas, COMPUT has formed five working groups which concentrate their activities around annual workshops:
- Artificial Intelligence in Real-Time Control (Chairman G. Suski, USA)
- Distributed Computer Control Systems (Chairman A. Inamoto, Japan)
- Distributed Real-Time Databases (Chairman E. Knuth, Hungary)
- Management of Software Projects (Chairman P. Elzer, Germany)
- Real-Time Programming (Chairman J. de la Puente, Spain)

In addition to the listed WGs, COMPUT has a joint working group with MANTECH – on Control Architectures for Integrating Manufacturing Activities and Enterprises (Chairman T. Williams, USA)
A working group on Guidelines and Specifications of Software for Computer Aided Control Systems Design (Chairman M. Rimval) aimed at developing recommendations for standards in this field. This WG achieved promising results during three years (1987-90). It was discontinued due to many objective and subjective problems connected with activities in the guidelines and standard area. Prof. Maciejowski is studying the feasibility of resuming the activities of this working group.

In 1992 COMPUT sponsors the following events: Experience with the Management of Software Projects (May 18-19), Artificial Intelligence in Real-Time Control (June 16-18), Real Time Programming (June 23-26), Distributed Computer Control Systems (Aug. 23-25), Algorithms and Architecture for Real-Time Control (Aug. 31-Sept. 2), SAFECOMP 92 (Oct. 28-29); in addition, COMPUT acts as co-sponsor for 6 further IFAC events in 1992.

Currently COMPUT has 104 members, representing 39 countries. COMPUT is managed by a team of five – Chairman L. Motus (Estonia) and four Vice-Chairmen – P. Elzer (Germany), H.T. Li (China, P.R.), J. de la Puente (Spain), G.J. Suski (USA).

Informal Meeting of the IFAC Officers

Laxenburg, Austria

April 9 – 11, 1992

From left to right: M. Thoma, Y.Z. Lu, S. Kahne, M. Mansour, G. Hencsey, L. Ljung, B. Tamm, B.D.O. Anderson, M. Dawes, W. Schaufelberger

The 13th Informal Meeting of the IFAC Officers was held in Laxenburg at the IFAC Secretariat.

B.D.O. Anderson, B. Tamm, S. Kahne, L. Ljung, Y.Z. Lu, M. Mansour, W. Schaufelberger and G. Hencsey, among others, informally discussed matters relating to the changes that have recently taken place in Europe. These changes will most certainly lead to new applications for membership in IFAC by the newly independent states. Several such applications have already been made or it has been announced that such applications will be forthcoming. There was agreement that this new political situation in Europe will also benefit the automatic control community in general.

Special attention was also given to the IFAC relations with regional conferences. So far, relations have been established with the American Control Conference and the European Control Conference. A similar contract is ready for signing with the Latin American Control Conference and negotiations are under way with the Asian Control Conference.

Ample time was again devoted to technical matters, this being at the core of IFAC and the actual purpose of the Federation. The possibility of restructuring the Technical Board to install a flatter structure was discussed.

The informal structure of this meeting also made it possible to have a comprehensive discussion on publications matters. For this purpose, M. Dawes of IFAC Publications, Pergamon Press, and M. Thoma, Chairman of the Publications Managing Board and IFAC Advisor, joined the meeting on Friday morning. Apart from all these considerations, the IFAC Presidents also used the opportunity to take a close look at the operation of the Secretariat.

Outside the meeting schedule, the Presidents met with representatives of Austria's scientific community, of the Academy of Sciences, the Austrian NMO, the IFAC Beirat and representatives of the Austrian Federal Ministry of Science and Research.

Dr. Ing. Gerhart Ruppel 1902 – 1992

Gerhart Ruppel, one of IFAC's founding fathers died in April 1992, at the age of 90 years.

Dr. Ruppel was involved in the creation of the Federation as of its conception in 1956, when a group of enthusiasts met in Heidelberg to discuss the possibility of founding an international body of automatic control. As a consequence, IFAC was founded in Paris, one year later. From its very start, Dr. Ruppel was Secretary of the Federation until 1972. He was then appointed Advisor of IFAC. Dr. Ruppel did not only essentially shape the Federation in his active time, but was always ready to give his invaluable input and advice.

We shall all remember Dr. Ruppel as a warm-hearted man, full of humour, always ready to help in word and deed. IFAC will keep him in fond memory.

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Control of Power Plants and Power Systems

IFAC Symposium

Munich, Germany, 9 – 11 March, 1992

The IFAC (International Federation of Automatic Control) Symposium on Control of Power Plants and Power Systems took place in Munich, Germany from 9 – 11 March, 1992.

Of the more than 200 detailed abstracts submitted, 107 could be accepted after review by the International Program Committee. 93 papers were submitted as full papers and included into the two Proceedings volumes. It is regrettable, however, that five contributions from Eastern Europe and ten from China, P.R. could not be presented and discussed, as the authors did not come to Munich.

In spite of the currently unfavourable economic conditions in Eastern Europe and probably also the political restrictions for travel in China, attendance at the Symposium can be considered very good with 280 participants from 23 countries.

The Gasteig Centre was the ideal setting for the Symposium. The participants did not even have to leave the centre for meals and thus there were many opportunities for personal encounters and exchanges of opinion. At the same time all this also made for good attendance at the afternoon sessions.

The special technical feature at this Symposium was the possibility of having a first opportunity to discuss the problem areas of the otherwise sometimes competing energy technology sectors 'power plant' and 'network' with the same intensity and in addition also under consideration of the overlaps.

Three plenary papers were given, i.e.:

- Constrained Control Concepts in Power Plants and Power Systems for Avoiding Emergency Conditions, by E. Welfonder;
- Issues in Modelling and Simulation of Power Plants, by C. Maffezoni; and
- Evaluation of the Operation of the Interconnected West European Grid, by I.P. Waha.

In addition, a round table discussion on the subject 'Introduction of Expert Systems and Fuzzy Logic into the Operation Environment of Power Plants and Power Systems' was organized. The basic issues discussed were: Experience, problems, functionality, etc. The discussion was chaired by P. van Son and the six panelists, among others, made the following statements:

- Expert systems, fuzzy logic and neuronal nets offer interesting and new possibilities for finding solutions in the power plant- and network area;
- so far there are too few practical applications;
- the economic advantages should be particularly stressed;
- close cooperation between research (universities) and industry (public utilities) is required.

Focus of the Symposium were the 21 expert sessions on the following subject areas, with three sessions respectively taking place in parallel:

Power Plant Control

- Realtime Aspects of Power Plant Operation
- Modelling and Simulation of Power Plants
- Control of Combined Cycle Units
- Control of Co-Generation Plants
- Strategies for Activation of Stored Energy
- State Estimation; Fault Analysis: Diagnosis
- Application of Artificial Intelligence Methods
- Advanced Control Schemes
- Special Control Problems
- Tools for Control System Design and Documentation

Power System Control

- Flow Calculations in Networks
- Load Forecasting
- Voltage and Reactive Power Scheduling and Control
- Experience and New Developments in State Estimation and Model Reduction
- Generation Scheduling and Control
- Power System Control Center Functions
- Analysis of System Generator Faults
- Expert Systems Applied to Power System Problems
- Dynamic Security Analysis
- Stability Enhancement and Control
- Distribution Networks and DC Transmission

Of the 79 papers presented, about 25 % reported on practical applications, 45 dealt with modelling or technical simulation studies and 30 % had a largely theoretical bias.

Of the 40 contributions in the area of Power Plant Control, 25 % directly dealt with power plants, the others considered related areas, such as district heat decoupling, gas turbines, energy management, etc.

All in all the conclusion can be drawn that modelling and simulation are gaining increasing influence. This is particularly characterized by the increased supply of modular, standardized software packages for CAE use in the power plant sector.

Modern methods in the control field are also increasingly applied for the design of state controllers, prediction-supported controllers, optimum output controllers as well as of H_∞ controllers. Further, many contributions stressed the ever growing significance of the man-machine interface, as well as comprehensive design- and specification tools.

The contributions in the area Power System Control showed that the methods of net calculation- and analysis as well as the practical application of the results thus achieved have reached a very high standard indeed.

Thus, for instance, the combination of the two areas 'network analysis' and 'expert systems' leads to new tools for analyzing networks. As a consequence, the number of case studies to be implemented for each individual case to be investigated can be decisively reduced.

It has further turned out that the practical application of previously theoretically determined optimum load flow strategies in real networks can lead to a marked reduction of network transmission losses.

Another field in the centre of attention was the one of "restoration after blackouts". Here simulation techniques could be used to examine existing restoration strategies for individual partial nets, and valuable information could be given on limitations and framework conditions.

It may be expected that in the future modern computer supported methods will also be increasingly used in the area of network management and control.

In general and also according to the statements of many participants, the IFAC Symposium, which was for the first time held in Germany, can be considered a very successful event.

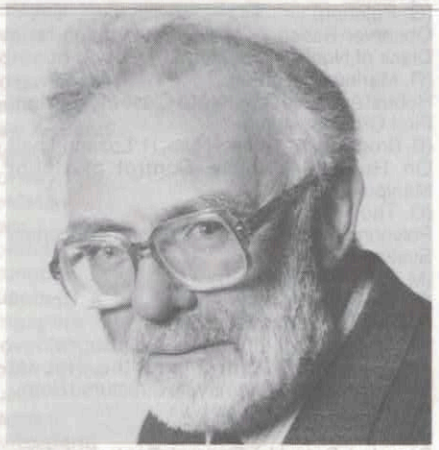
The next IFAC Symposium on the Control of Power Plants and Power Systems in the three-year cycle of this event, is planned for Mexico City in 1995.

The development of the program for this Symposium will again be in the hands of the respective IFAC Working Group.

Prof. Welfonder
Chairman of the Working Group and of the Munich Symposium

News from Sister Federations

New IFORS President



Brian Haley
IFORS President

Brian Haley has been Professor of Operational Research in the University of Birmingham since 1968, having entered O.R. in 1954 and working for a number of organizations in England including the National Coal Board, Procter&Gamble and I.C.I. (Metals) before becoming the first lecturer in O.R. in 1959 on the pioneering Masters Programme. Within the profession he has held many offices including President of the O.R. Society and the Editor of the O.R.Q. being responsible for the change to a monthly journal. He has been the chairman of the EURO conference and within IFORS was one of the first contributing editors of IFORS in 1961 and has edited the Conference Proceedings in both Japan and Canada. More recently he was Vice-President from 1983 – 85, chairman of the Publications Committee 1986 – 88 and became President in 1992.

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The Journal of IFAC the International Federation of Automatic Control

Papers from the Next Issue – July 1992

Papers

Nonlinear Control Design for Slightly Non-Minimum Phase Systems: Application to V/STOL Aircraft
(J. Hauser, S. Sastry, G. Meyer)
Controlling Nonlinear Time-Varying Systems via Euler Approximations
(I.M.Y. Mareels, H.B. Penfold, R.J. Evans)
Multivariable Continuous-Time Generalized Predictive Control (MCGPC)
(H. Demircioglu, P.J. Gawthrop)
Adaptive Robust Control of Uncertain Systems with Measurement Noise
(Y.H. Chen)
Motion and Force Control of Multiple Robotic Manipulators
(J.T. Wen, K. Kreutz-Delgado)
Stabilization of Rigid Body Dynamics by Internal and External Torques
(A.M. Block, P.S. Krishnaprasad, J.E. Marsden, G. Sánchez de Alvarez)
LQ-Optimal Control of Infinite-Dimensional Systems by Spectral Factorization
(F.M. Callier, A. Swami)

Brief Papers

Adaptive Control of Wiener Type Nonlinear Systems
(G. Pajunen)
Observer-Based Adaptive Stabilization for a Class of Nonlinear Systems
(R. Marino, P. Tomei)
Robust Adaptive Control of a Class of Nonlinear First Order Systems
(B. Brogliato, A. Trofino-Neto, R. Lozano-Leal)
On Robust Adaptive Control of Robot Manipulators
(G. Tao)
Polynomial Robust Control Design for Uncertain Systems
(M.C. Han, Y.H. Chen)
On Robust Stability Analysis of a Control System Using Laguerre Series
(D. Agamennoni, E. Paolini, A. Desages)
Time-Varying Control and the Robust Performance of Systems with Structured Norm-Bounded Perturbations
(M. Khammash, M. Dahleh)
Sampled Data H∞ Optimal Control of Time Varying Systems
(H.T. Toivonen)
Stability and Performance in the Presence of Magnitude Bounded Real Uncertainty: Riccati Equation Based State Space Approaches
(D. Obradovic, L. Valavani)
Identification of Partially-Known Systems
(P.J. Gawthrop, R.W. Jones, S.A. MacKenzie)
A Computationally Efficient Numerical Algorithm for the Minimum Time Control Problem of Continuous Systems
(T.S. Chung, C-J. Wu)

Book Reviews

Automatic Flight Control Systems; Series in Systems & Control Engineering by D. McLean
(R. Brockhaus)
Feedback Control of Dynamic Systems by G. Franklin, J.D. Powell, A. Emani-Naeini
(T. Shachua)
Nonlinear Systems, Vol 1: Dynamics and Control; Vol. 2: Bilinear Control by R.R. Mohler
(H. Kanoh)

Technical Committee on Automotive Control

A little over a year ago, one of the Council members, Jürgen Ackermann, undertook a study of the need for IFAC to expand its activities in the area of automotive control. He contacted many individuals and groups, including leading car manufacturers in Europe, the USA and Japan, and Societies rather like IFAC with a specific interest in motor vehicles. Information was sought as to whether these individuals and bodies thought it would be desirable for IFAC to expand its activities in automotive control. The response was overwhelmingly in favour of a development. The Council authorized the setting up of a Technical Committee on Automotive Control at its Swansea meeting, subject to the identification of a Chairman of the Committee and a suitable scope. Dr. William F. Powers of the Ford Motor Company has agreed to serve as the Chairman. The Council has very high hopes for this Technical Committee. If there is anyone within your National Member Organization who would be particularly interested in becoming associated with the Committee, contact should be made with the IFAC Secretariat. (The Secretariat wrote to NMOs on October 31, 1991, along these lines).

The automotive business is probably the most globally competitive business in the world today. It is also complex, important with respect to global economics and thoroughly integrated in the everyday lives of most citizens. With the microelectric revolution, automobiles are becoming a strong blend of electronic and mechanical systems. A great deal of research is involved with automobiles, not only in the automotive companies but also in universities and consortia worldwide. Control engineering has played and will continue to play a strong role in the development of future automotive systems.

The following draft scope for the Technical Committee has been submitted to IFAC for review:

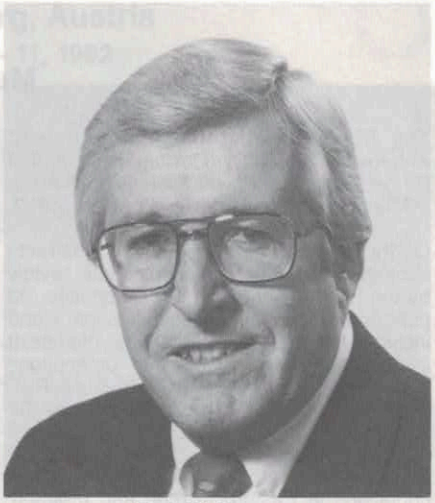
The Automotive Control Committee is concerned with and involved in the application of automatic control and systems engineering principles to automotive vehicles. Key application areas include total vehicle emissions, safety, function, fuel economy, reliability, and societal infrastructure interactions. Technologies associated with power train modelling and control, chassis systems modelling and control, total vehicle interactive control, on-board/service diagnostic systems, on-board communications and multiplexing, and intelligent vehicle highway systems will be employed to attack problems in the key application areas. The Committee is not concerned with automotive manufacturing control except when it interfaces strongly with on-board computer, control, and/or communication systems.

The Technical Committee is currently in the process of forming technical subgroups in emerging automotive control technologies. The Committee will develop at least two major sessions for the 1993 Congress. If you wish to be informed of the Committee's activities, or have ideas for actions by the committee, please send your ideas to Dr. Powers:

e-mail: wpowers@smail.srl.ford.com
fax: 313/845-3568
phone: 313/337-5566
mail: Ford Motor Company
Scientific Research Laboratory
PO Box 1603, Room S-2047
Dearborn, MI 48121-1603, USA

Also of possible interest to those involved in automotive control is the IAVSD Workshop of R&D Issues in Automotive Integrated Chassis Control Systems, July 1-3, 1992, in Hebertov, Czechoslovakia. Please contact Prof. J. Karl Hedrick, Professor and Vice-Chair Graduate Study, Department of Mechanical Engineering, University of California, 6141 Etcheverry Hall, Berkeley, CA 94720, USA.

WHO IS WHO IN IFAC



Prof. W. Powers.
Chairman of TC on Automotive Control

William F. Powers has been with the Ford Motor Company since 1979. He is the Executive Director, Research Staff, a position to which he was appointed in February 1991. Formerly, he served as Program Manager, Car Product Development Specialty Car Programs, Director of Product and Manufacturing Systems, and Director of the Powertrain and Systems Research Laboratory. Mr. Powers received his B.S. in Aerospace Engineering in 1963 from the University of Florida, and his Ph.D. in Engineering Mechanics in 1968 from the University of Texas at Austin. At NASA Marshal Space Flight Center from 1960-65, he was involved with the development of the Saturn Booster guidance system and Apollo mission analyses. He consulted on the Space Shuttle Program with the NASA Johnson Space Center during the period 1970-79. From 1968-1980, Mr. Powers was a Professor of Aerospace Engineering at the University of Michigan. He has served as Editor of the Journal of the Astronautical Sciences and Associate Editor of the AIAA Journal of Spacecraft and Rockets, Journal of Optimization Theory and Applications, Optimal Control Applications and Methods, IEEE Transactions on Automatic Control, and Control Systems Magazine, and is a fellow of IEEE. He also served as President of the American Automatic Control Council (1988-89) and Chairman of the National Science Foundation Advisory Council for Electrical, Communication and Systems Engineering (1988-89) He currently is a member of the Engineering Visiting Committees of the University of Illinois and Purdue University. Professor Powers was appointed chairman of the newly established IFAC Technical Committee on Automotive Control in 1991.

IFAC

FORTHCOMING EVENTS

1992
No. 3
June

Title	1992	Place	Deadline	Further Information
IFAC Workshop Artificial Intelligence in Real-Time Control	June 16–18	Delft Netherlands	-	AIRTC 92 Secretariat, c/o KIVI POB 30424, NL-2500 GK The Hague Netherlands
IFAC Workshop Real-Time Programming	June 23–25	Bruges Belgium	-	Mr. Luk Pauwels, Coordinator, BIRA Desguinlei 214, B-2018 Antwerp, Belgium
1992 American Control Conference in cooperation with IFAC	June 24–26	Chicago, IL USA	-	Mr. D. E. Seborg, Dept. of Chem.&Nucl. Engg., Univ. of California Santa Barbara, CA 93106, USA
IFAC Symposium Nonlinear Control Systems Design NOLCOS	June 24–26	Bordeaux France	-	Dr. M. Fliess, CNRS, Lab. des Signaux et Systèmes, Plateau de Moulon F-91112 Gyf sur Yvette, France
IFAC/(IFORS) Workshop Support Systems for Decision and Negotiation Processes	June 24–26	Warsaw Poland	-	Dr. Z. Nahorski, DNS Secretariat Polish Academy of Sciences Newelska 6, PL-01 447 Warsaw, Poland
IFAC Symposium Adaptive Control and Signal Processing	July 1–3	Grenoble France	-	Dr. L. Dugard, ACASP 92 GR Automatique, ENSIEG, BP 46 F-38402 St. Martin d'Hérès, France
IFAC Workshop Economic Time Series Analysis and System Identification	July 1–3	Vienna Austria	-	ÖPWZ, ESI Workshop Rockhgasse 6 A-1014 Vienna, Austria
ISDG/IFAC Int. Symposium Dynamic Games and Applications	July 15–16	Geneva Switzerland	-	Mr. A. Haurie, Dept. de Economie Commerciale et Industrielle Univ. de Geneve, 2, rue de Candolle CH-1211 Geneva, Switzerland
IEEE/IFAC Workshop Emerging Technologies and Factory Automation	August 12–14	Melbourne Australia	-	Dr. R. Zurawski, Lab. f. Concurrent Computing Systems, School of E & Comp. Engg., Swinburne School of Technology, POB 218 Hawthorne 3122, Australia
IFAC Workshop Expert Systems in Agriculture	August 12–14	Hefei China, P.R.	-	Prof. Fan-Lun Xong, AES 92 Secretariat, POB 1130, Hefei 230031, Anhui, China, P.R.
IFAC/IFORS/IFIP/IIASA Symp. Modelling and Control of National Economies	August 18–20	Beijing China, P.R.	-	Ms. Wang Hong, MCNE 92 Secretariat Chinese Association of Automation POB 2728, Beijing 10080, China, P.R.
IFAC/IFORS Symposium (6th) Large Scale Systems: Theory and Applications	August 22–25	Beijing China, P.R.	-	Prof. Y.P. Zhang, IFAC LSS92 Chinese Association of Automation POB 2728, Beijing 100080, China, P.R.
IFAC Workshop (11th) Distributed Computer Control Systems - DCCS 92	August 23–25	Beijing China, P.R.	-	Ms. Wang Hong, IFAC DCCS 92 Chinese Association of Automation POB 2728, Beijing 100080, China, P.R.
IFAC Symposium (7th) Automation in Mining, Mineral and Metal Processing	August 26–28	Beijing China, P.R.	-	Mr. Cheng Wei-Zhi, MMM 92 Secretariat ARIM Information Section, POB 919 100071 Beijing, China, P.R.
IFAC Workshop Algorithms and Architecture for Real Time Control	August 31 Sept. 2	Seoul Korea	-	IFAC AARTC Workshop Secretariat Engg. Research Center for Advanced Control & Instrumentation, Bldg 133 Seoul National University Seoul 151-742, Korea
IFAC Workshop Mutual Impact of Computing Power and Control Theory	Sept. 1–2	Prague CSFR	-	Dr. M. Karny, Inst. of Information Theory& Automation,Pod vodarenskou vezi 4 CS-182 08 Prague, CSFR
IFAC Workshop Control Applications of Optimization	Sept. 2–4	Munich Germany	-	Prof. D. Kraft, FH München FB Machinenbau&Fahrzeugtechnik Dachauerstr. 98b, D-8000 München 2 Germany
IFAC Workshop (2nd) System Structure and Control	Sept. 3–5	Prague CSFR	-	2nd IFAC WS, Institute of Information Theory&Automation, POB 18 CS-182 08 Prague, CSFR
IFAC Workshop Interactions between Process Design and Process Control	Sept. 6–8	London UK	-	Ms. S. Topley, Centre for Process Systems Engg, ICSTM, Prince Consort Road, London SW7 2AZ, UK
IFAC Workshop Cost Effective Use of Computer Aided Technologies	Sept. 7–8	Vienna Austria	31 May 1992	ÖPWZ, Att. Ms. Hähnel Rockhgasse 6, A-1014 Vienna, Austria

FORTHCOMING EVENTS (ctd.)

Title	1992	Place	Deadline	Further Information
IFAC/IAF Symposium Automatic Control in Aerospace	Sept. 7–11	Munich Germany	-	Dr. Ing. E. Gottzein, c/o MBB POB 801169, D-8000 München 80 Germany
IFAC Symposium (3rd) Low Cost Automation - LCA 92	Sept. 9–11	Vienna Austria	-	Prof. P. Kopacek, c/o ÖPWZ Rockhgasse 6, A-1014 Vienna, Austria
IFAC/IFORS Workshop Spacecraft Automation and On-Board Autonomous Mission Control	Sept. 14–16	Darmstadt Germany	-	Mr. W. Wimmer, c/o ESOC Robert Bosch Str. 5 D-6100 Darmstadt, Germany
IFAC/IFORS Workshop Supplemental Ways for Improving International Stability - SWIIS	Sept. 21–24	Toronto area Canada	-	Prof. J. O'Shea, Ecole Polytechnique CP 6079, Succ. „A" Montreal, QUE H3C 3A7, Canada
IFAC Symposium Automated Systems Based on Human Skill (and Intelligence)	Sept. 23–25	Madison, WI USA	-	School of Workers - UWEX, 422 Lowell Hall, 610 Langdon St., Madison, WI 53703, USA
CPPA/IFAC Conference Control Systems '92 - Dreams vs Reality, Modern Process Control in the Pulp and Paper Industry	Sept.28 Oct. 1	Whistler, BC Canada	-	Prof. J. O'Shea, Ecole Polytechnique CP 6079, Succ. „A" Montreal, QUE H3C 3A7, Canada
IFAC Workshop Intelligent Manufacturing Systems	Oct. 1–2	Dearborn, MI USA	-	Prof. N. A. Kheir, El. & Systems Oakland University Rochester, MI 48309-4401, USA
IFAC/IMACS/IUTAM/IEEE Workshop Motion Control for Intelligent Automation	Oct. 28–29	Perugia Italy	-	Prof. A. DeCarli, Dept. of Comp. & Systems Science, Univ. of Rome 'La Sapienza'. Via Eudossiana 18 I-100184 Rome, Italy
IFAC Conference SAFECOMP '92	Oct. 28–30	Zurich Switzerland	-	Dr. H. Frey, ABB Transportation Syst. Ltd, B-T, Affolternstr. 52 CH-8050 Zurich, Switzerland
IEEE/MBS/IFAC Conference 14th Annual Intl. Conference of the IEEE, Engg. in Medicine and Biology Society	Oct. 29 Nov.1	Paris France	-	Dr. Swami Laxminarayan Academic Computing Center, IST Univ. of Medicine and Dentistry 185 S. Orange Ave Newark, NJ 07103, USA
IFAC Workshop Trends in Hydraulic and Pneumatic Components and Systems	Nov. 11–13	Anaheim, CA USA	*	Dr. D. Wormley, Dept. of Mech. Engg. MIT, Cambridge, MA 02139, USA
IFAC Workshop CIM in Process and Manufacturing	Nov. 23–25	Helsinki Finland	*	Prof. K. Leiviskä, Univ. of Oulu Dept. of Process Engineering SF-90470 Oulu, Finland
IFAC/IFORS Workshop Man-Environment: The Challenging Relationship	Dec. 9–11	Lisbon Portugal	May 92	Prof. R. Campos Guimaraes APDIO-CESUR-IST Av. Rovisco Pais P-1000 Lisbon, Portugal

Title	1993	Place	Deadline	Further Information
IFAC Workshop Production Control in the Process Industry	March 29–31	Düsseldorf Germany	30 June 1992	VDI/VDE-GMA, PCPI 93 POB 101139, Graf Recke Str. 84 D-4000 Düsseldorf 1, Germany
IEEE/IPJS/SICE/IFAC Symp. Autonomous Decentralized Systems-ISADS	March 30 April 1	Kawasaki Japan	1 July 1992	Dr. K. Mori, ISADS Secretary Systems Development Lab. Hitachi Ltd, 1099 Ohzenji, Asao Kawasaki 215, Japan
IFAC Workshop Intelligent Autonomous Vehicles	April 18–21	Southampton UK	25 Sept. 1992	Prof. C. J. Harris, Dept. of Aero & Astro. Highfield, Univ. of Southampton Southampton SO9 5NH, UK
1993 American Control Conference in cooperation with IFAC	June 2–4	San Francisco USA	15 August 1992	Prof. A. Haddad, AACC Secretariat Dept. of EECS, Northwestern Univ. 2145 Sheridan Road, Evanston, IL 60208-3118, USA
1993 European Control Conference in cooperation with IFAC ECC'93	June 28 July 1	Groningen Netherlands	1 Oct. 1992	ECC '93 Secretariat, c/o J. W. Nieuwenhuis Faculty of Economics, POB 800 NL-9700 AV Groningen, Netherlands
IFAC WORLD CONGRESS	**JULY 19–23**	**SYDNEY AUSTRALIA**	**31 July 1992**	**IFAC Congress Secretariat '93 Dept. of El. & Computer Engg. Univ. of Newcastle, University Drive Callaghan, NSW 2308, Australia**
IFAC/IEEE/ACM Workshop AI in Economics and Management	August 25–27	Portland, OR USA	*	Prof. Kuan-Pin Lim, Dept. of EC, Portland State University, POB 751 Portland, OR 97292, USA

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