IFAC International Federation of Automatic Control
Secretariat: Schlossplatz 12, A-2361 Laxenburg, Austria – Phone (02236) 71 4 47, Fax (02236) 72 8 59, Telex 79248 ifac a

1990
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Newsletter

Contents:

UNFORGETTABLE DAYS IN TALLINN

11TH IFAC WORLD CONGRESS

Tallinn, USSR, 13 - 17 August, 1990

Dr. A. Rüütel
Chairman of the Estonian Supreme Council

The 11th Triennial World Congress of IFAC was opened by the Chairman of the Estonian Supreme Council, Dr. A. Rüütel on August 13, 1990. The President welcomed the IFAC guests of the Estonian capital. In his opening address he stated: ".....An intellectual potential of a nation, a data bank as well as knowledge and skills to use it are regarded as the quality of today. Your organization is of considerable significance along those lines.....The Estonian Parliament and Government are greatly honoured by the decision of IFAC to hold its 11th Congress in Tallinn."

Further words of welcome were spoken by Prof. Vadim Utkin, as representative of the USSR National Committee of Automatic Control, the USSR NMO of IFAC.

Acad. Boris Tamm, President of IFAC, then took the floor and welcomed the participants of the Congress. He proceeded to present the Automatica Paper Prize winners with their awards (cf. page 5) and to appoint Prof. Manfred Thoma life-time advisor of IFAC.

After the presentation of awards, Acad. Ülo Jaaksoo, Co-Chairman of the International Program Committee gave the keynote address.

The Congress days that followed, their scientific merit and their highlights will be described on the further pages of this Newsletter as well as in the forthcoming issues.

From the organizational point of view it must and should be said at this point that our Tallinn organizers did a marvellous job. Both the technical program and the social activities were extremely well organized. The Estonian hosts did not only establish the ideal conditions for the Congress but helped participants to solve all their problems with unending readiness to be at their guests' disposal.

In his closing address, Prof. Brian D.O. Anderson, the incoming President of IFAC thanked the Tallinn organizers for what they had achieved and stressed at the same time that the Congress in Tallinn would be the yardstick against which the next Congress in Sydney would be measured. This, he said, would by no means be easy for the Sydney organizers.

The participants of the Congress then thanked their hosts by giving them a standing ovation.

Our hosts in Tallinn at the Closing Ceremony

IFAC General Assembly

Tallinn, USSR, 14 August, 1990

As is stipulated in the IFAC Constitution, the Federation held its statutory General Assembly in Tallinn, Toompea Castle, the seat of the Estonian Supreme Council. The representatives of the National Member Organizations were well aware of the significance of convening their General Assembly in such a historical place.

In his address to the General Assembly Boris Tamm, the President of IFAC, took the opportunity to welcome three new institutions as National Member Organizations into the Federation.

The President then reported that, unfortunately, one National Member Organization, i.e. the IEEE Nigeria Section had not paid its membership fee throughout the years of its membership in IFAC. According to Section 2, Article 7b of the Constitution, the National Member Organizations were therefore requested by the IFAC Council to terminate the membership of the IEEE Nigeria section. Thus, by vote of the General Assembly, the membership of the IEEE Nigeria Section was terminated as of the date of the General Assembly. The President also informed the General Assembly that two other National Member Organizations were in arrears with their membership fees and asked the General Assembly to vote in favour of termination of their membership by end of this year should the fees due not be paid. This vote was taken and the President as well as representatives of the General Assembly stressed that they would do everything in their power to prevent termination of membership from occurring.

The President then addressed the item "Membership Fees". National Member Organizations had been informed well in advance of the meeting that an increase of the member-ship fees was necessary. This in particular in view of the fact that fees had not been increased since 1984. To be able to keep the finances of the Federation in good shape also in the time to come, a fee increase was proposed to enter into force as of 1991, corresponding to an annualized increase of 2.5 %.
A unanimous vote was cast in favour of the new officers and Council members. The slate of candidates had been proposed by the Elections Committee for the 1990 - 1993 period. A list of the newly elected officers and Council members is given on this page.The newly elected President, Brian D.O. Anderson, briefly addressed the General Assembly, outlining his plans for the forthcoming triennium. He stressed the importance of the quality of technical meetings with, at the same time, reasonably low registration fees. He pointed to publications, which are one of the major pillars of IFAC's reputation and income. He thanked the NMOs for voting for the fee increase which would help IFAC keep its finances in good shape. Addressing the newly introduced Affiliate Program, Prof. Anderson stressed that this program provided individuals with a better access to IFAC, thus improving also the visibility of the Federation, without having any influence on the legal form of representation in IFAC through National Member Organizations. Further matters to be taken into consideration in the forthcoming triennium are the situation of developing countries and several other challenges of the future such as e.g. the development of communications over the next 10 years, the response to political and social changes, the solution of environmental problems, etc. In this context, the input made by the National Member Organizations will be very valuable indeed.

New Officers 1990 - 1993

COUNCIL		
President	Brian D.O. Anderson	(AUS)
President-Elect	Stephen Kahne	(USA)
Vice President (Technical Board)	Lennart Ljung	(S)
Vice President (Executive Board)	Yong Zai Lu	(PRC)
Immediate Past President	Boris Tamm	(USSR)
Treasurer	Mohamed Mansour	(CH)
Ordinary Members	Jürgen Ackermann	(FRG)
	Derek Atherton	(UK)
	Achiel van Cauwenberghe	(B)
	Edward J. Davison	(CDA)
	Atsunobu Ichikawa	(J)
	Vladimir Kucera	(CSFR)
	Peer Martin Larsen	(DK)
	André Titli	(F)
	J.D.Naude van Wyk	(ZA)
Secretary	Gusztáv Hencsey	(H)
TECHNICAL BOARD		
Chairman	Lennart Ljung	(S)
Vice-Chairmen	Edward J. Davison	(CDA)
	László Keviczky	(H)
	Peer Martin Larsen	(DK)
	Michael G. Rodd	(UK)
	Paavo Uronen	(SF)
Members	Chairmen of Technical Committees (will be introduced in the next issue)	
EXECUTIVE BOARD		
Chairman	Yong Zai Lu	(PRC)
Ex officio (Imm. Past President)	Boris Tamm	(USSR)
Ex officio (Treasurer)	Mohamed Mansour	(CH)
Ex officio (Secretary)	Gusztáv Hencsey	(H)
Ex officio (Chairman Adm.&Finance C.)	Stephen Kahne	(USA)
Ex officio (Chairman Awards C.)	Vladimir Kucera	(CSFR)

Transfer of Presidency from Boris Tamm to Brian D.O. Anderson

IFAC Awards

GIORGIO QUAZZA MEDAL

The IFAC Council, upon the recommendation of the Giorgio Quazza Selection Committee, awarded

Professor Petar Kokotovic

with the 1990 Giorgio Quazza Medal.

The Giorgio Quazza Medal is an IFAC Award to distinguished control engineers, presented at each IFAC Triennial International World Congress as a memorial to the late Giorgio Quazza, a leading Italian electrical and control engineer who served IFAC in many capacities in a most distinguished manner.

Medal winners have been:
- 1981 Prof. John F. Coales
- 1984 Prof. Iakov Z. Tsypkin
- 1987 Prof. Karl J. Åström

AUTOMATICA PRIZE PAPER AWARD

The Prizes are given for outstanding contributions to the theory and/or practice of control engineering or control science, documented by a paper published in the IFAC Journal Automatica. The finances for the Prizes are provided by the Publishers of Automatica, Pergamon Press.
The following three papers were awarded prizes.
V. KUCERA and P. ZAGALAK
"Fundamental Theorem of State Feedback for Singular Systems"
Automatica Vol. 24, No. 5
The paper gives a complete characterization of all proper systems that can be obtained by state feedback from a singular system. The paper extends results by Rosenbrock on pole placement by state feedback to singular systems. Such systems are natural models in many applications.
I. HOSHINO, Y. MAEKAWA, T. FUJIMOTO, H. KIMURA and H. KIMURA
"Observer-based Multivariable Control of the Aluminum Cold Tandem Mill"
Automatica Vol. 24, No. 6
This paper describes all essential aspects of a control system design: mathematical modeling, validation of linearized model, synthesis of control system, simulation and practical implementation. The paper also explains how Wonham´s geometric theory can be applied and how it leads to a control systems structure.
B.R. BARMISH and Z. SHI
"Robust Stability of Perturbed Systems with Time Delays"
Automatica Vol. 25, No. 3
This paper develops a new technique to analyze the stability of systems with time delays and uncertain parameters. It gives a nice extension of Karitonov´s theory. The results are easy to apply to practical problems.

The Selection Committe decided to give honourable mention citations to the following papers:
D. Downing and W. Bryant, Flight Test of a Digital Controller Used in a Helicopter Autoland System. Automatica, Vol 23, No 3.
I.M.Y. Mareels and R.R. Bitmead, Nonlinear Dynamics in Adaptive Control: Periodic and Chaotic Stabilization - II. Analysis. Automatica VOL. 24, No 4.

APPLICATIONS PAPER PRIZE

Following a decision of the IFAC Techncial Board, the 1990 Applications Paper Prize Winners were selected from the best papers in the following subject areas:

Application of Artificial Intelligence Techniques to Real-Time Control/Supervision
Automation in Manufacturing

Finalists were determined from the written papers and the winners from both the written paper and the Congress presentation.

A total of 56 papers was presented in these subject areas (out of 131 papers submitted to the Congress IPC). The prize has been awarded to the authors of the following two papers:
"Asymptotically Reliable Serial Production Lines: Analysis, Synthesis and a Case Study" (subject area 9.1)
by S.M. MEERKOV and F.TOP (presented by S.M. Meerkov, Dept. of Electrical Engineering and Computer Science, The University of Michigan, Ann Arbor, MI, USA)
In recognition of a proposal of a model for an important class of serial production line and a theory for its analysis and synthesis together with an account of their application to an industrial system (a paint shop in an automobile plant) with demonstrated quantifiable benefits.
"Knowledge-Based Computer Vision Systems for Industrial Control" (sub-area 5.2)
by M.G. RODD, F. DERAVI, Q.M. WU and J. POWRIE (presented by M.G. Rodd, Dept. of Electrical and Electronic Engineering, University of Wales, Swansea, UK)
In recognition of a paper and its presentation,providing important insights and highlights of results obtained through years of work aimed at developing and applying computer vision methodology to tasks of inspection and control.

YOUNG AUTHOR PRIZE

This prize was awarded for the contents and presentation of the following paper:

"Differential Geometry of Recursive Nonlinar Estimation"
by Robert Kulhavy (CSFR)

The author's paper solves a long standing problem in the field of non-linear parameter estimation and applications to adaptive filtering and control. The paper provides new, practical and computational algorithms, based on differential geometry and representation theory which yields new insights and complete results.

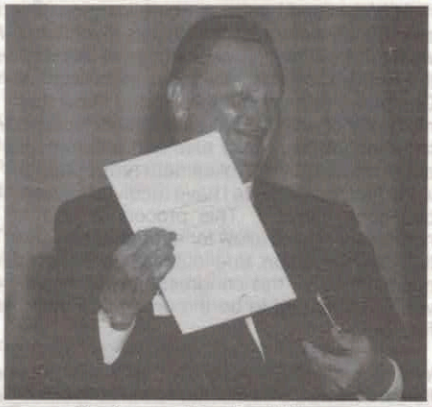
CONTROL EDUCATION TEXTBOOK PRIZE

This prize was awarded to the following book:
"Feedback Control of Dynamic Systems" by G.F. Franklin, J.D. Powell, A. Emami-Naeini

In the opinion of the committee, this book was the most impressive, particularly in terms of providing an excellent first text for the study of feedback control systems. It is extremely well written, easy to read and meets most of the education objectives envisaged by the committee. It also makes a clear effort to motivate the reader by introducing many practical examples. The material is presented in a very logical manner and many worked examples and problems are included.

NEW ADVISOR OF IFAC

At the opening ceremony of the IFAC Congress, President Boris Tamm appointed Professor Manfred Thoma lifetime Advisor of IFAC and presented to him the "Advisor's Seal" of the Federation. Manfred Thoma had been President of IFAC from 1984-87. Before that time he had served IFAC in many different functions. In addition to being a lifetime advisor, Professor Thoma will continue to serve IFAC in his function as Chairman of the Publications Managing Board.



Professor Manfred Thoma

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Stimulating and Rich Technical Program

Speech by Lennart Ljung

at the

Closing Ceremony

of the

11th IFAC World Congress

The 11th IFAC Congress is almost over. During 5 interesting days we have had the - at least theoretical - possibility to listen to 594 paper presentations, 4 plenaries as well as a number of case study- and discussion sessions. It is my duty as the Chairman of the IFAC Technical Board to sum up the impressions from this stimulating and rich technical program.

As you know, the technical program was prepared by 37 Sub-IPCs covering different subareas. More than 2700 abstracts were originally submitted, and you can imagine the amount of work that has been involved. I would like to take this opportunity to thank all the Sub-IPC members and in particular their Chairmen for an admirable work. I know that most of the work had to be done under hard time constraints. I may also add a comment about the submission of camera ready papers in the first round, since I have received several questions about it. This procedure was a necessary step to allow for a reasonable lead time in submission, due to anticipated slower mail service for this congress. It was, however, not intended to be the procedure in the future.

We may roughly divide our area into four fields. One would be the mathematically oriented tools we use for control design; another would be the non-mathematical tools for control design and implementation - this includes CAD and software and hardware at different levels in the control system. A third field are the applications of control design and implementation in various areas. And a fourth field could be called the human aspects of control engineering; this includes education, the social and other effects of automation as well as the role of the control field in society. With this division we have seen in Tallinn some 230 papers each in the areas of mathematical tools and of applications. About 90 papers dealt with the non-mathematical tools, and some 30 papers discussed the human aspects.

The IFAC Congress is the major international meeting in the automatic control area. It offers a unique possibility to contemplate the status of the field and the directions in which it is moving. It is now 30 years since the first Congress. The historic perspective of the development of a fundamental control concept was exposed in Prof. Aizerman's interesting plenary lecture. It is tempting to further dwell on the enormous developments of our field over this period, as reflected by the 11 Congresses. I will not do that, but rather address a more difficult question: what is happening now? How does the 11th Congress differ from the 10th? My personal reflections based on experiences in Tallinn are the following:

The seemingly ever increasing interest in adaptive control appears to have stabilized. It is still, though, the largest single topic in the Congress program.

Non-linear control theory is more exciting than ever. Evidently, the new mathematical and software tools have turned out to be sharp and useful.

Discrete event dynamic systems, as evidenced in various excellent plenary lectures, are attracting more and more interest. We may now see the beginning of a "common language" for this important, but difficult area.

The exciting theoretical development in so-called H-infinity-theory has led to a tool that is now ready to be added to the control engineers' toolbox - a most valuable complement for designs where robustness to model areas is of prime importance.

These are trends in the mathematically oriented areas. The rapid development in computer hardware and software has pointed to the possibility to do sophisticated control design without traditional mathematical analysis. Many sessions of this Congress have dealt with the use of computer size techniques, artificial intelligence and expert systems methodology in control systems, as well as the use of blackbox models and regulator structures on neural nets. This is very important. Unless the control community plays an active role in this development, there is a clear risk that the major part of control systems design will be taken over by the computer science community, and that thus the broad control perspective will be lost. It is especially important that the real time aspects in the use of these tools are given adequate attention.

In the application areas the growing interest in robot control is striking. This was without comparison the largest single application area. Clearly, these non-linear and time-varying systems represent an important challenge to us, especially regarding the next generation of less sturdy constructions. I mentioned that some 230 application papers had been presented here. A clear majority of these of course deal with the real things in terms of industrial plants, etc. - various simulated simplified models. However, it is also that a clear majority of these papers have been written by authors from universities or research institutes. Just as a sample, I checked the number of papers by authors from industry in volume 11 of the preprints (the one that deals with power plants, metal, mining and chemical applications). Out of 55 contributions, 9 are entirely industrial, most of them actually from Germany and Japan. Interesting - but not surprising - is that these papers primarily deal with what could be called model-based control: carefully using physical insight into the plant for the control design, and not so much relying upon ready-made methodologies.

Specialized research may lead to narrow perspectives. It is very important for IFAC to take all aspects and impacts of automation and control into account. At this Congress, for the first time I believe, half of the plenary lectures have been devoted to human aspects of control. In Tom Martin's enlightening survey on automation in a holistic perspective, the human was put in the centre. This is an obvious factor for anyone who deals with introducing automation in the real world, but has to be emphasized to us others over and over again. Today's most educational plenary lecture by Walter Schaufelberger really dealt with tomorrow's control engineers. This next generation will no doubt deal with interesting and difficult problems in very complex systems. It is vital how we educate them today.

The triennial IFAC Congress is, I repeat, a major international technical event in the field of control engineering. It brings together researchers, teachers, and engineers from the whole world. Here we have been 1072 people from 39 countries. The IFAC Congress is the best place not only to follow the recent developments in one's own particular interest area but also to get overviews over what happens in other fields in control engineering. The IFAC Congress is of course also a great place to meet old friends and to make new friends from all over the world. The Estonian team has done an unbelievably excellent job to provide the best possible conditions for us. We thank them all, Ülo Jaaksoo, Ants Work, Boris Tamm and the whole crew behind them for their outstanding job.

automatica

The Journal of IFAC the International Federation of Automatic Control

Papers From the Next Issue – November 1990

Papers

LQG Predictive Optimal Control for Adaptive Applications
(M.J. Grimble)
On a Nonlinear Multivariable Servomechanism Problem
(J. Huang, W.J. Rugh)
Local Nonlinear Model Matching: From Linearity to Nonlinearity
(H.J.C. Huijberts, H. Nijmeijer)
Laguerre Series Approximation of Infinite Dimensional Systems
(P.M. Mäkilä)
Sampled-Data Observer Error Linearization
(S.-T. Chung, J.W. Grizzle)
Self-Organization of Conceptual Generalities and Pattern-Directed Learning
(J. Sawaragi, S. Iwai, O. Katai)
A Model of Operator Behaviour for Man-Machine System Simulation
(P.C. Cacciabue, G. Mancini, U. Bersini)

Brief Papers

Robust Stabilization of Nonlinearly Perturbed Large-Scale Systems by Decentralized Observer-Controller Compensator
(B.-S. Chen, W.-J. Wang)

Book Reviews

Digital Control System Design by G. Hostetter
(G. Franklin)
Mathematical Theories of Non-Linear Systems by S.P. Banks
(D. Aeyels)

IFAC FORTHCOMING EVENTS

1990
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Title	1991	Place	Deadlines	Further Information
IFAC/IEEE/IFIP/IMEKO Symp. Intelligent Tuning and Adaptive Control	Jan. 15-17	Singapore	-	Dr. Kang Chang Guan, Instr.& Control Society; 1 Science Park Drive, Nr 61 A; The Fleming, Singapore Science Park Singapore 0511
IFAC Workshop Modelling and Experimental Verification of Dynamics and Control of Flexible Aerospace Structures	April 2 - 4	Huntsville AL, USA	2 Dec. 1990	Dr.S.M. Seltzer, Control Dynam. Company, Office Park South Suite 304, 600 Blvd South Huntsville, AL 35802, USA
IFAC/IFIP Workshop Real Time Programming	May 15-17	Atlanta, GA USA	15 Jan. 1991	Prof. K. Ramamritham Univ. of Mass., Computer & Information Science Dept. Lederle Graduate Res. Center Amherst, MA 01003, USA
IFIP/IFAC/EWICS Working Conference Dependability of Artificial Intelligence Systems, DAISY '90	May 27-29	Vienna Austria	30 Nov. 1990	Prof.G.H. Schildt Inst.f.Technische Informatik Treitlstraße 3, 1040 Vienna, A
IFAC/(IFIP) Workshop Computer Software Structures Integrating AI/K BS Systems	May 29-31	Bergen Norway	15 Dec. 1990	N.P. Sundby, Norwegian Soc. of Automatic Control Kronprinsensgate 17 N-0251 Oslo, N
IFAC Workshop Electric Power Systems Control Centers	June 17-20	Semmering Austria	-	K. Schenk, Senior Director, Siemens Österreich AG Gudrunstr. 11, A-1101 Vienna, A
IFAC Conference Advances in Control Education	June 24-25	Boston, MA USA		Prof.M.Rabins, Mech.Engg.Dept Texas A&M Univ. College Station, TX 77843-3123, USA
IFAC Workshop Discrete Event System Theory and Applications in Manufacturing and Social Phenomena	June 25-27	Shenyang China, P.R.	1 Oct. 1990	Prof. Xu Xinhe Dept. of Automatic Control Northeast Univ.of Technology Shenyang 110006, PRC
IFAC/IFORS Symposium Identification & System Parameter Estimation	July 8-12	Budapest Hungary	-	G. Hencsey, Computer&Autom. Inst., HAS, Kende u. 13-17 H-1111 Budapest, H
IFAC/IFIP/IMACS Symposium (5th) Computer Aided Design in Control & Engineering Systems	July 15-17	Swansea UK	15 Sept. 1990	Prof.H.A. Barker, Dept. of Elect. Electronic Engg., Univ. College of Swansea, Singleton Park Swansea SA2 8PP, UK
IFAC Symposium Distributed Intelligent Systems DIS '91	Aug. 13-15	Washington DC USA	22 Sept. 1990	Prof. A.H. Levis LIDS 35-410, M.I.T Cambridge, MA 02139, USA
EFMI/IIASA/IFAC Intl. Conference Medical Information Systems and Expert Systems	Aug. 19-22	Vienna Austria	7 Jan. 1991	K.P.Adlassnig, MIE'91 Secr. General c/o Inst. f. Medizin. Computerwissenschaften Garnisong. 13, 8.Hof A-1090 Vienna, A
IFAC Symposium Design Methods of Control Systems	Sept. 4-6	Zurich Switzerland	30 Sept. 1990	Prof. F. Kraus, ETH Zentrum ETL, CH-8092 Zurich Switzerland
IFAC Workshop Distributed Computer Control Systems DCCS '91	Sept. 9-11	Semmering Austria	15 March 1991	Prof. H. Kopetz TU Wien, Inst. f. Technische Informatik, Treitlstr. 3 A-1040 Vienna, Austria
IFAC Symposium Fault Detection, Supervision and Safety for Technical Processes SAFEPROCESS '91	Sept. 10-13	Baden-Baden FRG	-	R.Isermann, Inst. f. Regelungs- technik, TU Darmstadt, FB 19 Schlossgraben 1 D-6100 Darmstadt, FRG

FORTHCOMING EVENTS (ctd.)

IFAC/(IFIP)/IMACS Symposium Robot Control SYROCO '91	Sept. 16-18	Vienna Austria	15 Oct. 1990	Prof.I. Troch, TU Vienna Wiedner Hauptstr. 6-10 A-1040 Vienna, Austria
IFAC Workshop (3rd) Artifical Intelligence in Real Time Control	Sept. 23-25	Napa, CA USA	22 Jan. 1991	Prof.G.J. Suski, Lawrence Livernore Nat.Lab., 7000 East Ave, Livermore, CA-94550, USA
IFAC/ISHS Workshop Mathematical and Control Applications in Agriculture and Horticulture	Sept. 30 Oct. 3	Matsuyama Japan	15 Oct. 1990	Prof. H. Nonami, Dept. of Bio- mechanical Systems, Ehime University, Tarumi Matsuyama 790, Japan
IFAC/Workshop Algorithms and Architectures for Real-Time Control	Sept. 11-13	Bangor UK	*	Prof.D.I.Jones, School of Electronic Engg. Science, UCNW Dean Street, Bangor Gwynedd LL57 1UT, UK
IFAC Symposium Advanced Control of Chemical Processes - ADCHEM '91	Oct. 14-16	Toulouse France	1 Oct. 1990	Prof. K. Najim, ENSIGC Chemin de la Loge F-31078 Toulouse Cedex, France

Title	1992	Place	Deadlines	Further Information
IFAC Workshop AI, Control and Advanced Technology in Marine Automation	April 8-10	Genoa Italy	*	Prof.E.Volta, Ist. Automazione Navale C.N.R., Viale Causa 18R I-16145 Genoa, Italy
IFAC Symposium On-Line Fault Identification and Control in the Chemical Process Industries	April 22-24	Newark Delaware USA	*	Dr.P.Dhurjati, Dept. of Chem. Engg., Univ. of Delaware Newark, DE 19711, USA
IFAC Symposium (7th) Information Control Problems in Manufacturing Technology	May 25-28	Toronto Canada	31 Aug. 1991	Dr.J.Scrimgeour, Advanced Manufacturing Technologies& Ind.Automation, Div.of EE National Research Council Ottawa,Ont. K1A 0R8, CDA
IFAC/IFIP/IFORS/IEA Symposium Man-Machine Systems	June 9-11	The Hague Netherlands	15 Dec. 1990	Prof. P.L.Brinkman Delft Univ.of Technology Fac.of Mech.Engg&Marine Tech Mekelweg 2, NL-2628 CD Delft, NL
IFAC Workshop Artificial Intelligence in Real-Time Control	June 16-18	Noordwijkerhout Netherlands	*	Prof.ir.H.B. Verbruggen Delft Univ. of Technology Fac. of Electrotechn., POB 5031 NL-2600 GA Delft, Netherlands
IFAC Symposium Nonlinear Control Systems Design NOLCOS	June 24-26	Bordeaux France	*	Dr.M. Fliess, CNRS, Lab. des Signaux&Systèmes, Plateau de Moulon, F-91192 Gif s/Yvette, F
IFAC/(IFORS) Workshop Support Systems for Decision and Negotiation Processes	June 24-26	Warsaw Poland	Sept. 1991	R. Kulikowski, System Res.Inst. Newelska 6, PL-01 447 Warsaw Poland
IFAC Symposium Adaptive Control and Signal Processing	July 1-3	Grenoble France	*	L. Dugard, Lab d'Automatique de Grenoble-ENSIEG, BP 46 F-38402 St. Martin d'Hérès, F
IFAC/IFORS/(IFIP)/(IIASA) Symp. (7th) Modelling and Control of National Economies	August 18-20	Beijing China, P.R.	*	Prof. Jong-Ming Wu, Dept. of Computer Science and Techn. Beijing Information Technology Institute, Beijing, China, P.R.
IFAC/IFORS Symposium (6th) Large Scale Systems: Theory and Applications	August 22-26	Beijing China, P.R.	*	Prof. Bao Liu, Inst. of Systems Engineering, College of Engg. Tianjin University, Tianjin China, P.R.
IFAC Symposium (7th) Automation in Mining, Mineral and Metal Processing	August 26-28	Beijing China, P.R.	*	Prof. Huang Tai-Yi, Chinese Association of Automation Institute of Automation, Academia Sinica, POB 2728 Beijing, China, P.R.
IFAC Workshop (2nd) System Structure and Control	Sept. 3 - 5	Prague CSFR	*	Dr.S.Kubik, Inst. of Inf.Theory and Automation, Pod vodarens- kou vezi 4, CS 182 08 Prague, CSFR
IFAC Symposium (3rd) Low Cost Automation	Sept. 9-11	Vienna Austria	*	Prof. P. Kopacek c/o OePWZ Rockhgasse 6, A-1014 Vienna Austria

* **not yet known** - **deadline past**