Contents:

News about the Tallinn World Congress
The International Program Committee Meets
Oulu, SF, June 15, 1988

The next IFAC World Congress will be held in Tallinn, USSR, August 13-17, 1990. The experience of congresses held in Budapest 1984 and Munich 1987 showed that the distributed fashion of organization has several advantages for organizers and participants. The idea of organizing the IFAC Congress 1990 along the lines of the previous two congresses met with a favourable reaction of the IPC members.

The scientific program of the Congress will be grouped into about 35 subject areas. The list of subject areas will be formulated and Sub-IPCs for each of them formed under the guidance of the Technical Committees. Survey/tutorial/review papers will be arranged at technical sessions. Plenary, discussion and case study sessions will be provided.

New fields were proposed to be included into the subject areas, sponsored by Computer, Social Effects of Automation, Mathematics of Control, Components & Instruments and the Theory Technical Committee.

To shorten the time between submission of

full papers and the Congress, a "One-Step Procedure" was discussed and approved at the IPC meeting. There will be no submission of paper drafts. The prospective authors shall send abstracts and return cards attached to the Second Announcement and Call for Papers to the IFAC Secretariat, and then - having obtained "Authors's Kits" from Pergamon Press - full papers to the Congress Secretariat in the USSR. It will enable the IPC to shift the full paper deadline from April to July 1989.

Topics and speakers for Plenary Sessions will be selected by the Committee consisting of the IFAC President, the USSR NMO Chairman and Vice-Chairman, the Editor of the Proceedings and the IPC Chairman, basing on the proposals of the Technical Board and the Technical Committees.

The second IPC meeting will most probably be held in November 1989 in Laxenburg, Austria, in the framework of the Symposium on Skill Based Automated Production.

V. Utkin, IPC Chairman

Hardware and Software for Real Time Process Control
IFIP/IFAC Conference
Warsaw, PL, May 30 - June 1, 1988

The Working Conference on the abovementioned topic was convened by the IFIP Working Group 5.4 (Computerized Process Control) of the Technical Committee on Computer Applications in Technology. From the very beginning it received the co-sponsoring support of two IFAC Technical Committees, i.e. COMPUT and APCOM, as well as of TC 7 on Reliability, Safety and Security of EWICS.

The conference was initially planned as a workshop with the majority of papers invited, covering a fairly broad scope with the ultimate aim of presenting and discussing recent development and trends in real-time computerized control. The emphasis was on the fundamental issues in hardware and software rather than on control aspects. The organizers intended to attract as many experts from foreign countries as possible with a deliberately large scope to give an overview of the field.

Of the total 55 papers presented, 30 were based on personal invitations and the other 25 were selected in a thorough review procedure from 36 contributions received. The authors originated from 16 countries, with 25 coming from universities, 21 from research

labs and academies of science and 8 from industry. 155 participants from 20 countries worldwide, with 79 coming from Poland registered for the Conference.

The bulk of papers was carefully divided into three separate but mutually dependent tracks. The hardware track included separate sessions on bus systems (multibus II and VMEbus developments), extended by panel discussions, multiprocessor systems, and concluded in local area networks (embedded into the distributed systems session). The software track was implemented by separate sessions on programming languages (7 papers on Ada, others on Modula 2, C, and Forth), software specification, software development, expert systems, operating systems, and merged with the hardware track in a session on distributed systems. The integration track started with 2 sessions on reliability and safety, which were backed by the panel discussion, and ended up with separate sessions on standardization and licensing and real time applications. Oral presentations were complemented by poster sessions for shorter communications.

Janusz Zalewski
NOC Chairman

Strategic Plans of IFAC Technical Committees
TC on Applications

This committee is concerned with and involved in applications of automatic control to materials and energy processing in industry, research and testing. Computers, analog, digital or hybrid, are likely to be involved in such applications. The Committee is not concerned with space, societal, management or biological applications of control.

This broad scope is detailed as follows:
The Committee has a policy which tightens the number of APCOM meetings and improves the program profile of the approved events. In the long-range planning effort of the committee, only meetings which are not too broad in scope are sponsored. The pattern of support for a series is continuously monitored. Successful series will be continued and series with declining interest will be stopped and new subject areas will be introduced in harmony with the overall pattern.

The Committee has Working Groups with an important role and high responsibility in forming the scope and programs of the sponsored and co-sponsored IFAC events.

The aims of the Working Groups are:
- To foster international exchange of information and experience on applications of control engineering, systems science and computer science to the design, operation and automation of major plants and systems;
- To promote sponsorship or co-sponsorship by APCOM at regional and international workshops, conferences and symposia dealing with system-oriented problems of major plants and systems;
- To participate through its membership in the technical review of papers dealing with subjects within the scope of the respective Working Group, which are submitted for presentation at workshops, conferences, symposia and the World Congress;

The subjects which will be central for the Working Groups are the following:
- The introduction of new technologies and methods based on microcomputers is not straightforward in that security aspects and control reliability are very stringent for modern plants and systems, specially for large nuclear and fossil-fired power stations;
- The application of new control concepts generally requires an extensive validation work to identify possible weak points, to gain confidence in their use and to make them ac-

ceptable to the operating personnel.
The above considerations widely justify the huge effort taken by the manufacturers, industry and utilities to gradually move toward fully automated operation of large plants and systems.

Most important subjects of research are therefore:
- Development of accurate and usable modelling and simulation codes to predict the behaviour of major plants and systems in the most critical conditions and to test control system behaviour in such circumstances;
- Evaluation of actual improvements achievable by using new control technologies and concepts;
- Analysis of advanced solutions in man-machine interface able to supply prompt and selected information to plant operators in most critical (incidental) contingencies;
- Design of plant simulators to support engineering assessment and operators' training;
- Application of integrated design concept to process and automate designs, especially for new plants and systems.

The clear interdisciplinary character of the above research subjects can naturally be considered within IFAC, where systems approach, dynamic simulation and automatic control concepts are comprehensively developed and applied.
Therefore, the scopes of the Working Groups are to supply the opportunity to experts coming from different experiences and frameworks, to discuss in a unifying systems approach the most interesting innovations currently proposed and applied to modern power stations. Symposia and workshops specially devoted to these subjects seem to be necessary to deal with the actual problems raised by real-size applications and to stimulate the participation of industrial research representatives. On the other hand, the rather cautious behaviour of industry, utilities and manufacturers, when considering the application of new control technologies to such complex plants, should be properly stimulated by the presentation and diffusion of real innovative applications, which require adequate discussion of most practical aspects.

A list of the APCOM Working Groups and their scopes will be published in one of the next issues of the IFAC Newsletter.

Request for Benchmark Problems

The IFAC Theory Committee is planning to make a collection of "benchmark problems" for the Control Community to be completed by December 1989. The motivation for this study is as follows: It would be useful to have a collection of standard problems for comparing the benefits of a "new design tool". At present, every new design method, identification algorithm, etc. is applied to some ad hoc example, and it is difficult to determine a meaningful comparison between existing techniques.

The format for such benchmark problems might be as follows:

Benchmark Problem No. X
(A) Motivation for problem
What are the features which make this problem interesting, e.g. open loop unstable, non-minimum phase, etc.

(B) Brief Description of Problem Origin
Reference describing nature of problem; its source, etc.

(C) Problem Statement
What is the problem? What data are given, etc.

(D) Name of Person/Organization Submitting the Problem
Address, telephone number, etc. of person submitting problem where additional information (if required) re the problem may be obtained.

Various problem areas which might be considered for benchmark problems are:

(1) Control design - aerospace
process control
(2) Plant identification
(3) Adaptive control
(4) Numerical algorithms related to control
(5) Optimal control
etc.

Action Requested
If you are aware of any problems from your own work or others that you believe might serve as potential benchmark problems, please send your problem description to:

Professor E.J. Davison
Dept. of Electrical Engineering
University of Toronto
Toronto, Ontario, Canada M5S 1A4

as soon as possible.

Software for Manufacturing - PROLAMAT '88
7th IFIP/IFAC Conference
Dresden, GDR, June 14-17, 1988

The scientific program of the conference dealt with the further development and implementation of CAD/CAM systems and their modules. Trends towards computer-integrated manufacturing were under special consideration. The conference was organized in five sessions, reflecting the main topics of PROLAMAT '88.
Session I dealt with development towards CIM, CAD/CAM frame systems, data base systems, CIM strategies and software tools. In addition to the ten papers presented in the first session there were three invited lectures, i.e. Application Ranges of the CAD/CAM System GRAFIS in the Shoe Industry (C. Friedrich, GDR); Bottom-Up Strategies for Successful CIM Implementation (H. Hammer, FRG); Experience with Highly Flexible FMS Solutions in the CSSR (Z. Kozar, CSSR).
Session II dealt with CAD and in particular with solid states modelling, 3-D Modelling, dimensioning methods and geometry representation. This session covered ten presentations and one invited lecture given by H. Katoh (J) on "Experience with CAD/CAM at

Nissan Motor Co. Ltd".
Session III on CAPP and Optimization presented nine papers focusing on simulation of manufacturing, variant and generative planning, process modelling and optimization methods. The papers also concentrated on mathematical approaches to production planning.
Session IV on FMS and robotics brought eight presentations dealing with the problems of quality control and strategy of process supervision. Special points of interest were supervision and process control, distributed data handling, sensorics and FMS layout for assembly.
Session V (Artificial Intelligence) had eight presentations reflecting on the scope of intelligent decision-making. Specific topics were expert systems for CAPP, intelligent supervision and knowledge representation.
In addition to the five sessions there were three roundtables dealing with CIM strategies, information assurance/data handling and requirements for CIM education.
Prof.Dr. Kochan, NOC Chairman

Modelling and Control in Biomedical Systems

IFAC/IMEKO/IMACS Symposium
Venice, Italy, April 6-8, 1988

This was the first Symposium on the theory and applications of modelling and control techniques to biological and biomedical systems. It was organized by the Institute of Systems Dynamics and Bioengineering (LADSEB) of the National Research Council (CNR) and by the Department of Electronics and Informatics of the University of Padova, Italy. It was sponsored by the IFAC Technical Committee on Biomedical Engineering and Control and co-sponsored by the International Association for Mathematics and Computers in Simulation (IMACS) and by the International Measurement Confederation (IMEKO). This Symposium was held at the Fondazione Cini, Isola di San Giorgio Maggiore, Venice, Italy.

The application of the methods of modelling and simulation, control theory and dynamic systems analysis is playing an increasingly important role in the study of biological and physiological systems. The aim of the Symposium was to present and discuss recent developments relating to modelling and control of biomedical systems for research, diagnosis and therapy. Focus was on methodological issues as well as the various physiological systems of the organism viewed from a control angle.

The Symposium was organized in ten technical sessions covering identification and ex-periment design, adaptive control of drug delivery systems, artificial intelligence in medicine, critical care and cellular, circulatory, respiratory, neuromuscular, neurosensory, endocrine-metabolic and pharmacogi-netic systems. Six international experts were invited to present survey papers during the plenary sessions, describing status and perspective in different areas. For every session three keynote lecturers were also invited to review specific topics on the subject of the sessions.

The 88 contributed papers accepted for this Symposium, selected among 120 submitted ones, were presented as posters. Posters were pre-viewed by session chairmen and following their vision they were discussed together with the keynote lectures. All these papers were of high quality and represented the state of the art of the research in the respective fields. All the invited and contributed papers were published in the Symposium preprints. A selection of them will be published by Pergamon Press in its IFAC Symposia Proceedings Series. The contributors came from 26 different countries, stressing even more the international character of the Symposium.

The number of participants was about 170, giving ample opportunity for very active discussions.

In the course of the Symposium strong interest was expressed in continuing discussion on these topics by planning to organize the second Symposium on Modelling and Control in Biomedical Systems in the next years.

C. Cobelli, IPC Chairman
L. Mariani, NOC Chairman

Special Service: Mailing List for IFAC Events

IFAC wants to offer support both to the control engineering community and the organizers of IFAC events. To assist in getting the right information to the right people at the right time, IFAC has decided to set up a data base listing the addresses of people who wish to receive a call for papers of IFAC events in their respective fields of interest (see keywords overleaf). The organizers of IFAC events will then receive lists containing the addresses of people interested in their specific subjects. This data base will be renewed and updated every three years. If you want to have your name included in this data base, please fill in the form and return it to the

IFAC Secretariat
Schlossplatz 12
A-2361 Laxenburg
Austria

I would like to receive detailed information/the Call for Papers from the organizers of IFAC sponsored- and co-sponsored Symposia and Workshops in the areas listed overleaf (please mark one or several of the 25 keywords listed overleaf).

I agree that my address is given to organizers of IFAC sponsored- and co-sponsored events hosting a meeting in one of my fields of interest.

Name: ....

Address: ....

Date: .... Signature: ....

Papers from the Next Issue - Nov. 1988

Obituary: H.J. Kelley
(K.H. Well)

Papers

Observer-Based Multivariable Control of the
Aluminum Cold Tandem Mill
(I. Hoshino, Y. Maekawa, T. Fujimoto, H. Ki-
mura, H. Kimura)
Singular Perturbation Analysis of Linear Sys-
tems with Scalar Quantized Control
(B.S. Heck, A.H. Haddad)
Integrity Against Arbitrary Feedback-Loop
Failure in Linear Multivariable Control Sys-
tems
(M. Fujita, E. Shimemura)
The Linear-Quadratic Optimal Control Ap-
proach to Feedback Control Design for Sys-
tems with Delay
(K. Uchida, E. Shimemura, T. Kubo, N. Abe)
Robust Adaptive Control of Discrete-Time
Systems Using Persistent Excitation
(T-H. Lee, K.S. Narendra)

Recursive Bayesian Estimation Using Piece-
Wise Constant Approximations
S.C. Kramer, H.W. Sorenson)
Nonlinear Least-Absolute-Values and Mini-
max Model Fitting
(A. van den Bos)

Brief Papers

Two degrees of Freedom Feedback and
Feedforward Optimal Control of Multivariable
Stochastic Systems
(M.J. Grimble)
Linear Quadratic Regulators with Eigenvalue
Placement in a Specified Region
(L.S. Shieh, H.M. Dib, S. Ganesan)
Bias Reduction in Parameter Estimation
(L.X. Le, W.J. Wilson)
Annihilator Structure of a Principal Ideal: Re-
lation to Optimal Compensators
(D.G. Meyer)
Global Connective Stability of a Class of Ro-
botic Manipulators
(J.K. Mills, A.A. Goldenberg)

Book Reviews

Systems and Control Encyclopedia by M.G.
Singh, Editor
(Y.Y. Haimes)
Supercomputer Architecture by P.B.
Schneck
(W. Weber)
Automatic Control Systems, 5th edition by
B.C. Kuo
(T. Glad)

Real Time Programming
15th IFAC/IFIP Workshop
Valencia, E, May 25-27, 1988

The 15th IFAC/IFIP Workshop of this series
was organized by a group from the Polytech-
nical University of Valencia on behalf of CEA-
IFAC, the Spanish National Member Or-
ganization of IFAC. It was held at Benicassim,
70 km North of Valencia and attended by 46
participants coming from 12 countries.
The aim of the Workshop was to present and
discuss recent developments in the field of
real-time programming. A total of 13 papers
was selected for presentation by the Interna-
tional Program Committee. There were 5
technical sessions of formal specifications,
methodologies and tools, languages for real-
time programming, applications, operating
systems and implementation aspects. All the
sessions had a first part in which papers were
presented, followed by a general dis--
cussion on the topic of the session. Two
round table discussions, on formal specifica-
tions and real-time programming languages,
were also included. All the discussions had a
high degree of participation, with very inter-
esting contributions by most of the partici-
pants.
The IFAC Working Group on Real-Time Pro-
gramming had its first meeting during the
Workshop. The scope of the Group was dis-
cussed and suggestions and guidelines
were given for future acitivities, starting with
the 16th Workshop on Real-Time Program-
ming that will be held in Berlin, GDR, from
16-19 May, 1989.
J.A. de la Puente, IPC Chairman

Keywords:

1 ☐ Adaptive Control and Systems		14 ☐ Economic and Management Systems	
2 ☐ Aerospace		15 ☐ Education	
3 ☐ Agriculture		16 ☐ Electric Power Systems	
4 ☐ Artificial Intelligence		17 ☐ Identification&Parameter Estimation	
5 ☐ Biomedical Engineering and Control		18 ☐ Large-Scale Systems	
6 ☐ Biotechnology		19 ☐ Man-Machine Systems	
7 ☐ Chemical Process Control		20 ☐ Manufacturing Technology	
8 ☐ Components and Instruments		21 ☐ Marine Control	
9 ☐ Computer Aided Design		22 ☐ Metallurgy, Mining and Mineral Processing	
10 ☐ Computers in Control		23 ☐ Modelling and Control of Non-Technical Systems	
11 ☐ Control Design		24 ☐ Nonlinear Systems	
12 ☐ Distributed Parameter Systems		25 ☐ Social Effects of Automation	
13 ☐ Distributed Systems			

Title	1989	Place	Deadlines	Further Information
SCS/IFIP/IFAC Workshop Artificial Intelligence in Management & Economics	January 11-13	Singapore	-	Mrs. Vicky Toh, Inst.of Systems Science, National University of Singapore Kent Ridge, Singapore 0511
IFAC Symposium Adaptive Systems in Control and Signal Processing	April 19-21	Glasgow UK	-	Ms. Rosamund da Gama The Institute of Measurement and Control, 87 Gower Street London WC1E 6AA, UK
IMEKO/IFAC Symposium (6th) Technical Diagnostics 89	May 31 - June 2	Prague CSSR	-	House of Technology, CSVTS Ms. L. Jarolimkova Gorkeho nam. 23 CS-11282 Prague 1, CSSR
IFAC/IIASA/UNESCO/IEEE Workshop International Conflict Resolution Using Systems Engineering	June 5-8	Budapest Hungary	*	Acad.T.Vamos Computer and Automation Inst. HAS, Victor Hugo u. 18 H-1133 Budapest, Hungary
IFAC Workshop (8th) Control Applications of Nonlinear Programming and Optimization	June 7-9	Paris France	*	AFCET 156, blvd. Péreire F-75017 Paris, France
IFAC/IEEE Symposium Nonlinear Control Systems Design	June 14-16	Capri Italy	-	Prof.S.Monaco, University of Rome "La Sapienza", Via Eudossiana 18, I-00184 Rome, Italy
IFAC/IMACS/IFIP Symposium (5th) Control of Distributed Parameter Systems	June 26-29	Perpignan France	-	A.El Jai, Lab. d' Automatique IMP du CNRS, Univ. de Perpignan 50, Avenue de Villeneuve F-66000 Perpignan France
RSO/IFAC/IEEE Conf. The Riccati Equation in Control, Systems and Signals	June 26-30	Como Italy	*	Prof.S. Bittanti, Dept. of Electronics, Milan Polyt. Piazza L.da Vinci, I-20133 Milan, Italy
IFAC/IFORS/IFIP/SEDC Conf. Dynamic Modelling and Control of National Economies	June 27-29	Edinburgh UK	-	Prof.B.Rustem, Imperial College Univ.of London, 180 Queens Gate London SW7 2BZ, UK
IFAC/IFORS/IMACS/IEEE Intl. Conference Advanced Information Processing in Automatic Control	July 3-7	Nancy France	Dec. 15 1988	R. Husson, Dir. du CRAN LAUT-ENSEM, 2, rue de la Citadelle, BP 850 F-54100 Nancy Cedex, France
IFIP/IFAC Conference (14th) System Modelling and Optimization	July 3-7	Leipzig GDR	Dec. 15 1988	Dr. K. Tammer Leipzig Univ. of Technology Dept. of Math&Informatics POB 66, DDR-7030 Leipzig,GDR
IFAC Symposium (7th) Automatic Control in Aerospace	July 17-21	Tsukuba Japan	-	Prof.T.Tanabe, Dept.of Aeronautics University of Tokyo, Fac. of Engrg. 7-3-1 Hongo, Bunkyo-ku, Tokyo 113 Japan
IFAC Workshop Singular Perturbations and Asymptotic Methods in Systems and Control	August 17-18	Boston MA, USA	*	Prof. M. Ardema Dept. of Mech.Engg. Santa Clara University Santa Clara, CA 95053, USA
IFAC/EFCE Symposium Dynamics and Control of Chemical Reactors, Distillation Columns and Batch Processes	August 21-23	Maastricht Netherlands	Oct. 1 1988	DYCORD+ '89 c/o KIvI POB 30 424 NL-2500 GK The Hague, NL
IFAC Workshop Expert Systems and Signal Processing in Marine Automation	August 21-23	Copenhagen Denmark	Feb. 20 1989	Danish Automation Society Bldg. 343 Techn. University of Denmark DK-2800 Lyngby, Denmark
IFAC Symposium Power Systems and Power Plant Control	August 22-25	Seoul Korea	Nov. 30 1988	Prof. Jang Gyu Lee Dept. of Control and Instr.Engg. Seoul National University Seoul 151-742, Korea
IFAC/IFORS/IMACS Symposium Large Scale Systems: Theory and Applications	August 29-31	Berlin GDR	-	Prof. H.Fuchs, AdW d. DDR Kurstraße 33 DDR-1086 Berlin, GDR
IFAC Symposium Automation in Mining, Mineral and Metal Processing	Sept. 4-8	Buenos Aires Argentina	-	Dr.J.Paiuk, c/o AADECA Av.Callao 220 10B 1022 Buenos Aires, Argentina

Title	1989	Place	Deadlines	Further Information
IFAC/IFIP/IEA/IFORS Conference Analysis, Design and Evaluation of Man-Machine Systems, MMS 89	Sept. 12-14	Xian PRC	-	Prof. Wang Ying Luo Xian Jiaotong University Xian, Shaanxi, PRC
IFAC/IFIP/IFORS/CIRP Workshop Decisional Structures in Automated Manufacturing	Sept. 18-21	Genova Italy	Nov. 15 1988	Prof. A. Villa, Dip. Tecnologia e Sistemi di Produzione Politecnico di Torino, C.so Duca degli Abruzzi 24 I-10129 Torino, Italy
IFAC Workshop (2nd) Artificial Intelligence in Real-Time Control	Sept. 19-21	Shenyang PRC	Dec. 31 1988	Ms Chen Da-yang Shenyang Intl. Conf. Centre for Science and Technology No.3, Li 3, Section 4 Minzu Str. Heping District Shenyang, PRC
IFAC/IFIP/IFORS Symposium Control, Computers, Communications in Transportation – CCCT '89	Sept. 19-21	Paris France	-	AFCET - CCCT '89 156, boulevard Péreire F-75017 Paris, France
IFAC Workshop System Structure and Control: State Space and Polynomial Methods	Sept. 25-27	Prague CSSR	*	Prof. S. Kubik, CSSR Academy of Sciences, Inst. of Information Theory & Automation; Pod vodarenskou vezi 4, CS-182 08 Prague, CSSR
IFAC Workshop (9th) Distributed Computer Control Systems - DCCS '89	Sept. 26-28	Tokyo Japan	*	Prof. S. Narita Waseda University Dept. of Electr. Engineering Tokyo 160, Japan
IFAC/IFIP/IMACS/IFORS Symposium (6th) Information Control Problems in Manufacturing Technology	Sept.29 Oct.1	Madrid Spain	Dec. 15 1988	INCOM '89 E.T.S. Ingenieros Industriales Po. Castellana, 80 E-28006 Madrid, Spain
IFIP/IFAC Conference Computer Applications in Production and Engineering, CAPE 89	October 2-5	Tokyo Japan	-	Conference Secretariat CAPE 89 c/o Conference Dept.; Business Center for Academic Societies Japan, 2-40-14 Hongo, Bunkyu-ku Tokyo 113, Japan
IFAC Workshop Distributed Databases in Real Time Control	October 16-18	Budapest Hungary	*	Dr. E. Knuth Computer and Automation Inst. HAS, BP 63, H-1502 Budapest Hungary
IFAC Workshop Evaluation of Adaptive Control Strategies in Industrial Applications	October 16-20	Tbilisi USSR	March 15 1989	Acad. V.A. Trapeznikov 65 Profsojuznaja Street SU-117806 Moscow, USSR
IFAC/IFIP Workshop Real Time Programming	October 20-22	Berlin GDR	June 1 1989	WRTP `89 Kammer der Technik, WGMA Clara Zetkin Str. 115/117 DDR-1086 Berlin, GDR
IFAC/IFORS/IAEE Symposium Energy Systems, Management and Economics	October 25-27	Tokyo Japan	Feb. 28 1989	ESME '89 Secretary Dr. Kenji Yamaji Central Research Institute of Electric Power Industry 1-6-1 Ohtemachi, Chiyoda-ku Tokyo 100, Japan
IFAC Workshop Production Control in Process Industry	Oct.30- Nov. 2	Kyoto Japan	*	Prof. T. Takamatsu, Kyoto Univ. Japan Institute of Systems Research, 4, Yoshida-Ushino-miya Sakyo, Kyoto 606, Japan
IFAC Symposium Low Cost Automation: Techniques, Components & Instruments, Applications	Nov. 8-10	Milan Italy	Feb. 1 1989	IFAC-LCA '89 Secretariat Dip. Informatica e Sistemistica Via Eudossiana 18 I-00184 Rome, Italy
IFAC/(IMACS)/IFIP Symposium Skill Based Automated Production	Nov. 15-17	Vienna Austria	Dec. 15 1988	Prof. P. Kopacek Systemtechnik und Automatisierung, University of Linz A-4040 Linz-Auhof, Austria
IFAC/IFIP Workshop Safety of Computer Control Systems - SAFECOMP '89	Dec. 5-7	Vienna Austria	*	Prof. P. Kopacek Systemtechnik und Automatisierung, University of Linz A-4040 Linz-Auhof, Austria