1991 No. 6 Dec.

Newsletter

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To all our Affiliates and Readers

A Merry Christmas and a Peaceful, Successful and Happy 1992

12th IFAC World Congress
Darling Harbour, Sydney, Australia
19 – 23 July, 1993

Invitation

To control engineers and scientists of all nations, I am privileged to address an invitation to participate at the 12th World Congress of IFAC. The place is Sydney, Australia and the dates are 19-23 July, 1993.

The International Program Committee, comprising outstanding leaders in our profession, is structuring the Congress to emphasize a number of technical subfields which constitute fast moving and challenging areas of our discipline. You can read about them in more detail below. They include automotive control, discrete event systems, process control, control in mining, mineral and metal processing and some ten other selected fields. The goal of the IPC is to make this congress a technical highlight in the history of IFAC Congresses, and a memorable meeting – because of the technical benefits – to all who attend.

The breadth of the Congress is allowing the creation of a programme with interest to industrial specialists of all types, as well as academics researching the frontiers of the subject. Generous incorporation of plenary and survey papers in the programme will offer attendees an opportunity to become informed outside their own specialities.

Those who have been to Sydney before usually want very much to come back. For those who have never been, they have a treat in store. Sydney is one of the most beautiful cities of the world, and the people are well known for their friendliness. No one should attend the Congress without allowing some time to sample the non-technical side of Sydney, if not also other parts of Australia.

I look forward very much to welcoming you in Sydney in July 1993.

Brian Anderson

Brian D.O. Anderson
President of IFAC

Technical Program

In common with previous IFAC World Congresses, the scope of the Sydney Congress encompasses all aspects of the science and technology of automatic control covering both the theory and its diverse applications. However, in addition to the Regular Papers, covering the 15 broad areas represented by the IFAC Technical Committees, the Sydney Congress also includes areas of special concentration. These are represented by 6 Minisymposia and 8 Target Areas. It is expected that roughly one half of the Congress will be devoted to regular papers and the remainder to Minisymposia, Target Areas and Plenary Sessions. Minisymposia will occupy one room at the conference centre for either a whole day or half a day throughout the 5 days of the conference. Similarly, Target Areas will occupy one room each for either a whole day or half a day. If you want to receive more information on the Congress or wish to submit an abstract, please send the Return Card, printed on page 2, to the address given.

IFAC Control Education Textbook Prize
Call for Nominations

The Education Committee of IFAC calls for nominations for the triennial IFAC Textbook Award. The award is to author(s) of that control engineering textbook judged to have most contributed to the education of control engineers. The book must have been published between July 1984 and August 1990. The award, consisting of a monetary award and a certificate, will be presented at the closing awards ceremony of the 1993 IFAC Congress in Sydney, Australia.
A nomination letter must include the full title, name and address of authors, date of publication, and name and address of the publisher. The selection committee will take into account any additional information submitted with the nomination including book reviews, letter of support, publisher's data, list of adoptions, etc. Please send nomination material to

Professor Michael J. Rabins
Texas A&M University
College Station, TX 77843-3123, USA

To be considered, a nomination must be received by September 1, 1992. The winner(s) will be notified by May 1, 1993 so that advance plans can be made to attend the award ceremony if desired.

Mathematical and Control Applications in Agriculture and Horticulture

IFAC / ISHS Workshop
Matsuyama, Japan, 30 Sept. – 3 Oct., 1991

The Workshop was organized by the Working Group on Automatic Control Applications in Agriculture of the Technical Committee on Applications and is the first one that dealt with agricultural systems in IFAC.

The total number of participants was 160 coming from 14 different countries. There were 51 oral presentations in 8 technical sessions, including 19 invited speakers. In addition there were 2 poster sessions presenting a total of 35 posters.

The technical presentations dealt with the following subjects: Greenhouse systems, plant factory systems, post-harvest technology, robotics, information, model and control, measurements in controlled systems and control in irrigation systems.

Professor Laszlo Keviczky, Vice-Chairman of the Technical Board of IFAC opened the Workshop on behalf of IFAC. Professor Yoshikazu Sawaragi, former President of IFAC, presented the welcome address at the banquet.

The Workshop offered an opportunity for fruitful discussions and exchange of opinions both in the field of system science and biological production. It may be noted that these interdisciplinary workshops could only reform agricultural production such as advanced greenhouse and plant factory based on environment control. All participants were fully satisfied with the meeting and are looking forward to having the next Workshop in 1994.

Dr. Y. Hashimoto
IPC Chairman

Y. Sawaragi, N.N. Farkas, Y. Hashimoto, L. Keviczky

Real-Time Programming
17th IFAC / IFIP Workshop
Atlanta, GA, USA, 15 – 17 May, 1991

In recent years the interest in all aspects of real-time computing has increased significantly. This is not only due to accelerated research efforts undertaken in this area but also due to an expanding worldwide market for various types of real-time computing systems.

The Workshop on Real-Time Programming provides an opportunity to assess the state of the art, to present new results, and to discuss possible lines of future developments. Its primary focus is on software development for real-time systems and real-time operating systems. The IFAC/IFIP Workshop on Real-Time Programming takes place twice in every three year period. As a truly international event, it is each time held in different parts of the world. Since the participation from North America was unsatisfactory in recent years, it was decided to hold the meeting in the United States in 1991 and to organize it jointly with a thematically related national event, viz. the IEEE Workshop on Real-Time Software and Operating Systems. As a member of the Americal Automatic Control Council, IFAC's NMO in the USA, the IEEE sponsored this joint workshop and took the financial responsibility.

The 24 contributed papers were selected out of 63 submissions to the joint Workshop. The contributions came from Europe, North America and South America: 46 from academia, 16 from industry and one from a government agency. Six sessions based on these contributions were organized in the following areas: Scheduling, operating systems, tools, programming languages, experience, and case studies.

In addition to the discussions that took place in each of these sessions and during the breaks, the Workshop devoted ample time for focussed discussions by arranging four panels addressing the following topics: Fault tolerance, programming languages, scheduling, and operating systems. After short statements by the panelists, lively discussions ensued with a large number of contributions from the audience. The Proceedings contain reports summarizing the opinions expressed during the panel discussions.

Wolfgang Halang
IPC Chairman

Newly Approved Events

Title	Date	Place	Deadlines	Further Information
IFAC Workshop Expert Systems in Agriculture	August 12-14, 1992	Hefei China, P.R.	15 Jan. 1992	Prof. Ting-Jian Fang The Institute of Intelligent Machines Academia Sinica, POB 1130 Hefei, Anhui, China, P.R.
CPPA/IFAC Conference Control Systems '92 - Dreams vs. Reality, Modern Process Control in the Pulp and Paper Industry	Sept. 28 Oct. 1, 1992	Whistler, BC Canada	*	Prof. J. O'Shea, Ecole Polytechnique C.P. 6079, Succ. A Montreal, Quebec H3C 3A7, Canada
IFAC/IMACS/IMEKO/IEEE Workshop Motion Control for Intelligent Automation	October 28-29, 1992	Perugia Italy	31 March 1992	Prof. A. DeCarli Dept. of Computers & Systems Sciences University of Rome "La Sapienza" Via Eudossiana 18 I-100184 Rome, Italy
IIFAC Workshop CIM in Process and Manufacturing Industries	November 23-25, 1992	Helsinki Finland	*	Prof. K. Leiviskä Univ. of Oulu, Dept. of Process Engg. SF-90470 Oulu, Finland
FAC Workshop Intelligent Autonomous Vehicles	April 18-21, 1993	Southampton UK	September 1992	Prof. C. J. Harris Lucas Prof. of Aerospace Systems E. Dept. of Aero & Astro, Univ. of Southampton Southampton SO9 5NH, UK
IFAC Workshop AI in Economics and Management	August 25-27, 1993	Portland, OR USA	*	Prof. Kuan-Pin Lim, Dept. of Economics Portland State Univ., POB 751 Portland, OR 97202, USA

* not yet known

Introducing IFAC Technical Committees
TC on Developing Countries

The Committee is mainly aimed at the development of automatic control and related topics in developing countries. Since IFAC is a Federation of long standing, it has gained through the years a wide experience, and DECOM has the duty of stimulating developing countries to create National Member Organizations in order to be able to join IFAC. DECOM also has the task of inviting NMOs of those countries to organize workshops, symposia and regional conferences to bring together as many scientists as possible in order to compare their experiences and to benefit from invited specialists. Because of the shortage of funds in their own countries, the Committee seeks support from various sources to help authors from developing countries to attend IFAC events.

The current chairman of DECOM is
Prof. A. Kaya
University of Akron, Dept. of Mech. Engg.
Akron, OH 44325-3903, USA

Upon initial study and discussions with DECOM members and others, the committee will function by the following structure and activities.

Working Groups will be structured according to the following criteria:

A. Geographical area base
   A1   Middle East - Europe - Africa
   A2   Asia - Far East - Australia
   A3   American Continent
The purpose of this structure is to deal with geographical and cultural issues closely.

B. Specialty base within IFAC
   B1   Inter TC Working Group
As DECOM is an interspecialty or interdisciplinary committee with a special focus, it must interact with other TCs to be functional and successful.

C. Liaison Base outside IFAC
There are many other organizations which may be useful to work with for our goals. Therefore, continuing contact, collaboration, and cooperation is necessary.

Information Exchange

A Newsletter of DECOM may be used for listing 'Resources Sought' and 'Resources Available'. This information may be about e.g. educational tools, specialists, high tech items.

Resources Available:

Minitools for Education in Control System Analysis and Design:
Minitools are software tools that have been especially designed and implemented for use in education and on small industrial problems. They offer limited capabilities if compared to full grown commercial systems but are much easier to learn and use. Four such programs are introduced: Abakus, a program for function graphing; DESolver for differential equation solving; Frequency, for frequency response analysis and design, and BDE Sim for simulation and frequency response analysis from block diagrams. The four programs run currently on Macintosh and IBM compatible PCs and are being ported to the Atari. All programs are in the public domain; on the IBM PC a GEM desktop is needed to run them. The programs can be obtained from the Project Center IDA, of ETH Zürich at a handling charge of sFr 100,–.

For this purpose, please write to:
W. Schaufelberger
Projektzentrum IDA, ETH Zentrum
CH 8092 Zürich
Switzerland

Papers From the Next Issue – January 1992

Papers

Toward Intelligent PID Control
(K.J. Åström, C.C. Hang, P. Persson, W.K. Ho)
Small Amplitude Chaos and Ergodicity in Adaptive Control
(B.E. Ydstie, M.P. Golden)
Singularity-Free Adaptive Pole-Placement without Resorting to Persistency of Excitation: Detailed Analysis for 1st Order Systems
(R. Lozano-Leal)
Multirate Control: A New Approach
(H.M. Al-Rahmani, G.F. Franklin)
Sampled Data Control of Continuous Time Systems with an H∞ Optimality Criterion
(H.T. Toivonen)
H∞ Control Problem with jw-axis Zeros
(S. Hara, T. Sugie, R. Kondo)
Clockwise Property of the Nyquist Plot with Implications for Absolute Stability
(A. Tesi, A. Vicino, G. Zappa)
Internal and External Stability and Robust Stability Condition for a Class of Infinite Dimensional Systems
(Y. Yamamoto, S. Hara)
Sequential Decomposition and Policy Iteration Schemes for M-player Games with Partial Weak Coupling
(R. Srikant, T. Basar)
Computationally Efficient Algorithms for On-Line Optimization of Markov Decision Processes
(A. Jalali, M.J. Ferguson)
A Tutorial on the Geometric Analysis of Linear Time-Invariant Implicit Systems
(F.L. Lewis)

Brief Papers

An Analog 'Neural Net' Based Suboptimal Controller for Constrained Discrete Time Linear Systems
(M. Sznajer, M.J. Damborg)
Robust Output Tracking Control of Nonlinear MIMO Systems via Sliding Mode Technique
(H. Elmali, N. Olgac)
The Application of Parameter Optimization Techniques to Linear Optimal Control System Design
(C. Frangos, J.A. Snyman)
Linear Control of Nearly Singularly Perturbed Hydro Power Plants
(D. Skataric, Z. Gajic)
Application of Critical Velocities to the Minimisation of Fuel Consumption in the Control of Trains
(C. Jiaxin, P. Howlett)
Selection of Input and Output Variables as a Model Reduction Problem
(J.P. Keller, D. Bonvin)
To Tune or Not to Tune: A Monitoring Procedure to Decide
(R. Ortega, G. Escobar, F. Garcia)
Automated Synthesis of Decentralized Tuning Regulators for Systems with Measurable DC Gain
(L. Hsu)
Competitive Identification for Self-Tuning Control: Robust Estimation Design and Simulation Experiments
(Z. Kowalczuk)
Intertemporal Electricity Exchange Through Barter
(J. Ruusunen)
A Polynomial Approach to the MIMO LQ Servo and Disturbance Rejection Problems
(E. Mosca, L. Giarré)
Decentralized State Estimation in Large-Scale Interconnected Dynamical Systems
(M. Saif, Y. Guan)
On the Convergence of Minimum Variance Directional-Forgetting Adaptive Control Scheme
(M. Campi)

Reachability in Input Constrained Discrete Time Linear Systems (P. d'Alessandro, E. de Santis)

Book Reviews

Real Time Software for Control, by Davis M. Auslander and Cheng G. Tham
(M.G. Rodd)

Call for Papers
IFAC Journal Automatica
Special Issue on
Statistical Signal Processing and Control

The borderline between control theory and signal processing is vague. There has been a growing interest among control engineers to apply signal processing methods and tools to control problems. Also, many results in signal processing are based on control and system methodologies. The interaction and collaboration between the signal processing and control communities has been a fruitful endeavour, progressing both areas. The purpose of an Automatica Special Issue on „Statistical Signal Processing and Control" is to further stimulate joint efforts. The topics in mind for this special issue are:

Signal Modelling with Applications in Control. Techniques for modelling and estimating signals have many important applications in control. One important example is modelling of disturbances, which is a fundamental issue for prediction and stochastic control. The scope of 'Signal Modelling' is quite broad. Preference will be given to papers where there is a clear potential of the results of control problems.

Array Signal Processing. The area of sensor array processing has attracted considerable interest lately. This problem is closely related to harmonic retrieval, factor analysis and system identification. Many algorithms have been proposed and aspects such as computational complexity, estimation accuracy and modelling uncertainty have been analyzed. Several techniques have direct application in system identification and parameter estimation.

Both 'Regular' and 'Brief' Papers are welcome. The Special Issue will be organized by

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S-100 44 Stockholm, Sweden
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Authors are invited to submit six (6) copies of the paper to Torsten Söderström, Associate Editor of Automatica, under the address above. One copy, with a copy of the correspondence to Professor Söderström, should be sent as usual to

Mr. G.S. Axelby
Editor-in-Chief of Automatica
211 Coronet Drive
North Linthicum, MD 21090, USA

The timetable of the special issue is as follows:

Submission deadline: September 1, 1992
Final Selection of Papers: March 1, 1993
Publication: January 1994.

Björn Ottersten, Torsten Söderström, Bo Wahlberg

WHO IS WHO IN IFAC
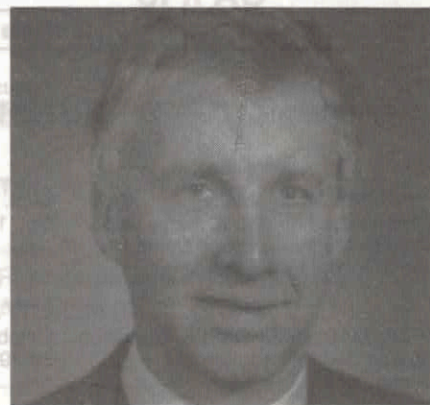
Prof. Manfred Deistler
Chairman of EMSCOM

Professor Manfred Deistler was born in St. Pölten, Austria, in 1941. He studied at the Vienna University of Technology, where he received the degree of Diplomingenieur (corresponding to an M.S.) in Electrical Engineering in 1964. In 1968 he finished his diploma in economics at the Institute of Advanced Studies in Vienna. In 1970 he passed his PhD with honours in Applied Mathematics at the Vienna University of Technology. The topic of his thesis was: The Theory of Stationary Stochastic Processes and its Application in the Spectral Analysis of Time Series.

Professor Deistler started his professional career as control engineer in the research and development section of ELIN Union (Austria's largest engineering corporation, where he worked from 1965 to 1966. From 1968-1971 he was assistant professor at the Institute of Econometrics at the University of Regensburg in Germany. He held the same position at the Institute of Econometrics and Operations Research at the University of Bonn in Germany from 1971 to 1973. He then was Associate Professor at the Department of Statistics, Institute for Economic and Social Sciences at the same university from 1973 to 1978. In 1978 he was appointed full professor at the Institute of Econometrics, Operations Research and Systems Theory at the University of Technology of Vienna, a position which he still holds.

In the course of the years, Professor Deistler has undertaken extensive research or given lecture series at many different universities, among them the University of Löwen, the Australian National University, Stanford University, the University of California (San Diego), the University of Pennsylvania, the University of Groningen and the University of Rio de Janeiro.

Professor Deistler was in charge of several research projects, among them one at the Center of Excellence dealing with Applied Mathematics, two on Econometrics and one respectively on Time Series Analysis and TEC Errors in Variables Models. His lecture series include lectures on Basic Statistics (for economists), Advanced Statistics, Probability Theory, Econometrics I and II, Stationary Processes, Time Series Analysis, Linear Systems, System Identification and Environmental Economics.

Professor Deistler has held and holds several positions in Austrian as well as international associations. In IFAC, Professor Deistler holds the position of Chairman of the Technical Committee on Economics and Management Systems.