For immediate release

IFAC Symposia 1974

Subject	Date	Place	Contact Address
4th Digital Computer Applications to Process Control (co-sponsors: IFIP, IMEKO, RILEM)	March 19 – 22	Zürich, Switzerland	IFAC/IFIP Conference, Wasserwerkstrasse 53, CH 8006 Zürich, Switzerland
Automatic Control for Agriculture (co-sponsor: IFIP)	June 18 – 20	Saskatoon, Saskatchewan, Canada	Dr. G. C. Zoerb, Agricultural Engrg. Dept., University of Saskatchewan, Saskatoon, Canada
6th Automatic Control in Space	August 26 – 31	Tsakhkadzor, Armenian SSR, USSR	IFAC Symposium Organizing Committee, Institute of Control Sciences, 81 Profsojuznaja St., Moscow V-279, USSR
3rd Multivariable Technological Systems	September 16 – 18	Manchester, Great Britain	3rd IFAC Symp. on Multivariable Technological Systems, Inst. of Measurement and Control, 20 Peel St., London W 8, England
2nd Traffic Control and Transportation Systems (co-sponsors: IFIP, IFORS)	September 16 – 21	Monte Carlo, Monaco, France	AFCET, Service Congrès, Université Paris IX – Dauphine, 75775 Paris – CEDEX 16, France
Stochastic Control	September 25 – 27	Budapest, Hungary	Conference Bureau, Computer and Automation Inst. of the Hungarian Academy of Sciences, H-1502 Budapest 112, P.O.Box 63, Hungary
Discrete Systems	Sept. 30 – Oct. 4	Riga, Latvian SSR, USSR	Institute of Electronics and Computing Technique, Academy of Sciences, Latvian SSR, 14, Akademijas St., Riga-226006, USSR
Control in Power Electronics and Electrical Drives	October 7 – 9	Düsseldorf, Fed. Rep. of Germany	VDI/VDE-Gesellschaft für Mess- und Regelungstechnik, P.O.Box 1139, D-4000 Düsseldorf 1, FRG
Optimization Methods – Applied Aspects (co-sponsor: IFORS)	October 8 – 11	Varna, Bulgaria	IFAC 1974, Committee for Science, Technical Progress and Higher Education, 8 Slavyanska Street, Sofia, Bulgaria
Systems Engineering Education in Developing Nations (co-sponsor: IFORS)	November 4 – 7	New Delhi, India	Brig. D. Swaroop, Convener, IFAC Symposium 1974, The Institution of Engineers (India), 8 Gokhale Road, Calcutta 700020, India
Modelling of Multidisciplinary Problems via Systems Theory	November or December	Mexico City, Mexico	Asociación Mexicana de Control Automático, Instituto de Ingeniería, Universidad Nacional Autónoma de México, México 20, D.F., México

An announcement and call for papers relative to the above symposia either was published (in IFAC Bull. Nos. 73, 75, 76, 77, 79) or, in the case of Mexico, is planned to be published in due time.

The list of IFAC symposia 1974 may be extended by one more symposium which, at the present time, is only tentative, viz. a symposium on Actuators in Control Circuits, Barcelona, Spain, October 1974.

The following IFAC Workshops (limited number of invited participants) are planned for 1974:

- Productivity and Man, January 21 – 25, Bad Boll, FRG,
- Corporate Control Systems, April 2 – 4, Enschede, Netherlands,
- Real-Time Programming (IFAC-IFIP), April, Budapest, Hungary.

6th Automatic Control in Space

The sixth in a series of IFAC symposia on Automatic Control in Space, started in 1965, will be held from August 26 to 31, 1974 at Tsakhkadzor, 40 km from Yerevan, Armenian SSR, USSR. A preliminary announcement was issued in Bulletin No. 75 and supplementary details have now become available. The following topics will be covered by the scientific programme which will include engineering solutions as well as challenging theoretical findings:

- Complex systems and elastic systems studies, optimization methods
- Far space missions, planetary missions
- Control of aerospace vehicles
- Crawling and walking systems, robots and manipulators
- Control of surface vehicles
- Underwater vehicle control
- Man-machine interface, computer control of missions
- Orbital control, navigation and control, systems of satellites, rendez-vous and docking
- Attitude control, orientation, stabilization, sensors
- Joint Soyuz-Apollo flight
- Findings of lunar vehicles
- Findings of planetary exploration.

The deadline for the submission of full papers is December 31, 1973. Copies of a printed "Second Announcement" brochure with inserted registration card can be obtained from the

IFAC Symposium Organizing Committee,
Institute of Control Sciences,
81 Profsojuznaya Str.,
Moscow, V-279, USSR

to which all enquiries and correspondence should be directed.

Multivariable Technological Systems

The Institute of Measurement and Control under the aegis of the United Kingdom Automation Council is arranging an IFAC Symposium on Multivariable Technological Systems, to be held from September 16 to 18, 1974 in Manchester, England.

The principal theme of the conference will be the development and application of design techniques for the feedback control of multivariable technical systems.

Subsidiary themes related directly to this will be:

- The construction of models for a wide range of engineering multivariable systems
- Techniques of identifying and validating such models
- Comparisons of different types of design technique applied to industrial problems
- Use of computer-aided-design techniques for multivariable feedback system design
- Applications of multivariable feedback control to a wide range of industrial processes.

Other subsidiary themes will be:

- Multilevel and Hierarchial control
- Adaptive control
- Application of design techniques for large systems
- Man-machine problems in multivariable systems.

Further details and application forms will be available in due course from

The Secretary,
3rd IFAC Symposium on
Multivariable Technological Systems,
Institute of Measurement and Control,
20 Peel Street, London, W8 7PD, England.

Optimization Methods – Applied Aspects

An IFAC Symposium on that subject, sponsored by the IFAC Committees on Theory, on Applications, and on Systems Engineering and co-sponsored by the International Federation of Operational Research Societies (IFORS), will be held in Varna, Bulgaria, from October 8 to 11, 1974. The symposium is organized by the Bulgarian National Centre for Cybernetics and Computer Techniques in conjunction with the Bulgarian Scientific Technical Union of Electrical Engineering.

The objective of the Symposium, aimed above all at the application of the theory of optimal control, is to present, discuss and sum up the application of the various methods of optimization.

Papers are solicited on

- Linear and Nonlinear Programming
- Dynamic Programming
- Optimization Methods with Incomplete Information
- Numerical Methods
- Quasi-optimal Control Methods
- Automatic Optimization Methods
- Function Space Methods
- Optimal Control for Large-Scale Systems
- Optimization of Multilevel Control Systems
- Decomposition Techniques for Optimal Control
- Sensitivity Analysis of Optimal Systems
- Differential Games
- Optimization of Biological and Economical Systems.

Potential authors are requested to submit English language abstracts (300 – 500 words, in four copies) not later than December 15, 1973 to

IFAC 1974,
Committee for Science, Technical Progress
and Higher Education,
8 Slavyanska Street,
Sofia, Bulgaria.

They will be notified late January/early February 1974. The deadline for the submission of full papers, also in the English language, is April 30, 1974.

The official languages during the Symposium will be English and Russian, and simultaneous translation will be provided.

Enquiries should be directed to the above address.

Systems Engineering Education in Developing Nations

This is the title of an IFAC Symposium which will be held in New Delhi, India, November 4 to 7, 1974 under the sponsorship of the IFAC Committees on Education and on Systems Engineering. The symposium which will be co-sponsored by the International Federation of Operational Research Societies (IFORS) is organized by The Institution of Engineers (India), the Indian National Member Organization of IFAC, with Brigadier *D. Swaroop* as Convener of the symposium.

The International Programme Committee for the symposium is chaired by Prof. *W. Findeisen* (Instytut Automatyki, Politechnika Warszawska, Warsaw, Poland), Vice-Chairman of the IFAC Committee on Education.

Papers are invited on topics listed below. Prospective authors should bear in mind that their papers have particular bias to education as relevant to systems engineering and that the problems discussed are such that they aid the developing nations in their technological progress.

- Scope, format and experience in teaching systems theory; applied systems analysis; dynamic modelling and simulation; mathematical programming; decision theory; control theory; computer-aided planning and management – to undergraduates and graduates in engineering, agriculture, environment, management, economy, rural and urban planning, political science etc.
- Curricula for interdisciplinary degrees in systems science and systems analysis as applicable to educational institutions in developing countries.
- Case studies of educational value and importance in systems of various kinds (industrial, environmental, natural resources, logistics, communications etc.).
- Methods of teaching exploited in systems education, comprising computer-aided and recorded instruction; team work of students; problem-oriented or technique-oriented teaching; development of vocational adaptability etc.
- Experience in continuing education in systems for people active in engineering, management, planning etc.

The deadline for the submission of English-language abstracts (of approximately 1000 words length) is November 15, 1973 and for the submission of full papers March 1, 1974. The working language for the symposium will be English; no simultaneous translation will be available.

Abstracts and all correspondence should be addressed to the Local Organizing Committee as follows:

Brig. *D. Swaroop*,
Convener, IFAC Symposium 1974,
The Institution of Engineers (India),
8 Gokhale Road,
Calcutta 700 020, India.

Systems Approaches to Developing Countries

Here is some information extracted from a comprehensive general report on the outcome of the IFAC/IFORS Conference on Systems Approaches to Developing Countries held in Algeria, May 28 to 31, 1973. About 360 participants from 25 countries enjoyed the excellent meeting facilities at the Palais des Nations, Club des Pins near Algiers. Technical papers were presented in parallel sessions divided in sections on 1) Management and development policies; agriculture and food; 2) Utilities; urban planning and industry; 3) Methodology; education and health; international cooperation and development. A survey report on "Applications of the System Approach in Development" was delivered by *G. B. Gresford*, the Director for Science and Technology of the United Nations Organization. The last day of the Conference was devoted to Round Table Discussions.

During the Conference several analysis methods of system engineering – defined as the application of scientific methods in integrating the planning, development and manufacture of complex systems – were presented and illustrated with various applications. These methods can be divided in two large categories.

- **Simulation methods,** allowing to replace experimentation often difficult, sometimes dangerous, on real systems, by tests on models allowing to predict the consequences of taking such or such option and further allowing to determine "a posteriori" the best solution.
- **Optimization "a priori" methods,** utilizing algorithms such as linear and dynamic programming, propositional calculus etc. allowing to define "a priori" the optimal solutions.

A number of times, the opinion was expressed that simulation methods were best for developing countries because of their more flexible and less abstract forms. Also is was expressed that one of their advantages was to lead to an analysis of the situation and a clearer formulation of the problem in terms of objectives to be pursued, of constraints to respect and of available means to utilize. This formulation alone was already fruitful and stimulated the imagination. In addition it offered a common basis of reflexion and communication for the teams concerned with the design and the implementation and operation of the studied systems.

In conclusion, the Conference proved that the development of a nation requires a multitude of choices to be made and options to be taken by its leaders. The "systems engineering approach" which permits responsible people in government and industry to acquire the necessary basic elements to facilitate, for example, the most efficient design and use of equipment of a plant or an industry, also enables the decision-maker to balance quantitative (economic and technical) considerations with qualitative (environment, quality of life and political option) criteria for the common good of his community. It was observed many times that each search of an optimal solution in a given sector is part of an optimization hierarchy that depends on national, and even international goals. One of the merits of systems engineering is to clearly show this hierarchy and to establish a common base of communication between the authorities and between those that are associated in one way or another for the purpose of reaching these goals.

The Conference has further shown that all countries are confronted with similar development problems, they all must take options on which their future will depend, all countries need the approaches of systems engineering and must take advantage of the experiences made elsewhere. Industrial countries have as much to learn from experiences made in developing countries than vice versa.

The proceedings of the Conference published by the Instrument Society of America are on the market at US $ 25 (details in Bull. No. 78).

Non-IFAC Events

- THE INTERNATIONAL FUTURE OF N/C CAM; Toronto, Canada, March 31 to April 3, 1974. Conference topics: NC programming and software development; DNC and CNC; NC system applications; Computer aided manufacturing; Maintenance for NC; NC graphics and data bases; Management aspects of NC. Further details available from: Mr. *William H. White*, Executive Director, Numerical Control Society, 524 St. Clair Ave., P.O.Box 138, Spring Lake, New Jersey 07762, USA.

- FUNCTIONAL ANALYSIS FOR ENGINEERS, a oneweek Vacation School arranged by the Control and Automation Division of the Institution of Electrical Engineers, London, UK, will take place from April 1 to 4, 1974 at the University of Oxford, with residential accommodation at St. Edmund Hall and lectures being held at the Department of Engineering Science. The main aim of the School is to introduce engineers, and particularly control engineers, the more important concepts and methods of functional analysis which find useful application in engineering. Attention is to be focused on methods of analysis and synthesis of control systems and whilst the results obtained via the proposed routes will not always be new, the conceptual strength of the functional analytic approach is to be emphasised. This approach is fundamental to the understanding of topics such as the stability and optimisation of linear and non-linear systems.

It is hoped that the School will provide a motivation for engineers and applied mathematicians to study this approach to systems analysis more deeply and it should certainly enable those interested to get a foothold on publications framed in functional analytic terms.

Notwithstanding these objectives, the approach to the subject matter will, as far as is possible, be through a conceptual framework which will be liberally reinforced by applications of the methods discussed.

Further details and application forms will be available in due course from the Secretary, Institution of Electrical Engineers, Savoy Place, London WC2R OBL, quoting reference LS (CA).

- The 1974 NATIONAL COMPUTER CONFERENCE & EXPOSITION, sponsored by the American Federation of Information Processing Societies and to be held in Chicago, Ill., USA, May 6 to 10, 1974, will explore all aspects of computer science and technology and its applications in a host of important user areas. General information obtainable from AFIPS HQ, 210 Summit Ave., Montvale, N.J. 07645, USA.

- Symposium on HYBRID COMPUTATION IN DYNAMIC SYSTEMS DESIGN; Rome, Italy, November 11 to 14, 1974; organized by the Association Internationale pour le Calcul Analogique (AICA) in cooperation with the International Federation for Information Processing (IFIP). The aim of the Symposium is to collect contributions on the use of the hybrid computation techniques in the design of dynamic systems in different fields (industrial, biological, ecological and socio-economical applications).
Topics: METHODS OF HYBRID COMPUTATION:
a) Identification, synthesis and optimization of industrial systems and other systems; b) Control of the large dynamic systems; c) Design and test of control systems using on-line computers; d) Operational procedures and training of human operators for complex engineering systems. APPLICATIONS: a) Electrical industry, nuclear industry, chemical industry, mechanical industry, steel and iron industry, aerospace systems; b) Biological systems, ecological systems, socioeconomical systems. Interested authors should contact Prof. *Alessandro De Carli*, Istituto di Automatica, Universita di Roma, 18 Via Eudossiana, 00184 Roma, Italy, for further details. Deadline for abstract submission: December 31, 1973.

IFAC Journal Automatica

Five years ago, commencing January 1969, Automatica was adopted by IFAC as its official journal, with *George S. Axelby* as editor and Pergamon Press Ltd. as publisher.

Automatica, well known and reputed throughout the world, covers theoretical and experimental research work and original development in the control of systems including all facets of automatic control theory; the design and characterization of components; practical applications; the effects of instrumentation and process characterization on control operations; the reliability of components and systems. Also included are papers on data processing for control purposes.

Automatica's close relationship with IFAC provides the basis of a broad perspective of control theory and practice, featuring contributions from many countries, and reports and papers from IFAC symposia. For example, in 1973, papers have been selected concerning the following

topics, mostly in new areas of systems development and control: Systems approaches to developing countries; Numerically controlled machine tools; Control in space; Ship and shipyard automation; Control of water resource systems; Control in mining, mineral and metal processing; Dynamic modelling and control of national economies; Automatic control in the glass industry; Identification and system parameter estimation; System sensitivity, adaptivity, and optimality; Control in physiological systems. In addition to publishing papers in these subjects, significant papers on other topics in control theory and application have been selected from papers which are being continuously submitted independently.

The forthcoming November 1973 issue will include papers concerning large scale systems, distributed parameter systems, Riccati equation solutions, non-linear programming, observers, F-M signal estimation, decoupling in non-linear systems etc.

The journal is published bi-monthly. Annual subscription rates for libraries, government departments, or industrial establishments £ 20 ($ 50.00); private individuals whose departmental libraries subscribe or who are attached to a member organization of IFAC, may obtain the journal for their personal use at a reduced rate of £ 3.50 ($ 9.00). If you wish to subscribe to Automatica please write to the publisher:

Pergamon Press Ltd., Headington Hill Hall, Oxford OX3 OBW, England.

The editor's address is:

George S. Axelby, Westinghouse Electric Corporation, Box 746 MS-452-A, Baltimore, Maryland 21203, USA.

IFAC Proceedings

- SHIP-OPERATION-AUTOMATION – The volume contains technical papers and survey lectures presented at the IFAC/IFIP Symposium on Ship-Operation-Automation, Oslo, Norway, July 2 to 5, 1973. The contributions of authors from 13 countries cover: topics on navigation, anticollision, steering of ships dealt with in sessions on bridge systems; topics on general systems design, diesel engines control systems, condition monitoring of diesel engines, steam-turbine automation systems and steam-turbine condition monitoring and control systems in sessions on engine room systems; topics on cargo handling on tankers, computer automation, software-reliability, reliabilty-fault finding, systems design in sessions on cargo handling and general systems; also a number of special topics. The majority of the papers is preceded by an abstract and an introduction. The contents list of the volume includes the names of the authors and their country affilation.

Edited by *Kjell Lind*, The Ship Research Institute of Norway. The book, softbound, illustrated, 530 pages, is available from *Kjell Lind*, The Ship Research Institute of Norway, 7034 Trondheim-NTH, Norway, at N.Kr. 200,– including postage. Orders should be sent together with cheques made payable to The Ship Research Institute of Norway.

- AUTOMATIC CONTROL AND COMPUTERS IN THE MEDICAL FIELD – A number of copies of the proceedings (abstracts and full papers) of this IFAC sponsored symposium held in Belgium, fall 1971, are still available and can now be obtained at a reduced price, namely 750.– Belgian Francs instead of 1.000.–, from IBRA, 3 rue Ravenstein, Brussels, Belgium.