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Council and Related Meetings 1991 Swansea, UK, July 15-19, 1991

The UK Council of Automatic Control, i.e. the UK NMO of IFAC, invited IFAC to hold its annual Council- and Related Meetings in Swansea, in conjunction with the IFAC Symposium on Computer Aided Design of Control Systems. As is usual on such occasions, most of the technical and all the administrative IFAC bodies will hold their meetings.

Looking through the material prepared for the meetings it is striking that there are a lot of new ideas and changes proposed. Especially a federation such as IFAC ought to meet the challenges posed by a rapidly changing world. The Federation representing an up-to-date science must be up to date in every respect.

One of the highlights of these days in Wales will be the Meeting of the International Program Committee for the World Congress in Sydney, 1993. The Chairmen of the IPC plan to cast the Congress Program into a brandnew shape. They propose to have Mini Symposia in six fields and to choose another eight so-called target areas. For the first time in IFAC history a poster session is proposed for a Congress. The number of presentations, planned to be at 900 for the Congress, will be significantly higher than in the previous congresses. A ten-volume preprint with 5.000 pages is going to be published. After the meeting in Swansea, we will know more about this new structure. We shall inform you about the decisions of the IPC in one of the next issues of the Newsletter.

Most of the large international federations, including also our sister federations, face certain difficulties in the management of their publications, because of the information boom of our days. IFAC publications are in good shape, but we have to be prepared to have good answers to the possible changes in our publications environment. That is why an ad hoc Journal Development Committee was established to look into these matters. Its report will be discussed in Swansea.

Another important subject for discussion is how to put an even greater stress on

technical matters in IFAC and to avoid a mistake that frequently happens in some other international organizations, i.e. to give too much weight to administrative and financial matters.

The Technical Board will certainly hold a lively discussion on the structure of the Technical Committees to adapt them to the newly emerging control fields. It is very difficult to decide how to optimize this process. Any delay is a disadvantage, because our Federation can lose its initiative role in international science. But a hasty reaction to the new fashions might lead into the wrong direction.

IFAC has to take into consideration the political changes taking place in the world as well. As a result of the changes and the economic difficulties in the former Eastern bloc countries, the number of no show authors from these countries has increased sharply. This is jeopardizing the technical program of many IFAC events. How could this problem be solved, how could the authors from developing countries, or rather countries with hard currency problems be helped? This is one very burning issue to be discussed in Swansea, knowing of course that IFAC alone cannot solve it.

One of the foundations of our Federation is the relationship with IFAC's National Member Organizations. A survey on this question was made by the Policy Committee and the results will be discussed in Swansea.

A new feature in the control field is the emergence of a number of regional Control Conferences with whom IFAC is starting to cooperate. An IFAC strategy regarding such types of cooperation will be one of the issues in the Technical Board Meeting.

As you can gather from this article, IFAC is really preparing for the 21st century. This can also be seen from the fact that representatives of countries that have so far applied for the 2002 Congress will have the opportunity to present their invitations to host the Congress.

Introducing IFAC Technical Committees and Working Groups IFAC TC on Manufacturing Technology Scope and Activities

Computer automated manufacturing is going to be a key factor behind the economic well-being for most of the countries. Research in this field will be funded from both national research budgets and from international cooperation programs. International research communities increasingly rely on the activities offered by MANTECH.

This Committee deals with information control issues that are associated with manufacturing processes and equipment, such as: material processing (metal removal, plastic forming), material handling, inspection, assembly, robotics, process oriented computer aided design and technological aspects of management information systems. The areas on system level include the design tools and production methods of the system plans and the complex control system of integrated manufacturing. On component level, the Committee concentrates on mechanics (kinematics and dynamics), motion control, applied AI, functional description of machine and complex object-oriented programming of manufacturing. Topics on equipment level include numerically controlled machines, robots, complex manufacturing systems, their supervision and maintenance, man-machine systems.

The Committee has formed two Working Groups on Intelligent Systems in Manufacturing, chaired by Jim Nevins (USA) and Control Architectures for Integrated

Working Groups of the TC on Manufacturing Technology

WG on Intelligent Systems in Manufacturing

Chairman: J.L. Nevins, USA

The purpose of this Working Group is as follows: To explore and to encourage the various IFAC TCs and Working Groups to explore the issue of an information-control approach to intelligent systems. This exploration has three main facets, namely: intelligent systems (from components to large complex systems including design systems as well as frameworks for enterprise integration), real time control of such systems, and application areas including industry, space, underwater and process control.

WG on Intelligent Autonomous Vehicles Joint Working Group of MANTECH and AEROSPACE

Chairman: C. Harris, UK

The scope of this Working Group is to address the development of generic system methodologies and technologies applicable to intelligent autonomous vehicles or robots used on land, at sea or in space.

The technical areas covered are as follows:

Manufacturing Activities and Enterprises chaired by Ted Williams (USA). Last year MANTECH and the Technical Committee on Aerospace proposed a joint Working Group on Intelligent Autonomous Vehicles, which was approved by the Technical Board. It is chaired by C.J. Harris (UK).

The MANTECH Committee sponsors two series of Symposia organized every three years. The next Symposium on Robot Control (SYROCO) will be held in Vienna, Austria, from 16-18 September, 1991, and the other on Information Control Problems in Manufacturing Technology will be organized in Toronto, Canada, from 25-28 May, 1992.

The following technical areas have been considered for future workshops on general tools for designing and implementing manufacturing systems: intelligent tools for manufacturing, design and implementation of methods for integrated systems, sensor based control in manufacturing, the use of AI techniques for the control of manufacturing operations, robots and smart sensors, vision systems and the application for quality control and monitoring, diagnostics and preventive maintenance.

Currently the Committee has 89 members from 31 countries. Its present chairman is Dr. Laszlo Nemes (Australia) who is helped by four vice-chairmen: Luis Basanez (Spain), Hyung Suck Cho (Korea), Ulrich Rembold (FRG) and Jack Scrimgeour (Canada)

- sensors and perception systems
 - sensor integration and multi-sensor data fusion
 - methods for task planning, task execution and verification of achievements (global and local) including fault management
 - navigation technology and methods
 - piloting and machine control systems
 - intelligent tele-operation and tele-existence systems
 - computer (HW/SW) architectures and methods for vehicle control
 - applications.
- The objectives of the Working Group are
- to provide an overview of the research directions in the field for IFAC members/newsletters/journals
 - to identify those technologies or research areas that are of fundamental importance to intelligent autonomous vehicles
 - to disseminate these considerations in publications, technical reports, workshops, symposia and congress contributions.

WG on Control Architectures for Integrating Manufacturing Activities and Enterprises

Chairman: Ted Williams, USA

More detailed information on this Working Group will be published in one of the forthcoming issues of the IFAC Newsletter.

News from NMOs Germany

The joint federation VDI/VDE-Gesellschaft Meß- und Automatisierungstechnik (GMA) of the two German Engineering Associations VDI (Verein Deutscher Ingenieure, more than 115.000 members) and VDE (Verband Deutscher Elektrotechniker, more than 33.500 members) was founded in 1973. On October 3, 1990, the unnatural separation of Germany into two parts was overcome. According to this new situation the leading councils of our federation and the WGMA - the national member organization of the former GDR - have agreed that from 1991 the VDI/VDE-GMA will represent the Federal Republic of Germany as the only scientific engineering organization within IFAC and IMEKO.

Right now the GMA represents more than 148.000 members in Germany including approximately 2000 members from the former GDR.

The GMA members elect the leading council of the GMA for a period of three years. At the moment the president is Professor Dr. M. Polke, Technical University Aachen; the scientific secretary is Mr. H. Wiefels.

The purpose of GMA is to promote technology and science of measurement and automatic control in both theory and application by information dissemination through congresses, symposia, etc. and/or publications in cooperation with other national and international organizations. The GMA is subdivided into 7 divisions:

- principles and theory
- methods of measurement/sensors
- devices and basic functions
- computer for automatic control systems
- operation of automatic control systems
- automatic control in power systems, chemical and other processes, power electronics, transportation, etc.
- dimensional metrology in manufacturing technology

The scientific and technical activities of the above mentioned divisions are accomplished in about 100 working groups which consist of 10-30 members each.

The German NMO has always been and will continue to be active in organizing technical events with IFAC sponsorship. The following events will be organized in the forthcoming period:

IFAC/IMACS Symposium on Fault Detection, Supervision and Safety for Technical Processes - SAFEPROCESS, 10-13 Sept., 1991, Baden-Baden
IFAC Symposium on Control of Power Plants and Power Systems, 9-11 March, 1992, Munich;
IFAC Symposium on Automatic Control in Aerospace, 8-11 Sept., 1992, Munich;
IFAC Workshop on Spacecraft Automation and On-Board Autonomy for Control of Missions in Space, 14-16 Sept., 1992, Darmstadt.
For 1993 already, an IFAC Workshop on Production Control to be held from 29-31 March is in its planning stage

Trends in Automatic Control

Distribution of Interests Points to Future Developments

The number of IFAC Affiliates is growing at an enormous rate. Currently more than 2,000 control engineers from 46 countries have been included into the Affiliate data base. The United States leads the list of Affiliates with 310 registrations, followed by China, P.R. with 218, the USSR with 173 and Germany with 153. Our mailing list also includes addresses in the Arabian Gulf, Albania, Iran and Nigeria.

The distribution of interests as represented by the keywords gives very valuable information for the Technical Board and for the meeting organizers.

The following table shows the number of persons interested in the various subject areas

Adaptive Control	998
Control Design	912
Computers in Control	871
Identification and Parameter Estimation	815
Artificial Intelligence	740
Nonlinear Systems	677
Computer Aided Design	637
Chemical Process Control	439
Large Scale Systems	435
Education	438
Man-Machine Systems	373
Distributed Systems	353
Distributed Parameter Systems	315
Modelling & Control of Non-Technical Systems	313
Manufacturing Technology	293
Aerospace	290
Economic and Management Systems	288
Biomedical Engineering and Control	261
Electric Power Systems	227
Components and Instruments	217
Social Effects of Automation	178
Biotechnology	157
Metallurgy, Mining and Mineral Processing	126
Marine Control	108
Agriculture	76

Almost 200 Affiliates are interested in additional subject areas. This list is headed by Robotics, followed by Discrete Event Systems. We hope that the Affiliate Date Base will be very useful both for the Affiliates and for those who plan the future of the Federation.

This Newsletter may be reproduced in whole or in part. We encourage reprinting in national and local automatic control periodicals. Acknowledgement to IFAC would be appreciated.

IFAC Workshop Computer Aided Systems Theory (EUROCAST'91) April 15-19, 1991 Krems, Austria

The field of "Computer Aided Systems Theory (CAST)" was introduced approximately 10 years ago and since that time it has grown to become an important part in the development of CAD tools. One of the main reasons for the feasibility of CAST systems is the rapid development of the workstation technology in hardware and software. Only this technology has made it possible to implement systems which "knows" systems theory as it is needed in engineering design activities for interactive use.

CAST systems allow for the designer the application of theoretical methods together with CAD implementation techniques. In control engineering such a theoretical approach has a long tradition and powerful commercial products already exist. In other fields such as chip design, microsystems design and computer architecture design a theoretical approach in the philosophy of CAST is rather new.

In the program of "EUROCAST'91" more than 90 lectures to CAST and related themes were presented. 4 invited lectures covered the state of the art from different points of view. The main topics of interest were in modelling methodology, artificial perception systems, systems theory (in the classical engineering

sense), control systems and artificial intelligence. Compared with the 1st Workshop 1989 in Las Palmas it can be stated that CAST research tends to stabilize to become a well defined field. The subject of Computer Aided Control Engineering was represented more than at the last event and gave an important contribution to EUROCAST'91. On the other hand the presence of computer designers and software specialists helped to bridge the gap between traditional engineering hardware concepts and modern engineering software implementations. The different titles of the more than 90 contributions showed that theoretic concepts are used more and more in practical applications.

In the well-known X-scheme of system design CAST software systems give support to the theory branch and contribute in an important way to the engineering, manufacturing and testing activities of the design process.

The approximately 120 participants from 90 different countries are looking forward to the next EUROCAST event, scheduled in February 1993 in Las Palmas, Canary Islands.

P. Kopacek, NOC Chairman
F. Pichler, General Chairman

IFAC Congratulates

Professor B.D.O. Anderson, President of IFAC, was awarded the title of Doctor Honoris Causa by the Catholic University Louvain, Belgium on May 3, 1991.

Professor Pieter Eykhoff, Editor-in-Chief of the IFAC Workshop Proceedings Series was awarded the title of Doctor Honoris Causa by the Free University of Brussels on 4 April, 1990. Further he received a recognition of honour from the Queen, i.e. the Knight in the Order of the Lions of the Netherlands, on 29 April, 1991.



Prof. Pieter Eykhoff

Professor Manfred Thoma, Advisor of IFAC, Chairman of the Publications Managing Board was awarded the degree Doctor of Science, Honoris Causa by the City University of London on 15 May, 1991.

New Communication Facilities at the IFAC Secretariat

As an important step towards the further development of communications facilities at the Secretariat an e-mail service has been established. The e-mail number of the Secretariat is

ifaca@tuvie.can.ac.at

The telex service at the Secretariat will be terminated as of 1 October, 1991. The decision to discontinue the telex service was considered at length but a study of the frequency and intensity of telex use showed that this communication service is practically fully replaced by telefax and e-mail.

The IFAC Secretariat will continue to closely observe developments in the communications sector to guarantee the best possible communication facilities.

Papers

Recursive Identification and Adaptive Precision of Wastewater Flows
(P.C. Tan, C.S. Berger, K.P. Dabke, R.G. Mein)

Nonlinear Averaging Analysis of the Incremental Pole Placement Adaptive Controller

(P.R. Barros, I.M.Y. Mareels)

Locally Robust Identification of Linear Systems Containing Unknown Gain Elements with Application to Adapted IIR Lattice Models
(G.A. Williamson, C.R. Johnson Jr., B.D.O. Anderson)

A Systolic Architecture for Iterative LQ Optimization
(L. Chisci, G. Zappa)

A Four-Block Problem for H_∞ Design: Properties and Applications
(M.J. Englehart, M.C. Smith)

Bicausal Representations and Multivariable Generalized Predictive Control
(B. Kouvaritakis, J.A. Rossiter)

A Robust Adaptive Stabilization of Discrete-Time First Order Systems
(A. Ilchmann)

An Information and Preference Theory Approach to a Discrete Resource Allocation Problem
(H.R. Rao)

Brief Papers

Laboratory Evaluation of Adaptive Controllers for Synchronous Generators
(Q.H. Wu, B.W. Hogg)

A MIMO Sliding Control with a First-Order Plus Integral Sliding Condition
(L-W. Chang)

Sliding Observers for Robot Manipulators

(C.C. de Wit, J.-J.E. Slotine)

Computer-Aided Design of Control Systems Using Non-Parametric Models
(J. Pan, J. Van de Vegte)

Directional Sensitivity Tradeoffs in Multivariable Feedback Systems
(V.R. Sule, V.V. Athani)

Linear Control Guaranteeing Stability of Uncertain Systems via Orthogonal Decomposition
(K. Gu, Y.H. Chen)

About Structural Controllability of Interconnected Dynamical Systems
(C. Rech, R. Perret)

Block Noninteracting Control with (Non)regular Static State Feedback: A Complete Solution
(J. Descusse)

Book Reviews

Multivariable Feedback Design, by J.M. Maceijowski
(H. Logemann)

Control of Partially Known Dynamical Systems, by A.A. Bahnasawi
(C.C. de Wit)

Proceedings of the 11th Triennial World Congress of IFAC

Tallinn, Estonia, USSR,
13–17 August, 1990

Automatic Control in the Service of Mankind
Editors: Ü. Jaaksoo, Institute of Cybernetics of the Estonian Academy of Sciences, Tallinn, Estonia, USSR
V.I. Utkin, Institute of Problems in Control, Moscow, USSR

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WHO IS WHO IN IFAC



Professor Azmi Kaya
Chairman of DECOM

Azmi Kaya is a professor of Mechanical Engineering and director of the Industrial Control and Automation Lab at the University of Akron, College of Engineering. Professor Kaya is a registered P.E. with graduate degrees from the University of Wisconsin (M.S.M.E.) and the University of Minnesota (M.S.E.E. and Ph.D.M.E.). His research interests are in energy, process control, and optimization by computer utilization. His experiences include Honeywell Inc. and Bailey Control Co. where he developed control and optimization techniques for digital computer applications in industrial process and energy management. He has worked as an expert for NATO and UN and consultant to industry including extensive training. Prof. Kaya has visited many countries worldwide and conducted work for improved energy efficiency and product quality. He also organized and conducted numerous workshops, seminars and symposia nationally and internationally. Prof. Kaya has conducted extensive research with over 110 refereed publications, 15 patents granted and 5 pending. He is a member of ASHRAE, ASME and senior member of IEEE and ISA. In IFAC Prof. Kaya holds the position of Chairman of the Technical Committee on Developing Countries.

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