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IFAC Council- and Related Meetings Málaga, Spain, 20 - 23 May, 1992

The Comité Español de la IFAC, the Spanish NMO of IFAC, invited our Federation to hold its annual Council- and Related Meetings in Málaga, in conjunction with the IFAC Symposium on Intelligent Components and Control - SICICA '92.

Before the Council Meeting on 23 May, the following IFAC bodies held their sessions: TC on Intelligent Components and Instruments, TC on Developing Countries, TC on Education, TC on Systems Engineering, TC on Theory, Administrative and Finance Committee, Awards Committee, Policy Committee, Publications Committee, Publications Managing Board, Automatica Editorial Board, Technical Board and Executive Board.

At the Council Meeting proper, the reports of the President, the Technical Board Chairman, the Executive Board Chairman, the Treasurer and the Secretary were all unanimously approved. So was the budget 1993, as presented by the Treasurer.

The President, B.D.O. Anderson, in his report, highlighted the changes that have taken place in the publications sector (see article on page 2) and invited Council members to suggest people from industry to serve on the Editorial Board of the new IFAC Journal 'Control Engineering Practice' (CEP).

The Technical Board Chairman, L. Ljung, reported on the agreements concluded with regional control conferences. The Council authorized the President to sign the agreement with the Latin American Control Conference and with the Asian Control Conference on behalf of IFAC.

Concerning the No-Show Author situation at IFAC events, the Council recommended that the Guidelines for Organizers should include the option of requesting partial or complete payment of the registration fee before the finalization of the program.

The TB Chairman also referred to the proposals and discussion that the Technical Board had held on potential changes of the TB structure. A task force was installed to prepare a detailed proposal for the Council.

The Council approved the composition of the Selection Committee for the Giorgio Quazza Medal, IFAC's highest award, consisting of K.J. Åström as Chairman, V. Kokotovic and I.Z. Tsytkin as members.

In the Closed Council Meeting a vote was taken, selecting one of four candidates for the 2002 IFAC Congress. The Chairman of the Elections Committee, Y.Z. Lu, announced that Barcelona, Spain had been selected to be the Congress site in 2002, with Pedro Albertos as President of IFAC for the 1999 - 2002 period. The Elections Committee then also submitted the preliminary list of candidates for the 1993 - 1996 triennium.

The Council was informed about the membership situation by Past President B. Tamm and the IFAC Secretary G. Hencsey. The change of membership for the Bulgarian NMO from the National Council of Automation to the Union for Automation & Informatics was approved. This change was made upon request of both organizations. A further application for membership had been received by the Union of Electrical Engineers of Estonia - UEEE to be accepted as Estonian National Member Organization of IFAC. All formal requirements having been fulfilled, the Council asked the Secretariat to carry out a postal ballot among the National Member Organizations concerning the approval of the UEEE as IFAC NMO. In addition, several other statements of interest in membership of IFAC have been received, e.g. from Russia to replace the former USSR NMO, from Egypt, Slovenia, Ukraine, Latvia, Bielorrussia, Georgia and Kirgisia. The Secretariat is in contact with the representatives of the respective organizations in these countries to assist them in preparing an application that is in line with the IFAC Constitution and By Laws.

The President Elect, Stephen Kahne reported on the positive development of the Affiliate Membership scheme (an article on this scheme was published in the last issue of the IFAC Newsletter). In the discussion on other possible forms of IFAC membership, B.D.O. Anderson stressed that developments must be monitored very carefully in the nearer future, as the political situation in the world is still in flux and further major changes may be expected.

The Council members discussed the items proposed for the draft agenda of the forthcoming General Assembly meeting that will take place in the framework of the IFAC World Congress in Sydney, Australia, July 1993.

B.D.O. Anderson, S. Kahne and Y.Z. Lu reported on the respective stages of preparation for the forthcoming IFAC World Congresses to be held in Sydney, Australia, 1993, San Francisco, USA, 1996 and Beijing, China, P.R., 1999.

During the Council Meeting in Málaga, representatives of the host NMO informed the participants about Spanish activities in control engineering and control engineering education.

The next Council- and Related Meeting will be held in Sydney, Australia, in conjunction with the IFAC World Congress.

In conclusion, the President thanked the Spanish hosts for the tremendous hospitality in providing the IFAC Council with all the facilities for holding its meetings.

New Publications Program

Since 1976 IFAC has been working with Pergamon Press to develop and operate the IFAC Publications program. The program was formalized in two contracts with Pergamon Press, one for AUTOMATICA (which actually began in the late 1960's) and one for the publication of Proceedings of IFAC Symposia and Workshops. This program has proven to be very successful as a service to the control community and a source of income to IFAC. The direct effect of the income stream from this activity is that IFAC has been able to provide numerous services to its National Member Organizations (NMOs) without charging large annual fees for NMO membership in IFAC. Over these years the key committees involved with IFAC publications have been the IFAC Publications Committee, the IFAC Publications Managing Board (joint between IFAC and Pergamon Press), and the AUTOMATICA Editorial Board. In addition to these committees there have been a number of key IFAC positions which have provided leadership for various parts of the program. These include the chairmen of the committees listed above plus the IFAC Symposium Editor-in-Chief and the IFAC Workshop Editor-in-Chief. All these publications entities and leaders have reported to the Council through the Executive Board.

Over the years we have seen market conditions change and have observed changes in the way the publications activities have evolved. In the early 1980's a careful review of the publications business was led by Professor Pieter Eykhoff (NL) and minor adjustments were made. Then, in 1990, a series of new studies were undertaken to see if there were ways to improve the overall program with special attention to the quality of service it provides to the authors of IFAC papers, the NMOs and the control community in general. Two years of study and development of alternatives have now resulted in significant changes in the way we are doing our publications business. This article reports on the general changes. Detailed information will soon be made available to conference organizers, authors, and others.

The major changes include termination of the IFAC Proceedings series. Market forces have made this series impossible to justify. Authors of papers in IFAC conferences deserve to have their papers widely available to the control community. Proceedings volumes, which have been the only source of these papers which could be obtained by other than attendees at a conference, have not been selling well and are becoming more difficult to find in the world's libraries. This was one of the main drivers which led us to change the publications policies of IFAC. Beginning in January 1993, IFAC Proceedings will no longer be published. In its place IFAC will make available Preprints of IFAC Symposia and most Workshops through the IFAC Publisher - Pergamon Press. The distribution of Preprints by the organizers remains limited to meeting participants but IFAC Publications will purchase from conference organizers a specified number of Preprint volumes for resale. The conference organizers will be guaranteed a net surplus on their preprint run-on costs by the price paid by IFAC Publications and will for the first time be able to count on income from their conference publications. Also, IFAC will begin a new journal in 1993. Control Engineering Practice (CEP) will be led by a newly named Editor-in-Chief, Professor Michael Rodd of the University of Swansea, Wales, UK. He is in the process of

assembling a world-wide editorial board for this new journal which will focus on papers from IFAC conferences which have an applications component. In addition, the journal will provide an abstracting and indexing service for papers in all IFAC meetings. Like AUTOMATICA, it will be available at a reduced subscription price to IFAC Affiliates.

The Editors-in-Chief of AUTOMATICA and of CEP, George Axelby and Michael Rodd will cooperate in selecting papers from the IFAC conferences which are appropriate for each journal. In addition, IFAC will establish special relations with a number of existing control journals which will be designated IFAC Affiliated Journals and which will have access to papers not sought by AUTOMATICA or CEP. Our goal is to move from the present situation in which the IFAC journal AUTOMATICA accepts only about 3 % of all papers appearing in preprint volumes of IFAC conferences, to a position in which between 25 % and 50 % of all IFAC conference papers will appear in one of the IFAC journals or an Affiliated Journal. Thus, three major improvements in service are achieved by these changes: Lower cost archival volumes (Preprints rather than Proceedings) available to libraries and individuals directly from IFAC Publications, income to organizers, and IFAC journal publications outlets for others. The business aspects of this new program are formalized in a contract IFAC has negotiated with Pergamon Press. Financial terms are favourable to IFAC compared with the previous situation. The IFAC Publications Managing Board remains as the key joint committee to supervise the business aspects of this operation.

Of course, changes such as those described above require changes in various IFAC publications, documents and procedures. Those changes are being made as quickly as possible in order to minimize the disruption for organizers currently preparing IFAC technical events. In the meantime all commitments to organizers will be kept unless they choose to immediately adopt the new procedure. Any questions about these publications procedures may be directed to the IFAC Secretariat.

Such substantial changes in the complex business of publications required the volunteer efforts of many people. We would like to mention several of them here, even though we face the danger of not being complete in this listing.

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Professor Manfred Thoma (D) - Chairman of the IFAC Publications Managing Board (PUMB), Professor Janos Gertler (USA) - Editor-in-Chief of the the IFAC Symposia Proceedings Series, Professor Pieter Eykhoff (NL) - Editor-in-Chief of the Workshop Proceedings Series, Professor Guido Guardabassi (I) - Chairman of the IFAC Publications Committee, Mr. George Axelby (USA) - Editor-in-Chief of AUTOMATICA, Professor Michael Rodd (UK) - Editor-in-Chief of Control Engineering Practice, Professor Huibert Kwakernaak (NL) - Deputy Editor-in-Chief of AUTOMATICA, and Professor John Coales (UK) - former Chairman of PUMB and former IFAC President. In addition to these gentlemen, Michael Dawes of Pergamon Press worked closely with us in the negotiation of the contract which now governs this complex relationship between IFAC and Pergamon. The foundations have been laid for an even more successful IFAC publications activity. With good support from the IFAC Technical Board which oversees IFAC technical events, we can look forward to a healthy future for IFAC technical meetings and publications.

Brian D.O. Anderson, President
Stephen Kahne, President-Elect

EDCOM Software Exchange

A software exhibition and exchange will be organized during the upcoming World Congress of IFAC in Sydney.

Interested contributors are invited to contact

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until the end of the year.

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.

Intelligent Components and Instruments for Control Applications

SICICA '92

IFAC Symposium

Málaga, Spain, May 20 - 22, 1992

The Symposium was the first of a series sponsored by the Working Group on Intelligent Components and Instruments of the IFAC Components and Instruments Technical Committee. SICICA '92 was co-sponsored by the IFAC Technical Committees on Applications, Computers, Education and Systems Engineering. The annual IFAC Council and Related Meetings was held in conjunction with SICICA '92.

The objective of the Symposium was to bring together control systems specialists, equipment manufacturers and end-users, to evaluate techniques, components, and instruments for intelligent control.

Intelligent Control is an emerging field involving new control techniques as well as new smart controllers, sensors and actuators. Software and hardware components to implement advanced control strategies and intelligent functions such as reasoning, learning, and perception, are usually considered in the intelligent control domain. The development of these control techniques has an influence on a great number of applications including Robotics and Process Control.

The success of SICICA '92 was due to the interesting technical program, the IFAC support, and the collaboration of many people and local institutions in supporting the organization.

The International Program Committee was composed of 24 specialists from 17 countries, chaired by Professor Pedro Albertos, Chairman of the IFAC Technical Committee on Components and Instruments.

The final program of the Symposium included six Plenary Sessions, one Invited Session, and 20 Sessions with 132 papers selected by the International Program Committee from the 230 extended abstracts submitted. Authors from 30 different countries have contributed to the Symposium.

The Plenary Sessions were devoted to Information Processing Systems in Sensing Devices and Microsystems, by H.R. Trankler, Intelligent Actuators, by R. Isermann and U. Raab, Intelligent Controller Issues, by P. Albertos and co-workers, Field Robots Technology and Applications, by W. Whittaker, Intelligent Estimation and Prediction for Systems Control and Decisions, and Intelligent Control Theory and Applications, by A.J. Krijgsman, H.B. Verbruggen, and M.G. Rodd.

The Technical Sessions covered intelligent control techniques (fuzzy control, neural networks, qualitative methods, learning, expert systems for control), actuators, sensors, image processing, computer vision, software and communications.

About one third of the program was devoted to

the applications including robotics (arms and mobile robots), power and process control, manufacturing, aerospace and traffic control.

IFAC was represented at the highest level at SICICA '92 by its President, Professor B.D.O. Anderson, who participated in the opening session. Professor G. Ferraté, President of the IFAC Spanish NMO, also participated in this session.

The Symposium was held in the Hotel Alay, located in Benalmádena, one of the villages of the Costa del Sol by the Mediterranean Sea in southern Spain, 12 km west of Málaga and less than a 10 minute drive from the Málaga International Airport. The Hotel Alay is located near the beach and the Puerto Marina yacht harbour, and offered all the facilities required for the Symposium and the meetings of the IFAC Council, Committees and Working Groups.

About 200 persons from 25 different countries attended the Symposium. The attendees came from universities, R&D institutes, industries and engineering companies. About 70 participants were from Spain.

The IFAC Symposium on Intelligent Components and Instruments for Control Applications was very successful. It is believed that the participants enjoyed the technical program and the organization of SICICA '92.

A. Ollero, NOC Chairman

Information Control Problems in Manufacturing Technology - INCOM

7th IFAC Symposium

Toronto, Canada, May 25-28, 1992

INCOM '92, the seventh in the series of IFAC Symposia on control problems in manufacturing technology, sponsored in a regular three-year cycle by the IFAC Technical Committee on Manufacturing Technology, was held in Toronto, Canada, in May.

With its focus on information and control problems in manufacturing technology, the INCOM Symposia series is concerned with the very heart of the vast changes that are occurring worldwide in manufacturing technology and as such is IFAC's principal event in this area of great importance.

The technical program contained 112 papers selected after review from the 186 submitted papers. These numbers are an indication of the growing importance of manufacturing technology, the amount of research being conducted worldwide in this area and of IFAC's growing involvement in this application area.

Session topics included

- Simulation of Manufacturing Processes
- Control Problems
- System Management
- AI and Expert Systems in Manufacturing
- Information Systems for Manufacturing
- Sensor Based Robots in Manufacturing
- Advanced Applications and Case Studies
- General Aspects of Computer Integrated Manufacturing
- Manufacturing Networks

Four technical sessions each were held in parallel to allow adequate time for presentation and discussion, but in facilities that gave attendees the opportunity to move conveniently between sessions if so desired.

In addition, seven invited speakers presented papers of broad and general interest in the plenary sessions on each of the four days of the symposium.

- Dr. Mark S. Fox, of the University of Toronto, and formerly of Carnegie Mellon University, described the need for, and work in, integrated enterprise modelling.

- A paper by Prof. F. Joavane, presented by Prof. F. Nicolo of the University of Rome, described the European Community Programmes in collaborative research and development. Emphasis was on the EUREKA initiative which now contains some 470 projects involving 2625 participants, 1694 companies and a total project value of approximately 8300MECU (USD 10 billion), much of which is directly related to manufacturing.

- M. Koroniak from the Canadian federal government and Dr. V. Thomson of the National Research Council in Canada provided an overview of the Intelligent Manufacturing Systems project, as proposed by Japan, in which five countries

or areas are now participating, namely: Japan, the USA, Europe, Canada and Australia.

- Dr. L. Nemes from Australia, Chairman of the IFAC Manufacturing Technology Committee, summarized the history of design and manufacturing which has led to the current concept of manufacturing systems engineering. Reference architectures were discussed, including the work of the joint IFAC/IFIP task force, established in 1990 to undertake a comparative analysis of existing models, with a report to be presented at the IFAC World Congress in Sydney, in 1993.

- Dr. G. Allan, President of the Manufacturing Research Corporation of Ontario (MRCO), described the work of that organization. MRCO stimulated world class industrial research at six Ontario universities and the linkage of that research to industry. MRCO currently funds approximately 50 projects involving 30 researchers in the four theme areas of Automation, Design, Management and Processes.

- Mr. W. Noxon of the Eastman Kodak Company in Rochester, New York, presented a case history in modern design methods using

Editorial

Lyapunov Centenary
(G.S. Axelby, P.C. Parks)

Papers

Alexander Mikhailovitch Lyapunov: On the Centenary of His Doctoral Dissertation on Stability of Motion
(P.S. Shcherbakov)

Modelling and Adaptive Control of Nonlinear Distributed Parameter Bioreactors via Orthogonal Collocation
(D. Dochain, J.P. Babary, N.Tali-Maamar)

Convergence Characteristics of a Maximum Likelihood Load Model Identification Scheme
(S. Kamoun, R. Malhamé)

A New Algorithm for L₂ Optimal Model Reduction
(J.T. Spanos, M.H. Milman, D.L. Mingori)

A New Robust MRAC Using Variable-Structure Design for Relative-Degree-Two Plants
(L-C. Fu)

Fast Algorithm of Chandrasekhar Type for ARMA Model Identification
(X.C. Du, A. Brelia, R. Longchamp)

Discrete-Time Pole Placement with Stable Controller
(M. Kinnaert, V. Blondel)

A Unified Approach for the Stability Robustness of Polynomials in a Convex Set
(L. Qiu, E.J. Davison)

Brief Papers

Classification of Fruits by a Boltzmann Perceptron Neural Network
(U. Ben-Hanan, K. Peleg, P-O. Gutman)

On the Adaptive Control of Flexible Joint Robots
(Y-Z. Chang, R.W. Daniel)

A Nonlinear Control Design for Power Systems
(L. Gao, L. Chen, Y. Fan, H. Ma)

A Homotopy Approach for Stabilizing Single-Input Systems with Control Structure Constraints
(M.S. Phatak, S.S. Keerthi)

Simple Frequency-Dependent Tools for Control System Analysis, Structure Selection and Design
(M. Hovd, S. Skogestad)

A Methodology for Sequential Design of Robust Decentralized Control Systems
(M-S. Chiu, Y. Arkun)

Design of MIMO Compensators for Systems with Unmeasurable Disturbances: The Polynomial Approach
(P. Hippe)

Identification of the Barycentric Parameters of Robot Manipulators from External Measurements
(B. Raucent, C. Campion, B. Bastin, J.C. Samin, P.Y. Willems)

Synthesis of Uncertain MIMO Feedback Systems for Gain and Phase Margin at Different Channel Breaking Points
(O. Yaniv)

The Sensor Noise Problem in Dithered Feedback Systems
(S. Oldak, I. Horowitz, A. Shapiro)

A Comparison of Five Algorithms for the Training of CMAC Memories for Learning Control Systems
(P.C. Parks, J. Millitzer)

Output Regulation of Strongly Coupled Symmetric Composite Systems
(X. Liu)

Controllability of Bilinear Systems
(U. Piechotka, P.M. Frank)

Delay Structure Conditions for Identifiability of Closed Loop Systems
(P.M.J. Van den Hof, D.K. de Vries, P. Schoen)

On Blocking Zeros and Strong Stabilizability of Linear Multivariable Systems
(B.M. Chen, A. Saberi, P. Sannuti)

Global Stabilization of a Class of Quadratic Systems
(S. Samba, J.C. Vivalda)

Book Reviews

Real Time Microcomputer Control of Industrial Processes, by S. Tzafestas and J.K. Pal
(P.K. Sinha)

Optimal Control: Linear Quadratic Methods, by B.D.O. Anderson and J.B. Moore
(V. Kucera)

System Identification, by T. Söderström and P. Stoica
(H.G. Natke)

Weak Convergence Methods and Singular Perturbed Stochastic Control and Filtering Problems, by H.J. Kushner
(V.S. Borkar)

Phase Portraits of Control Dynamical Systems, by A.G. Butkovskiy
(H. Nijmeijer)

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three-dimensional CAD and a concurrent engineering design philosophy. The project described resulted in the highly successful design, and transfer to manufacture, of the company's current product line of single use cameras.

- Mr. R. Maitel, Vice President of Technology Transfer and Business Development at the Saskatchewan Research Council, described a series of studies in several countries on company's needs in manufacturing technology. While great attention is generally put on research and development, it is found that a similar need exists to create new mechanisms for encouraging the adoption of technologies already available, on both a sectoral and individual company basis.

In summary it can be said that the objective of organizing an international symposium of high quality was achieved. From the 186 papers submitted, 112 were accepted following review and 111 of these were included in the preprints distributed to all attendees. In addition, the seven invited speakers for the plenary sessions presented highly informative talks which complemented the more research oriented technical papers presented in the four parallel sessions. From comments received, we believe that INCOM '92 was considered by all attendees to be a highly successful event. The Proceedings of the symposium containing all technical papers presented will be published by Pergamon Press.

J. Scrimgeour
NOC Chairman

WHO IS WHO IN IFAC



Prof. A. Benveniste
Chairman TC on Theory

Albert Benveniste was born in May, 1949 in Paris, France. In 1971 he graduated from the Ecole des Mines de Paris. He wrote his Thèse d'Etat in mathematics, probability theory, at the University of Paris VI, Jussieu, in 1975, with Paul-André Meyer being his doctor father. From 1976 to 1979 he was Associate Professor of Mathematics at the University of Rennes I. From 1979 on he has been Director of Research at INRIA.

From 1970 to 1978, Albert Benveniste worked on probability theory and stochastic processes, and more specifically on Markov processes (where he introduced the notion of a Levy system jointly with J. Jacod) and Continuous Time Ergodic Theory, where he provided conditions for filtered continuous time dynamical systems to be embedded in or isomorphic to the flow of Brownian motion.

In parallel, Albert Benveniste pursued work on automatic control and signal processing in the area of adaptive systems. Together with M. Goursat and G. Ruget, Albert Benveniste derived new convergence theorems for recursive stochastic algorithms with dependent and discontinuous random vector fields. This theorem was applied to analyze blind deconvolution in data communications. Then Albert Benveniste proposed a new asymptotic framework to study permanent learning of adaptive algorithms when the true system is varying with time. A joint book with M. Métivier and P. Priouret was written on adaptive algorithms that summarizes the above work. In 1980 Albert Benveniste began joint work with Michèle Basseville on the subject of change detection in signals and dynamical systems. In particular, he derived a general method to associate to any identification procedure a change detection procedure. This general method was successfully applied to vibration monitoring.

Since 1981 Albert Benveniste has been interested in computer science, in the area of real-time languages and systems. Cooperating with P. Le Guernic, he participated in the definition of and theoretical studies on the SIGNAL language.

Since 1987, Albert Benveniste, together with A.S. Willsky from M.I.T., has been involved in developing a statistical theory of multiresolution signal and image processing, based on dynamical systems and Gaussian random fields on homogeneous trees.

In 1980, Albert Benveniste was co-winner of the IEEE Transactions on Automatic Control Best Transaction Paper Award for his paper on blind deconvolution. In 1990 he received the CNRS silver medal and in 1991 he was elected IEEE fellow. From 1986 to 1990 he was Vice Chairman of the IFAC Committee on Theory and is now Chairman of this Committee for 1991-1993. From 1987 to 1990 he was Associate Editor for IEEE Transactions on Automatic Control. He is currently Associate Editor for the International Journal of Adaptive Control and Signal Processing, the International Journal of Discrete Event Dynamical Systems and Associate Editor at Large for IEEE Transactions on Automatic Control. He has coauthored with M. Métivier and P. Priouret the book 'Adaptive Algorithms and Stochastic Approximations', and has been an editor, jointly with Michèle Basseville of the collective monograph 'Detection of Abrupt Changes in Signals and Systems'.