IFAC International Federation of Automatic Control
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Newsletter

Contents:

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United Nations, Economic Commission for Europe (UN-ECE)

Working Party on Engineering Industries and Automation

In the course of the activity to assess the developments in the diffusion of automation and their techno-sociological aspects on the various branches of the economy, the Working Party on Engineering Industries and Automation recently organized an ad hoc meeting in the United Nations building in Geneva, to deal with Production and Use of Industrial Robots.

Dr. Cuénod attended the meeting on behalf of IFAC and summarizes below some of the conclusions.

The introduction of micro-electronics into robot control has significantly improved the flexibility and reliability of the robot operation itself and also their synchronization and co-ordination with other types of automation such as numerically-controlled (NC) machine tools, automated handling equipment, computer aided design (CAD), etc. The applications for semi-conductor technology have greatly expanded, annual market growth rates averaging 25 per cent.

As an example of advancing technological sophistication one can compare some five logic circuits placed on a semiconductor device in the late 1960s, with 100 circuits per device in the mid 1970s and 1500 circuits per device at present. At the same time, the number of bits per one semiconductor chip increased from 1,000 in 1970 to 256,000 in 1980 (the forecast for 1985 is 1 million bits) and the price per bit in US cents decreased from 0.1 in 1970 to 0.005 in 1980 (the forecast for 1985 is 0.002 US cents per bit).

A considerable part of the meeting was devoted to the definition and classification of robots. The following definition proposed by the International Organization for Standardization (ISO) was accepted:

"The industrial robot is an automatic position-controlled reprogrammable multifunctional manipulator, having several axes (degrees of freedom) capable of handling materials, parts, tools, or specialized devices through variable programmed motions for the performance of a variety of tasks."

According to statistics compiled by the Robot Institute of America, the number of variable sequence robots operating in Japan is about 14,000 as compared with 3,000 in the U.S. and 850 in West Germany. The number of more sophisticated robots operating in Japan is about 3,000, followed by 2,155 in the U.S. and 450 in West Germany. If the term "Robot" is given a slightly wider definition as adopted by the Japan Industrial Robot Association, there are some 70,000 or 80,000 industrial robots operating in Japan. In any case, Japan's share of industrial robots amounts to approximately 60 to 70 percent of the world's total robot population.

The introduction of robots into manufacturing processes poses difficult technical, organisational and social problems such as

- technological innovation including high-speed and continuous manufacturing (2 or 3 shifts), improvement of quality, reliability of manufacturing process etc.;
- increase of the economic efficiency of production including higher productivity, material savings, lower labour costs, etc. It is expected that an average programmable robot may save from 2 to 3 skilled workers carrying out simple repetitive operations;
- various social problems such as the replacement of hazardous and physically and mentally demanding and tiring jobs, allowing the transfer of workers and operators to more convenient and skilled jobs.

The importance of the exchange of informations on government measures to promote and encourage robot development and installation, and on methods of economic justification for the introduction of robots was underlined.

The next meeting for the study on production and use of industrial robots is planned for November 1983. As an organization accredited to the UN, IFAC, through its delegate, can participate in the UN meetings related to IFAC activity, consult the UN Secretariat, receive working documentation and also put forward certain IFAC ideas to the attention of the UN Organizations.

Further information concerning these activities and meetings can be obtained from

Dr. Michel Cuénod, IFAC Advisor
7 place Claparède
1205 Geneva, Switzerland.

FORTHCOMING EVENTS

This list has been brought up to date in accordance with decisions taken by the meeting of the Technical Board on September 28/29, 1982 in Baden-Baden.

Title	1983	Place	Deadlines	Further Information
IMACS/IFAC Int'l Symposium Simulation in Engineering Sciences	May 9—11	Nantes, France	—	A.F.C.E.T. IMACS Symposium 1983 156, Bd. Péreire 75017 Paris, France
5th IFAC Workshop Distributed Computer Control Systems	May 18—20	Sabi-Sabi Game Reserve South Africa	—	Prof. M. G. Rodd University of the Witwatersrand 1 Jan Smuts Avenue, Johannesburg, South Africa
IFAC Workshop Management Control Systems Modelling of Dynamics	May 3—6	Dubrovnik, YU	—	Dr. Rajkov Faculty of Organizational Sciences/ University of Belgrade Jove Ilica 154 11000 Beograd, Yugoslavia
AFCET/IFAC/IFIP Symposium New Techniques and Ergonomics	May 31— June 2	Valenciennes, F	—	University of Valenciennes Le Mont Houy 59326 Valenciennes, Cedex France
IFAC/IFIP Conference Training for Tomorrow: Educational Aspects of Computerized Automation	June 7—10	Leiden, NL	—	Mr. L. Immink c/o Twente University of Technology Dept. C.T., P. O. Box 217 NL-7500 AE Enschede, The Netherlands
4th IFAC/IFORS Conference The Modelling and Control of National Economies	June 17—19	Washington D.C., USA	—	Dr. M. Canzoneri 4th IFAC/IFORS Conf. Board of Governors, Federal Reserve Washington DC 20551, USA
IFAC Workshop Applications of Nonlinear Programming to Optimization and Control	June 20—22	San Francisco, USA	—	Prof. H. E. Rauch Lockheed 52-56/205 3251 Hanover Street Palo Alto CA 94304, USA
IFAC Workshop Adaptive Systems in Control and Signal Processing	June 20—22	San Francisco, USA	—	Mr. D. M. Auslander University of California Mechanical Eng. Dept. Berkeley, CA 94720, USA
3rd IFAC/IFORS Symposium Large Scale Systems: Theory and Applications	July 11—15	Warsaw, Poland	—	Dr. Z. Nahorski 3rd IFAC/IFORS LSSTA Systems Research Institute Polish Academy of Sciences ul. Newelska 6, 01-447 Warsaw, Poland
World Conference on Systems	July 11—15	Caracas, YV	—	Organizing Committee 1983 World Conference on Systems Fundasistemas Apartado Postal 47570 Caracas—1041a, Venezuela
IFAC/IFIP/IFORS Symposium Fuzzy Information, Knowledge Representation and Decision Processes	July 19—21	Marseille, France	—	Prof. M. Roux Laboratoire de Biomathématique Faculté de Médicine 27, Blvd. Jeon-Moulin F-13385 Marseille, Cedex 5, France
4th IFAC Symposium Mining, Mineral and Metal Processing	August 22—25	Helsinki, SF	—	IFAC 4th MMM Symposium 1983 Secretariat P. O. Box 192 SF-101 Helsinki 10, Finland
IFAC Workshop Simulation and Validation Techniques to establish Control System Performance	August 22—26	Stanford, Univ., USA	—	Prof. D. B. DeBra Dept. Aero & Astro Stanford University Stanford CA 94305, USA

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FORTHCOMING EVENTS (ctd.)

Title	1983	Place	Deadlines	Further Information
3rd IFAC Symposium Control in Power Electronics and Electrical Drives	Sept. 12—14	Lausanne, CH	—	Prof. H. Bühler Ecole Polytechnique Fédérale de Lausanne Laboratoire d'électronique industrielle 16, ch. de Bellerive CH-1007 Lausanne, Switzerland
IFAC Workshop Supplemental Ways of Improving International Stability (SWIIS)	Sept. 13—15	Laxenburg, A	—	Ö P W Z, „SWIIS 1983" P. O. Box 131 Hohenstaufengasse 3 A-1014 Vienna, Austria
3rd IFAC Workshop Safety of Computer Control Systems SAFECOMP 83	Sept. 20—22	Cambridge, UK	—	Miss R. da Gama Computing and Control Division, IEE Savoy Place London WC2R OBL, UK
IFAC Workshop Modelling and Control of Electric Power Plants	Sept. 22—23	Como, Italy	—	Prof. C. Maffezzoni Politecnico di Milano Senior Researcher at ENEL Via Valv. Peroni, 77 I-20133 Milano, Italy
CIGRE/IFAC Symposium Control Applications for Power System Security	Sept. 26—28	Florence, Italy	—	CIGRE/IFAC Symposium Central Office of CIGRE 112 bd Haussmann F-75008 Paris
IFAC Symposium Automatic Control in Chemical Processing and Extraction Metallurgy	Sept. 26—30	Pretoria, South Africa	—	The Symposium Secretariat IFAC Symposium S. 282 Council for Scientific and Industrial Research P. O. Box 395 Pretoria 0001 Rep. of South Africa
IFAC Symposium Artificial Intelligence in Manufacturing	October 4—6	Leningrad, SU	—	Prof. V. M. Ponomaryov LRCC USSR AOS 1, Mendeleyevskaya Line Leningrad, 199164, USSR
5th IFAC/IMEKO Conference Instrumentation and Automation in the Paper, Rubber, Plastics and Polymerisation Industries (PRP automation 5)	October 11—13	Antwerp, B	—	PRP Automation 5 Jan van Rijswijcklaan 58 B-2000 Antwerp, Belgium
IFAC Symposium Components and Instruments for Low Cost Automation and Applications	Oct. 17—21	Varna, BG	—	Dr. L. Lazarov/Vice-President National Centre for Cybernetics and Computer Techniques State Committee for Science and Technical Progress 8, Slavianska Street, Sofia, Bulgaria
IFAC Workshop Design of Work in Automated Manufacturing Systems (with special reference to small and medium sized firms)	Nov. 2—4	Karlsruhe, FRG	—	Mr. H. Wiefels VDI/VDE GMR Postfach 1139 D-4000 Düsseldorf, FRG
IFAC Workshop Human Gait Analysis and Applications	Nov. 24—27	Montpellier, F	—	Prof. P. Rabischong Unité de Recherches Biomécaniques, INSERM 395, Avenue des Moulins F-34000 Montpellier, France
IFAC Workshop Systems Engineering in Control Engineering	Dec. 12—14	Noord-wijkerhout, NL	—	H. Feikema Foundation for Post-Degree Education in Control Engineering Lorentzweg 1 NL-2628 CJ Delft, Netherlands
9th World Congress	**1984 July 2—6**	**Budapest, H**	**draft paper July 1, 1983**	**Computer and Automation Institute Hungarian Academy of Sciences P. O. Box 63 H-1502 Budapest, Hungary**

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Analysis, Design, and Evaluation of Man-Machine Systems

The First International Conference on Man-Machine-Systems (MMS), held at Baden-Baden (FRG), in September 1982, was centered around three key-words: Analysis, Design and Evaluation. These keywords represent different ways of looking at man-machine systems (MMS) which, in a way, complement each other.

A man-machine system is defined as a functional synthesis between a biological/-psychological/social system (the man or a group of people) and a technological system (the machine) characterized predominantly by the interaction and functional interdependence between these two.

The conference was initiated and sponsored by the IFAC Committees on

— Systems Engineering
— Social Effects of Automation
— Economic and Management Systems.

It was co-sponsored by

— International Federation for Information Processing (IFIP)
— International Federation of Operational Research Societies (IFORS)
— International Ergonomics Association (IEA)

More than 200 participants from 25 countries attended this conference. Out of 114 submitted papers the International Program Committee had selected 54, the authors coming from 15 countries. In addition, five invited papers were presented.

Compared to the "machine" relatively little is known about "man" in the MMS. Hence, analysis is directed to modelling human behaviour, in order to arrive at a complete system model.

In fact, every man-machine-system links two extremely contradictory structures. The computer for example is an artificially created, formalized system with stable features. Man, on the other hand, is a natural, non-formalized system. He is never stable, he changes as long as he lives.

A computer can be described completely by drawings, figures and wiring diagrams. Should you try to describe a human being the same way, you will soon find out that the more copious and detailed the description becomes, the less it will provide a picture of the personality.

Any machine offers a certain amount of perfectionism in its particular field but because of that quality is incapable of creativity. Man, on the other hand, is by definition not perfect, faulty, makes mistakes, but this is the supposition to his creativity.

The classic computer, operating strictly by logical rules, will amplify human intelligence, but it will equally amplify human un-intelligence.

While the machine will render best results if it is adept at applying a strict and well-defined routine, man has to be given space for applying his own discretion wherever this is possible.

During a round table discussion in Baden-Baden some aspects became clear: there is a great difference between cases where realistic system simulation is possible during the design phase (as, e.g., in electric power generation), and where this is impossible due to cost and/or time limitations (as, e.g., often in the chemical industry). Another difference exists between cases where the system can be shut down if there is a failure (as, e.g., in rolling mills), and cases where the operators have to keep the system going (as, e.g., in blast furnaces and airplanes). It is very desirable to investigate these differences in more detail.

Man-machine systems cannot be considered in a completely neutral way. Points of view vary widely, depending on how one approaches the human being in the system.

One extreme is to consider him/her simply as a system component, with its inherent characteristics and limitations. The other extreme is to deny the possibility of man-machine system studies altogether. Man should freely decide how to interact with the machine and interference by others is an undesirable attack on his/her autonomy.

Intermediate positions are also represented: the "man" in the system is not merely a system component, but also a person. Consequently, the designer should consider job content and job satisfaction. One step further is to accept him/her as a participant in the design process, or even as a co-designer (in a certain sense, the user is *the* expert; Seaman, 1982).

In fact, in these intermediate points of view the challenge is to harmonize two different points of view: man as a system component and man as a human being in his/her own right.

New IFAC Member Organization

The "Asociacion Chilena de Control Automatica (ACCA)", the Chilean Automatic Control Society, last year submitted an application for IFAC membership.

The General Assembly by postal ballot has approved this application and admitted Chile as 41st IFAC NMO with effect of January 1, 1983.

We welcome our new Member Organization and express our hope and confidence that ACCA will soon become a fully integrated and actively participating part of the IFAC family in accordance with the IFAC Constitution.

ACCA's officers, as elected on December 16, 1982, are:

President:
Prof. Dr. Ing. Aldo Cipriano

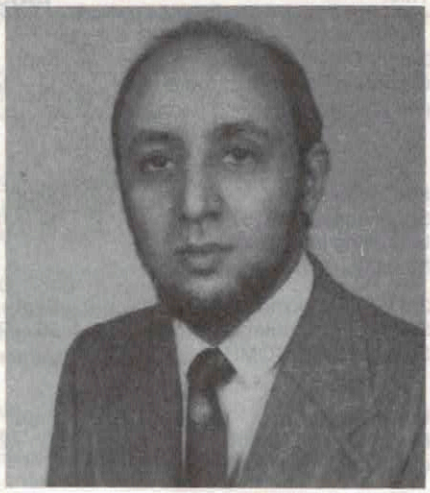
Vice President:
Prof. Ing. Guillermo Gonzalez, Ph. D.

Board Members:
Prof. Ing. Jorge Aravena, Ph. D.
Prof. Ing. Juan Hernandez, Ph. D.
Prof. Ing. Jorge Yutronic
Ing. Eduardo Lucero.

Their address is:

Casilla 4730
Santiago — 2, Chile.

WHO IS WHO IN IFAC



M. NAJIM
Chairman of DECOM

Professor Mohamed NAJIM was born on June 8, 1945, in Aïn Sbit, Morocco. He received the engineering diploma "Diplome d'Ingénieur" in electronics from ENSERB in 1967, University of Bordeaux and "Doctorat ès Sciences" from Toulouse University, France, in 1972.

From 1969 till 1972 he was assistant and instructor in the University Toulouse and ENSEIHT. In 1972 he joined the Faculté des Sciences Rabat, Morocco where he was nominated Professor in Electrical Engineering in 1974. He set up a research group in the Laboratoire d'Electronique et d'Etude des Systèmes Automatiques, LEESA, which by now consists of 25 members. In 1977, he co-founded, the AMADEIA, the Moroccan NMO of IFAC, and is presently its president.

Professor Najim has worked in several fields including instrumentation, electronic-circuits, microwaves, speech and seismic signal processing, identification and control. He has been in charge of several projects with the moroccan industry and agriculture on the control of phosphate processing plants, water resources allocation etc. and has published more than 40 scientific papers.

His current areas of interest include modeling and identification in control and signal processing. He has lectured in several foreign universities (Tunis, Tripoli, Bordeaux, Shanghai etc. . . .). He is member of the editorial board of the RAIRO. In 1980, he organised the Third IFAC/IFIP/IFORS/Conference on System Approach for Development and was co-editor of the proceedings. Last year the IFAC council appointed him chairman of the IFAC Technical Committee on Developing Countries, DECOM.

Most recently Prof. Najim and his group have been awarded the Abdulhamed Shuman Prize in the field of engineering in appreciation of their efforts in promoting Automatic Control in Morocco. This prize, named in honour of the late founder of the Arab Bank has been created by his son, Abdulmajed Shuman, who is at present heading the bank. The prize is financed by the "Abdulhamed Shuman Foundation" and is meant to encourage young Arab scientists under 40 who develop scientific activities within Arab countries.