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April

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The IFAC Database

As a result of the Affiliate- and Newsletter Survey conducted last year, IFAC currently has a database of roughly 1.800 entries. A thorough analysis of the replies we got from our Affiliates shows a considerable degree of satisfaction with the services we offer. What was particularly appreciated was the List of Forthcoming Events, published on a regular basis. As a consequence to some suggestions we got, we started to add e-mail, fax- and telephone numbers, to make communication between organizers and potential participants even easier. To our NMOs, i.e. the organizers of IFAC events, IFAC provides lists of addresses according to keywords, thus making it easier for them to reach the control engineers interested in the scope of the meeting they are organizing.

For your information, we publish our list of keywords below, giving the number of entries per keyword. Please contact us if you have not registered your fields of interest and wish to do so.

LIST OF KEYWORDS (According to number of entries)

- Adaptive Control & Systems
- Control Design
- Computers in Control
- Identification & Parameter Systems
- Artificial Intelligence
- Nonlinear Systems
- Computer Aided Design
- Chemical Process Control
- Education
- Large Scale Systems
- Distributed Systems
- Man-Machine Systems
- Modelling & Control of Non-Technical Systems
- Manufacturing Technology
- Distributed Parameter Systems
- Aerospace
- Economic and Management Systems
- Electric Power Systems
- Components and Instruments
- Biomedical Engineering & Control
- Other Fields of Interest
- Social Effects of Automation
- Metallurgy, Mining & Mineral Processing
- Biotechnology
- Automotive Control
- Marine Control
- Agriculture

NUMBER OF PERSONS REGISTERED PER KEYWORD

March 1994

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Further, we are also publishing the number of Affiliates per country overleaf to show how widespread the community of control engineers is. Please note that IFAC Affiliates spread over a total of 67 countries, with National Member Organizations only existing in 50 of them. Those countries which do not have an NMO are marked with an asterisk and our Affiliates are encouraged to seek possibilities of establishing an NMO in the country concerned. The NMO fees are determined by the IFAC General Assembly and are kept low by income generated by the IFAC publications income and conservative investment of capital funds. The benefits of having an NMO are very considerable. First of all, IFAC is shaped by its NMOs. All

Control Engineering Practice

Volume 2, Number 2
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Preview

- Energy-Efficient Train Control
(P.G. Howlett, I.P. Milroy and P.J. Pudney)
- Robust On-Line Differentiation Techniques With an Application to Underground Coal Mining
(S. Crisafulli and T.P. Medhurst)
- Finite Element Neural Network for Non-Invasive Plant Water Status Monitoring
(H. Murase, S. Koyama and A. Tani)
- Gain-Scheduled Lumped Parameter Multi-Input, Multi-Output Models of a Pilot-Plant Climbing Film Evaporator
(R.M. Allen and B.R. Young)
- Application of a Gain Scheduling Generalized Predictive Controller to a Solar Power Plant
(E.F. Camacho, M. Berenguel and F.R. Rubio)
- Inverse Kinematic Solution to a Calibrated Puma 560 Industrial Robots
(N. Chen and G.A. Parker)
- A Fuzzy Cell Mapping Method for a Sub-Optimal Control Implementation
(J.Y. Yen, W.C. Chao and S.S. Lu)
- A State-Space Model for Multiphase Transmission Lines
(R. Navarro-Adlemo)
- An Observer Design for Time-Delay Control and its Application to DC Servo Motor
(Pyung H. Chang and Jeong W. Lee)

Papers from the IFAC Workshop on Intelligent Autonomous Vehicles

- Preface to the Papers from the 1st IFAC Workshop on Intelligent Autonomous Vehicles
(D. Charnley)
- Terrain Adaptive Motion and Free Gait of a Six-Legged Walking Machine
(A. Halme, K. Hartikainen and K. Kärkkäinen)
- Attitude Estimation for a Vehicle Using Inertial Sensors
(J. Vaganay and M.J. Aldon)
- High-Speed Vehicle Guidance Based on Vision
(F. Jurie, R. Rives, J. Gallice and J.L. Brame)
- Laser Scanner Based Free Navigation of Autonomous Vehicles
(E. Freund and F. Dierks)
- Automatic Road Following Using Fuzzy Control
(B. Blöchl and L. Tsinas)
- Fuzzy Supervisory Path Tracking of Mobile Robots
(A. Ollero, A. Garcia-Cerezo and J.L. Martinez)
- Fuzzy Logic Control of Two-Degrees-of-Freedom Mobile Robots
(W. Oelen and J. van Amerongen)
- The Control Architecture of the PRIAMOS Mobile System
(R. Dillmann, J. Kreuziger and F. Wallner)

Abstracts

- IFAC Symposium: Low Cost Automation, September 1992, Vienna, Austria
- IFAC Symposium: Automated Systems Based on Human Skill (and Intelligence), September 1992, Madison, Wisconsin, USA
- IFAC Symposium: Automation in Mining, Mineral and Metal Processing, August 1992, Beijing, PRC

- Index of Abstracts
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decisions concerning IFAC are taken by the General Assembly, which is the sum total of its National Member Organizations. It is the General Assembly that elects the IFAC Officers, empowering them to represent IFAC in the spirit of the IFAC Constitution- and By-Laws. It is the General Assembly that approves any changes to the Constitution- and By-Laws by a two-thirds majority. And it is also the General Assembly which votes on potential new National Member Organizations. Another important factor is that it is only the NMOs which can organize IFAC events. There are many advantages in hosting an IFAC sponsored meeting. It is always an exceptional opportunity for the control engineers of the hosting country to meet their colleagues from all over the world. Important to know that IFAC does not charge any fee from organizers for its wide-ranging support so that the full financial benefit of the conference can be used by the host country, among others also for the payment of the membership fee.

AFFILIATES PER COUNTRY

Albania*	1	Kirgisia*	1
Algeria*	2	Korea, Dem. Rep.	7
Argentina	7	Korea, Rep.	9
Australia	69	Kuwait	1
Austria	17	Latvia	43
Azherbaidzan*	1	Lithuania*	2
Belgium	15	Macedonia	38
Bielorussia*	1	Mexico	13
Brazil	20	Morocco*	8
Bulgaria	19	Mozambique*	1
Canada	30	Netherlands	29
Chile	11	New Zealand	4
China, P.R.	117	Nigeria*	4
Croatia	4	Norway	23
Cuba	5	Pakistan*	4
Czech Republic	21	Poland	32
Denmark	20	Romania	15
Egypt	4	Russia, CIS	72
Estonia	5	Singapore	14
Finland	18	Slovak Republic	9
France	59	Slovenia	6
Germany	103	South Africa	18
Greece	7	Spain	30
Hong Kong	8	Sweden	35
Hungary	15	Switzerland	18
India	9	Taiwan*	6
Indonesia*	1	Turkey	13
Iran*	1	UK	161
Ireland*	3	Ukraine	19
Israel	15	United Arab Emirates	1
Italy	56	USA	153
Japan	49	Vietnam*	7
Kasakhstan*	1	Yugoslavia*	4
		Zimbabwe*	1

IFAC World Congress Sydney, Australia, 1993 Proceedings

The approximate prices and subjects for the Proceedings volumes are as follows:

Volume 1: Theory - Nonlinear Control, Time-Varying and Stochastic Theory, Discrete Events, Linear Systems
Price: £187,00

Volume 2: Robust Control, Design and Software - Robust Control, Design, Software
Price: £150,00

Volume 3: Applications I - Automobiles and Transportation, Biomedical and Biotechnology, Robots, Aerospace
Price: £180,00

Volume 4: Applications II - Process Control, Manufacturing, Minerals and Metal Processing, Power, Miscellaneous Applications
Price: £220,00

Volume 5: Associated Technologies and Recent Developments - Sensing and Measuring, Estimation, Social Effects and Economics, Education, Intelligent Control
Price: £163,00

Complete Set of 5 Volumes:
Prepublication Price (before June 1994): £610,00
Price on Publication: £810,00

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



NEWLY APPROVED EVENTS

1994
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Title	1995	Place	Deadline	Further Information
IFAC/IFIP Workshop Artificial Intelligence in Agriculture	May 29 - 31	Wageningen Netherlands	1 Nov. 1994	Prof. A. Udink ten Cate, Agr. Res. Dept. POB 59, NL-6700 AB Wageningen Netherlands FAX: +31/8370-24060
IFAC Symposium Adaptive Systems in Control and Signal Processing - ACASP '95	June 14 - 16	Budapest Hungary	1 Oct. 1994	Dr. G. Hencsey, Computer and Automation Institute, HAS, POB 63 H-1518 Budapest 112, Hungary e-mail: h103hen@ella.hu
IFAC Symposium Nonlinear Control Systems Design NOLCOS '95	June 26 - 28	Lake Tahoe CA, USA	15 Aug. 1994	Prof. A.J. Krener Dept. of Mathematics University of California Davis, CA, USA FAX +1/916/752 6635 e-mail: ajkrener@ucdavis.edu
IFAC Symposium Analysis, Design, and Evaluation of Man-Machine Systems - MMS '95	June 27 - 29	Cambridge MA, USA	15 April 1994	Prof. Thomas B. Sheridan 3-348 MIT Cambridge, MA 02139, USA FAX +617/253-4196 e-mail: sheridan@mit.edu
IFAC Symposium Modelling and Control of National and Regional Economies	July 2 - 5	Brisbane Australia	15 Sept. 1994	Dr. Ljubisa Vlacic Fac. of Science and Technology Griffith University Nathan, Brisbane, Qld. 4111 Australia FAX +61 7 875 5198 e-mail: vlacic@tomahawk.me.gu.edu.au
IFAC Conference Intelligent Autonomous Control in Aerospace	August 14 - 16	Beijing China, P.R.	30 Sept. 1994	Prof. Guang-Rui Zou Chairman of BICE POB 2729 Beijing 100080, China, P.R. FAX +861/254 3110
UNESCO/IEEE/IFAC Intl. Conf. Recent Advances in Mechatronics	August 14 - 16	Istanbul Turkey	17 April 1995	Prof. Okay Kaynak Bogazici University, Dept. of EE UNESCO Chair on Mechatronics 80815 Bebek - Istanbul Turkey FAX +90/212/257 50 30 e-mail: kaynak@vs6410.cc.boun.edu.tr

Economic Time Series Analysis and Systems Identification IFAC Workshop

Vienna, Austria, July 1 - 3, 1992

The workshop was organized to bring together researchers working in systems identification and time series analysis in a variety of different and partly completely separate disciplines, including in particular engineering, econometrics and statistics, in order to improve communication and enhance cross fertilization. The idea was that mutual understanding and discussions, concerning basic ideas, theories, methods, software and applications may contribute towards the further development of the subject.

The IFAC Information Brochure Edition 1993

is now available from the IFAC Secretariat. If you have marked that you wish to receive the Brochure on the Affiliate Registration Card, you will receive your copy in the near future. Copies will automatically be sent to all NMOs and IFAC Officials, or can be requested from the Secretariat by fax, e-mail or letter.

IFAC Publications

As of January this year, the IFAC publications business has been transferred to Elsevier Science Ltd, which is henceforth the official publisher of all IFAC publications, i.e. Postprint Volumes, Proceedings, the Journals *Automatica* and *Control Engineering Practice*, the IFAC Affiliated Journals and the Multilingual Dictionary of Automatic Control. The 'Pergamon' imprint on all IFAC publications will be preserved. The address of Elsevier Science Ltd is as follows:

The Boulevard
Langford Lane
Kidlington, Oxford OX5 1GB
UK

Papers From the May 1994 Issue

Papers

- Parameter Identification in Tidal Models with Uncertain Boundaries
(A. Bagchi, P. ten Brummelhuis)
- Expert Control of Air-Conditioning Plant
(K.V. Ling, A.L. Dexter)
- Diagnostic Reasoning Strategies for Means-End Models
(J.E. Larsson)
- Frequency Domain Approach to Optimally Robust Residual Generation and Evaluation for Model-Based Fault Diagnosis
(Xianchun Ding, P.M. Frank)
- Two Schemes for Information Acquisition: An Entropic Assessment
(H.R. Rao)
- Robust Tracking of Linear MIMO Time-Varying Systems
(Po-Yuan Huang, Bor-Sen Chen)
- A Hadamard Weighted Loop Shaping Design Procedure for Robust Decoupling
(F. van Diggelen, K. Glover)
- Proportional and Proportional-Derivative Canonical Forms for Descriptor Systems with Outputs
(G. Lebre, J.J. Loiseau)

Brief Papers

- Robust Stabilization for Composite Observer Based Control of Discrete Systems
(V-T. Liu, C-L. Lin)
- New Concepts for Cost-Effective Magnetic Bearing Control
(H. Bleuler, D. Vischer, G. Schweitzer, et al.)
- Direct Performance Optimization Using Laguerre Models
(P.R. Bélanger, O. Arafat, M. Gaber, et al.)
- Identification and Control of a Large Kinescope Glass Furnace
(Huaiqiang Zhang, C.Z. Han, B.W. Wan, R. Shi)

Technical Communiqués

- A Stochastic Interpretation of Membership Functions
(A. Hansson)
- Singularity-Free Adaptive Pole Placement for 2nd Order Systems
(R. Lozano, Xiao-Hui Zhao, R.G. Moctezuma)
- Persistence of Excitation Conditions for Partially Known Systems
(S. Dasgupta, B.D.O. Anderson, R.J. Kaye)

Book Review

- Parallel Processing in Digital Control, by D. Fabian, G. Nocetti and P. Fleming
(J. Kadlec)

Software Review

- Robust Control Toolbox, by R.Y. Chiang and M.G. Safonov
(E.M. Kasenally)

Papers From the June 1994 Issue

Papers

- Model-Based Fault Detection in Information Poor Plants
(J. Howell)
- Parametrization of All Linear Compensators for Discrete-Time Stochastic Parameter Systems
(E. Yaz, R.E. Skelton)
- Control of Symmetrically Interconnected Plants
(M. Hovd, S. Skogestad)
- Polynomial LQG Control of Back-Up-Roll Eccentricity Gauge Variations in Cold Rolling Mills
(S.G. Choi, M.A. Johnson, M.J. Grimble)
- An Iterative Scheme for Learning Gravity Compensation in Flexible Robot Arms
(A. de Luca, S. Panzieri)

Brief Papers

- Optimal Controller Synthesis with D Stability
(P.P. Khargonekar, N. Sivashankar, I. Kaminer)
- An Efficient Approach to the Detection of Bernoulli-Gaussian Processes
(P.E. Foudopoulos, S. Kollias, C. Halkias)
- Parameter-Dependent Lyapunov Function and the Discrete-Time Popov Criterion for Robust Analysis
(W.M. Haddad, D.S. Bernstein)
- Attitude Stabilization of a Rigid Spacecraft Using Two Control Torques: A Nonlinear Approach Based on the Spacecraft Attitude Dynamics
(Jie Chen, J.S. Freudenberg, C.N. Nett)
- The Role of the Condition Number and the Relative Gain Array in Robustness Analysis
(H. Chapellat, L.H. Keel, S.P. Bhattacharyya)
- A Multirate Digital Controller for Model Matching
(Hemera In, Cishen Zhang)
- A Synthesis Procedure for Discrete Linear Time-Dependent Control Systems
(C. Frangos, Y. Yavin)
- Robust Control of Cascaded and Individually Feedback Linearizable Systems
(Zhihua Qu, D.M. Dawson)
- MMSE Deconvolution via Polynomial Methods and its Dual LQG Regulation
(E. Mosca, L. Chisci)

Technical Communiqués

- On the Stability of Discrete-Time Linear Interval Systems
(P. Myszkorowski)
- Remarks on a 'Survey of Extreme Point Results for Robustness of Control Systems'
(E. Coxson)

Book Reviews

- Advances in Adaptive Control, by K.S. Narendra, R. Ortega and P. Dorato
(B. Wittenmark)
- Introduction to Chemical Process Instrumentation, by I. Nagy
(R.S. Benson)
- Telerobotics, Automation and Human Supervisory Control, by S. Sheridan
(R. Daniel)
- Model Reference Adaptive Control: From Theory to Practice, by H. Butler
(R. Johansson)
- Computer Systems for Automation and Control, by G. Olsson and G. Piani
(J.B. Levy)

WHO IS WHO IN IFAC



Prof. Walter Schaufelberger
IFAC Treasurer

Walter Schaufelberger was born in 1940. He obtained his basic engineering education in the Electrical Engineering Department of the Swiss Federal Institute of Technology (ETH) in Zurich from 1961 to 1968 with a PhD in the area of adaptive control with former IFAC President Prof. Dr. E. Gerecke. After a one-year period as lecturer at Queen's University in Kingston, Ontario, he became Assistant Professor at ETH in 1972 with promotions to Associate Professor in 1977 and to Full Professor in 1982.

He is specially interested in many different aspects of the wide field of Control Engineering covering both theory and practical applications and using computers for the design and implementation of control systems.

He was responsible for a major ETH-project for the integration of computers into the teaching process in all departments from 1986 to 1991. He is currently holding the position of Prorektor für Normalstudien with administrative duties for undergraduate affairs.

From 1984 to 1987 he was chairman of the Education Committee of IFAC and from 1987 to 1990 he was chairman of the Working Group on 'Teachware for Control'. At the General Assembly in July 1993, Professor Schaufelberger was elected Treasurer of IFAC.

Informal Meeting of the IFAC Officers Laxenburg, Austria March 12 - 14, 1994

As always after a World Congress, a slightly changed group of participants gathered at the Secretariat premises in Laxenburg, IFAC President Dr. S. Kahne coordinated the informal discussions. Further present were Prof. Y.Z. Lu, President-Elect, Prof. B.D.O. Anderson, Past President, Prof. V. Kucera, Chairman of the Technical Board, Prof. P. Albertos, Chairman of the Executive Board, Prof. W. Schaufelberger, Treasurer and Dr. G. Hencsey, Secretary. Prof. Kucera, Prof. Albertos and Prof. Schaufelberger were in Laxenburg for the first time in their respective new functions. This meeting, among others, offers the opportunity for an informal exchange of opinions, but first and foremost to come together at the IFAC Secretariat premises and to have the possibility to meet representatives of the Austrian authorities (Austrian Ministry of Research and Science, Austrian Academy of Sciences, the IFAC Beirat in Austria) and representatives of the Austrian NMO of IFAC. IFAC is very grateful for the continued support by Austria. The Secretariat has been located in Laxenburg since 1978, when a contract was negotiated between D.I. Fred Margulies, then IFAC Secretary on behalf of IFAC and Dr. Hertha Firnberg, then Minister of Science and Research. With great regret we learned that Dr. Hertha Firnberg passed away in February this year. Among her many other achievements, she will always be remembered by us as having helped the IFAC Secretariat to find a permanent home.