



1995
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Newsletter

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*Merry Christmas
and a
Happy New Year*

13th IFAC World Congress

30 June – 5 July, 1996

San Francisco, CA, USA

Information Update

The paper selection process for the San Francisco World Congress is practically completed, and we are proud to say that the quality of the papers submitted is exceptionally high, thus promising a high standard of the Congress. Apart from the purely technical side, there is some further information which will be of interest to prospective Congress participants.

Congress Dates:

June 30 – July 5, 1996

Opening Ceremony:
Sunday afternoon, June 30

Technical Program:
Monday - Friday, July 1 – 5

Pre-Congress Tutorials:
Saturday - Sunday, June 29 – 30

Registration Fee

full advance fee: \$ 400.00
full late fee: \$ 500.00

student advance fee: \$ 150.00
student late fee: \$ 200.00

The deadline for advance registration is

April 15, 1996.

Late fees apply if payment is received by the Organizing Committee after this date (including on-site registration). Student status has to be verified by the student's institution or adviser.

The registration fee includes:

- attendance at the technical sessions
- the Congress publications (as detailed below)
- attendance at the opening Ceremony and Reception, and
- refreshments between Congress sessions.

The full fee also includes attendance, for one person, at the Congress dinner.

Registration forms will be distributed in January 1996, together with the Preliminary Program outlining the Congress structure.

Financial Aid

Limited funds are expected to be available to assist a small number of authors from developing countries who would not otherwise be able to attend the Congress. Authors wishing to obtain more information should contact

Professor Peter Luh, Financial Aid Coordinator
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University of Connecticut
Storrs, CT 06269-3157, USA
Phone: +1(203)486-4821
Fax: +1(203)486-2447
e-mail: luh@farside.ese.uconn.edu

Hotel Accommodation

Attendees are advised to stay in the San Francisco Marriott, the Congress hotel, at Fourth and Mission Street. The special hotel rate for Congress participants is:

\$ 129.00 per night, plus 12 % tax

This rate is for the room with one or two persons in occupancy. There is a \$ 20 per night charge for each additional person (beyond two). The special rate applies during the period of June 27 to July 6, 1996. The deadline for hotel registration is May 23, 1996. Registration forms will also be provided with the Preliminary Program in January 1996.

Please note that hotel rooms in the San Francisco area are quite expensive and it is difficult to find reasonable accommodation for less than the above rate. A way of reducing hotel expenses is to share the room with another Congress participant.

Those needing assistance in finding a roommate should send an e-mail to:

roommates@ece.orst.edu

with their (1) name, (2) gender, (3) dates attending the Congress, (4) smoking/non-smoking preferences, and (5) e-mail address. This information will be compiled into lists by gender and distributed by e-mail to those on the list, every two weeks, starting March 1. Each person will then be responsible for selecting his/her roommates and making hotel arrangements.

Technical Program

The technical program of the Congress features:

- five plenary lectures
- regular paper sessions (contributed/invited in lecture/poster format)
- special sessions and lectures (surveys, case studies, benchmark sessions, and panel discussions)

All technical activities of the Congress, with the exception of the Plenary Lectures, will be organized in the form of nine Congress Symposia, each one covering a coherent field within automatic control. The program of each Symposium will be further subdivided into Technical Areas, following the Technical Committee structure of IFAC. The detailed program structure and session arrangement will be included in the Preliminary Program, to be distributed in January 1996.

Congress Publications

As already foreshadowed in previous Newsletters, the following types of publications will be available:

- A CD-ROM containing the full technical material

- of the Congress. The disk comes with a single user licence and is readable under MS-Windows and Apple Mac.
- Sixteen to eighteen printed Subject Volumes, each containing the papers of a coherent set of Technical Areas.
- A printed volume containing the Plenary Lectures and a Table of Contents, Author Index to the Subject Volumes and the CD-ROM.

As part of their registration, Congress participants will receive:

- one copy of the CD-ROM,
- two printed Subject Volumes of their choice, and
- one copy of the printed Plenary and Index Volume.

Any participant may purchase up to three additional printed Subject Volumes. The expected cost of each extra printed Subject Volume is \$ 18, if ordered with advance registration, or \$ 24, if ordered with late registration or on the spot.

Participants will be requested to indicate on their registration form which Subject Volumes they choose. Selections received before the advance registration deadline will be guaranteed. After that they will be handled on a first-come, first-serve basis.

Pre-Congress Tutorials

A series of Pre-Congress Tutorials (workshops) to be given by leading experts in their fields is being organized. Introductory tutorials are planned for Saturday, June 29, while advanced tutorials will take place on Sunday, June 30. There will be an extra fee for attending these workshops. The detailed program of tutorials will be included in the Advance Program, available in January 1996.

Technical Visits

Technical Visits will be arranged to both universities and companies in the San Francisco area.

Social Programs

The Opening Ceremony will be followed by a Welcoming Reception, open to Congress participants and their guests.

The Congress Dinner will be in the style of an American barbecue party, traditional for the celebration on the 4th of July, the American Independence Day. Full registration includes the Congress dinner for one person. Extra dinner tickets may be purchased for \$ 65 each.

San Francisco and the Bay area offer numerous tourist attractions. A full schedule of tours during and after the Congress will be available. Details will be included with the registration materials provided in the Preliminary Program, to be distributed in January 1996.

Visas

U.S. immigration law requires an entry visa for citizens of most countries of the world. It is advisable to allow sufficient time for visa arrangements.

For further information, please contact

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<http://web.eecs.nwu.edu/~ahaddad/aacc.html>

Real Time Programming – WRTP'95 IFAC Workshop (20th) Ft. Lauderdale, FL, USA, 6 – 10 November, 1995

The 20th Workshop in this series was sponsored by IFAC and co-sponsored by IFIP. WRTP'95 enjoyed the benefits of running in conjunction with the First IEEE Conference on Engineering of Complex Computer Systems (ICECCS 95), the 5th Complex Systems Engineering Assessment Technology Workshop (CSESATW), and the 3rd Real-Time Applications Workshop (RTAW). These related conferences and workshops drew over 180 participants from almost 30 countries.

The joint conference was run in an integrated fashion - rather than labeling each paper with a conference tag, all papers were blended into a three-track schedule. The track groupings were by topic, including complex and dependable real-time systems (where many of the WRTP 95 papers were presented), formal methods, languages, tools and environments, systems and software engineering, advanced applications such as imaging, database systems, and heterogeneous systems.

The unifying theme of the conference was the problem presented by the designed construction and maintenance of complex computer systems. Complex computer systems are important in many sectors such as manufacturing, communications, defense, transportation, aerospace, hazardous environments, energy, health care, and more. These systems frequently include distributed heterogeneous networks and are constrained by requirements on performance, real-time behaviour,

fault-tolerance, security, adaptability, development time and cost, long life concerns, and other areas.

Four keynote speakers highlighted the workshop-conference activities. Dr. David Parnas, Professor of Computer Science at McMaster University, and Software Engineering legend, stressed that building complex systems was not a desirable goal. Rather, we should strive to build simple systems with complex behaviour. Rear Admiral George Hutching, Direct Reporting Program Manager for the Navy's Aegis Combat System, spoke on the need to consider the 'man in the loop' in developing complex systems. The Honourable Anita K. Jones, Director of Defense Research and Engineering for the United States Department of Defense discussed incentives in developing standardization to allow for better interoperability of complex systems. Finally, Remi Bourgonjon, Director of Information and Software Technology of Philips Research discussed the evolution of electronics based systems to complex combinations of hardware and software.

The papers presented for WRTP 95 and contained in the proceedings, reflect the desire to bring together industrial, academic, and government experts from various disciplines and to promote long-term research, near-term effective complex system requirements and promising tools. We want to thank all of the authors for their outstanding contributions.

Dr. Philip Laplante, IPC Chairman

Recent Advances in Mechatronics – ICRAM'95 International Conference Istanbul, Turkey, 14 – 16 August, 1995

The objective of ICRAM'95 was to provide an international forum for the dissemination of knowledge and experience on research, development, application, education and training in the field of mechatronics. The papers to be presented were expected to address not only the recent advances but also the future perspectives. In order to reach these objectives, the technical program of the conference was constructed so that it included four plenary presentations by:

Fumio Harashima (University of Tokyo, Japan)
Jim R. Hewitt (University of Dundee, UK)
Rolf Isermann (Technical University of Darmstadt, Germany)
Masayoshi Tomizuka (UC Berkeley, USA)

and six invited presentations by:

Paul Drews (European Center for Mechatronics, Germany)
Abdulkadir Erden (Middle East Technical University, Turkey)
Kouhei Ohnishi (Keio University, Japan)
Friedrich Pfeiffer (Technical University of Munich, Germany)
Zenon Pudowski (Monash University, Australia)
Kamal Youcef-Toumi (MIT, USA)

In addition, 11 special sessions listed below were organized by well known experts from different parts of the world:

Mechatronics Research in Germany (organized by: Manfred Hiller, Duisburg University, Germany)
Mechatronics Design (organized by: Mauri Airila, Helsinki University of Technology, Finland)
Machine Vision Applications (organized by: Seiji Hata Kagawa University, Japan)
Mechatronics Education and Training (organized by: Memis Acar, University of Technology, UK)
Intelligent Machine Control (organized by: Kok-Meng Lee, Georgia Institute of Technology, USA and Sabri Tosunoglu, Florida International University, USA)
Piezomechanics (organized by: Robert M. Parkin, University of Technology, UK)
Aeronautical Mechatronics (organized by: Okyay Kaynak, Bogazici University, Turkey)
Hardware/Software Co-Design (organized by: William Fornacieri, Cefriel, Polytechnic of Milan, Italy)
Mechatronics Design in Textile Engineering (organized by: Mansour H. Mohamed, North Carolina State University, USA)
Simulation of Adaptive Behaviour for Mechatronic Systems (organized by: Chris Czarneki, De Montfort University, UK)
Balanced Automation Systems - Planning and Applications (organized by: Rolf Bernhardt, IPK-Berlin, Germany)

The regular sessions of the conference were on the topics of

Design and Development of Mechatronic Machines
Sensors and Actuators in Mechatronics
Vibration Control in Mechatronics
Modelling, Analysis, Design and Simulation
Micro-Electric Mechanical Systems
Robotics and Motion Control
Mobile Robotics

Control of Electrical Drives
Intelligent Machine Control
Fuzzy and Intelligent Systems
Neural Networks
Nonlinear Control
Control and Algorithms
Production Automation
Flexible Manufacturing Systems
Petri Nets
Computer Vision
Measurement Technology
Education and Training in Mechatronics

During the meetings almost all of the papers were presented, the percentage of no-show papers was less than 4 %. This was due to special measures taken, such as requesting advance registration at the time of the submission of manuscripts.

One of the highlights of the meeting was the opening address presented by Prof. George Metakides (Director of Information Technologies R&D Programme, Directorate General III, European Commission) with the title 'Building the Global Information Technology'. His talk emphasized the importance of mechatronics in the field of the information society and described related activities and research programmes in the EU.

The conference was attended by about 200 persons from 34 different countries. Many of these participants thought that ICRAM'95 was both scientifically and socially rewarding. It was said that the scientific level of the program was exceptionally high for a meeting held in a country at the onset of industrialization, matching the top level meetings in industrial countries. This was mostly due to the grant of the National Science Foundation of the USA (\$ 16,500,—) which permitted, among others, the participation of 12 prominent academicians from the USA and the strong presence of Japanese mechatronics experts. The participation from the United Kingdom, Germany and Finland (mechatronics is an established and strong field in these countries) was also very high.

The program of ICRAM '95 also included two post-conference tours into Anatolia. The major intention of these tours was to promote in-depth technical discussions in an expert group of limited size as well as offering a taste of the historical and cultural treasures of Turkey. It is hoped that a number of scientific collaborative projects will be developed in the future as a result of the contacts made and the friendships established among the participants during the tour.

Okay Kaynak
General Chair

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Control Engineering Practice

Volume 3 Number 12, December 1995

Preview:

Fuzzy Control of an Iron Ore Sintering Plant
(C. Arbehther, H.P. Jörgl and H. Raml)
Homogeneous and Heterogeneous Parallel Architectures in Real-Time Signal Processing and Control
(M.O. Tokhi and M.A. Hossain)
Fuzzy Control of an Overhead Crane Performance Comparison with Classic Control
(A. Benhidjic and G.L. Gissinger)
Fuzzy Logic Coupling and Synchronised Control of Multiple Independent Servo-Drives
(P.R. Moore and C.M. Chen)
On-Line Fault Diagnosis of Dynamic Systems via Robust Parameter Estimation
(G. Bloch, M. Ouladsine and P. Thomas)
A Neural Network Approach to Freeway Network Traffic Control
(M. Papageorgiou, A. Messmer, J. Azema and D. Drewanz)
Industrial Actuator Benchmark for Fault Detection and Isolation
(M. Blanke and R.J. Patton)
Fault Detection for a Diesel Engine Actuator - A Benchmark for FDI
(M. Blanke, S.A. Bogh, R.B. Jorgenson and R.J. Patton)
An Observer and Signal-Processing Approach to FDI for the Industrial Actuator Benchmark Test
(Th. Höfling, Th. Pfoufor, R. Deibert and R. Isermann)
A Frequency Domain Approach to Residual Generation for the Industrial Actuator Benchmark
(E. Alcorta-Garcia, B. Köppen-Seliger and P.M. Frank)
An Eigenstructure Assignment Approach to FDI for the Industrial Actuator Benchmark Test
(R. Billo Jorgenson, R.J. Patton and J. Chen)
A Parametric Statistical Approach to FDI for the Industrial Actuator Benchmark
(R.W. Grainger, J. Holst, A.J. Isaksson and B.M. Ninness)
Multiple Hypothesis-Testing Approach to FDI for the Industrial Actuator Benchmark
(S. Bogh)
FDI by Extended Kalman Filter Parameter Estimation for an Industrial Actuator Benchmark
(B.K. Walker and Kuang-Yang Huang)

IFAC Meeting Papers - Keyword Listing

Intelligent Autonomous Vehicles, June 1995, Espoo, Finland
Control Applications in Post-Harvest and Processing Technology, June 1995, Ostend, Belgium
Distributed Computer Control Systems, September 1994, Toledo, Spain

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Control Engineering Practice

Volume 4 Number 1, January 1996

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Designing Human-Machine Interfaces to Match the User's Mental Models
(P. Fuchs-Frohnhofen, E.A. Hartmann, D. Brandt and D. Weydandt)
Modelling and Control of an Eddy Current Brake
(E. Simeu and D. Georges)
SEPIA: A Real-time Expert System that Automates Train Route Management
(Y. Larroche, R. Moulin and D. Gauyacq)
Fuzzy Systems Design Based on a Hybrid Neural Structure and Applications to the Fault Diagnosis of Technical Processes
(M. Ayoubi)
Data Fusion Using Sensor Data and A Priori Information
(A. Filippidis)
Modelling and Estimation Aspects of Adaptive Predictive Control in a Fermentation Process
(G. Roux, B. Dahhou and I. Quelnnec)
Monitoring of an Operator's Vigilance Level by Skin Resistance Response
(V. Gavchenko)
Control of Counter-current Washing Operation in Alumina Production; Classical and Optimal Solutions
(Y.L. Sidrak)

Special Section on Computer Software Structures Integrating AI/KBS Systems in Process Control (Guest Editor: K.E. Årzén)

Preface to the Special Section on Computer Software Structures Integrating AI/KBS Systems in Process Control
(K.-E. Årzén)
Software Integration of Real-Time Expert Systems
(R.K. Chun)
Time-Dependent System Knowledge Representation Based on Dynamic Master Logic Diagrams
(Y.-S. Hu and M. Modarres)
Dynamic Application of Action Plans in the Alexip Knowledge-based System
(S. Cauvin)
Qualitative Fault Detection Based on Logical Programming Applied to a Variable Air Volume Air-handling Unit
(L. Fomera, A.S. Glass, P. Gruber and J. Tödli)
Knowledge-based Modelling of a TV-tube Manufacturing Process
(N. Rakoto-Ravalontsalama and J. Aguilar-Martin)

IFAC Meeting Papers - Keyword Listing

Adaptive Systems in Control and Signal Processing, June 1995, Budapest, Hungary
Large Scale System: Theory and Applications, July 1995, London, UK

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Trends in System Identification
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- Nonlinear Black-box Modeling in System Identification: A Unified Overview
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- Nonlinear Black-box Models in System Identification: Mathematical Foundations
(A. Juditsky, H. Hjalmarsson, A. Benveniste, B. Delyon, L. Ljung, J. Sjöberg, Qinghua Zhang)
- Identification and Control - Closed-loop Issues
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- Estimation of Model Quality
(B. Ninness, G.C. Goodwin)
- Worst-case Control-relevant Identification
(P.M. Mäkilä, J.R. Partington, T.K. Gustafsson)
- System Identification with Generalized Orthogonal Basis Functions
(P.M.J. van den Hof, P.S.C. Heuberger, J. Bokor)
- Subspace-based Methods for the Identification of Linear Time-invariant Systems
(M. Viberg)
- A Unifying Theorem for Three Subspace System Identification Algorithms
(P. van Overschee, B. de Moor)
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- Choice of State-space Basis in Combined Deterministic-Stochastic Subspace Identification
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Technical Communiques

- Reducing the Computation Required to Solve a Standard Minimax Problem
(P.M. Fitzsimons)
- Uncertainties for Recursive Estimators in Non-linear State-space Models, with Applications to Epidemiology
(J.L. Maryak, J.C. Spall, G.L. Silberman)
- A Comment of 'A Time-varying Sliding Surface for Fast and Robust Tracking Control of Second-order Uncertain Systems
(A. Bartoszewicz)

Editorial

Automatica and Applications Papers
(H. Kwakernaak, Editor-in-Chief)

Papers

- Optimal Nonlinear Estimation for Aircraft Flight Control in Wind Shear
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- Feedback Control of Petri Nets Based on Place Invariants
(K. Yamalidou, J. Moody, M. Lemmon, P. Antsaklis)

- Output Regulation for Linear Systems Subject to Input Saturation
(Zongli Lin, A.A. Stoorvogel, A. Saberi)
- Modeling and Control of a Flexible Solar Array Paddle as a Clamped-Free-Free-Free Rectangular Plate
(F. Matsuno, M. Hatayama, H. Senda, T. Ishibe, Y. Sakawa)
- Nonlinear Control of Surge in Axial Compression Systems
(O.O. Badmus, S. Chowdhury, C.N. Nett)
- Development and Evaluation of an Auto-tuning and Adaptive PID Controller
(E. Poulin, A. Pomerleau, A. Desbiens, D. Hodouin)

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- New Method for Optimal Control and Filtering of Weakly Coupled Linear Discrete Stochastic Systems
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- Holistic Modelling as a Tool for the Diagnosis of Critical Complex Systems
(H.G. Natke, C. Cempel)
- Feasible Control Design for Plants with Discrete-time Markov Jump Parameters
(C. Frangos, Y. Yavin)
- A Different Look at Output Tracking: Control of a VTOL Aircraft
(P. Martin, S. Devasia, B. Paden)
- Active Control of Compressor Stall Inception: A Bifurcation-theoretic Approach
(D.-Ch. Liaw, E.H. Abed)
- The Relative Order and Inverses of Recurrent Networks
(C. Kambhampati, S. Manchanda, A. Delgado Rivera, G.G.R. Green, K. Warwick, M.T. Tham)

Correspondence Items

- Comments on: 'On Compensation for Neglected Actuator Dynamics
(S.B. Phadke, M.M. Kuber)
- Authors' Reply to Drs Phadke's and Kuber's Comments

Technical Communiques

- Adaptive Stabilization of Time-varying Discrete-time Linear Systems
(M.I. Troparevsky)
- State Feedback Impulse Elimination of Linear Time-varying Singular Systems
(Chi-Jo Wang)

Human Oriented Design of Advanced Robotics Systems

DARS'95

IFAC Workshop

Vienna, Austria, 19 - 20 September, 1995

The first IFAC Workshop on this topic took place at the Technical University in the heart of Vienna, the capital of Austria. It was organized by the Institute of Handling Devices and Robotics (TU Vienna) and sponsored by IFAC and the IFAC TC on Cultural Aspects of Automation (HAC).

Novel approaches for advanced robotics systems will be applied in the industrial production and in many other areas in the near future. For the employees to be able to work with these systems, new ergonomical, social and cultural aspects must be taken into consideration. At the workshop, new aspects of design were outlined and discussed.

The objectives of the Workshop were to provide a forum for the exchange of the latest knowledge and new ideas developed in science and technology with respect to new ergonomical, social and cultural aspects of the design of robotics systems. The main topics of the scientific program were:

- the system design, specifically of the man-machine interface, for autonomous, semi-autonomous and tele-operated mode and for tele-existence;

NEWS FROM NMOs The Instrumentation Society of Indonesia (Himpunan Instrumentasi Indonesia - HimII)

As a developing country, Indonesia has been very active in the past 25 years in promoting the industrial sector as a main line of the long-term national program in economic and social development. Parallel to the development of the professional human resources in engineering and the life in Indonesia in general and in order to support the industrial development in Indonesia, the HimII was created in 1980 by the commitment of a number of Indonesian scientists and engineers who were interested in control and instrumentation technology. At present, the HimII has more than 100 very active members from industries and universities in Indonesia.

HimII has two National Forums of academic activities; they are the National Presentation and Exhibition for Science and Technology PPI-KIM, held every December in Jakarta, and the National Seminar and Tutorial on Computer Based Instrumentation and Control, SIK, held every two years in Bandung. These meetings are attended by engineers and researchers from industries and universities of all regions in Indonesia.

There is a number of very important laboratories and universities in Indonesia which concentrate their activities on control engineering.

Many kinds of industries are developing in Indonesia, including the petro-chemical industries, pulp and paper industries and manufacturing industries. The government is stimulating all kinds of engineering research in all industries in Indonesia. In parallel, the HimII has a strong commitment in supporting the national program for human resources development, for engineering and science, to accelerate the industrial development in Indonesia. As National Member of IFAC, HimII hopes to increase research activities of all its members.

- the organizational and social aspects with respect to the environment in which the system is embedded;
- the cultural aspects due to different living and working traditions and conditions of the people involved;
- the economic aspects.

The following number of papers was given in the areas as given below:

4 survey, 4 modelling, 4 man-machine interface design, 3 various aspects, 4 manufacturing, 6 assisted vehicle driving, 13 planning control and sensor/recognition

The opening address was given by Professor H.B. Matthias, Vice-Rector of the Technical University of Vienna.

The Workshop included 4 survey papers and 34 regular papers. The 46 participants came from 13 different countries. The next workshop on DARS will take place in 1998.

P. Kopacek, Chairman, NOC

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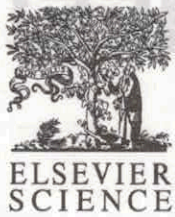
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Automatica (00270)

This journal publishes papers on theoretical and experimental research and its practical application to all types of control systems. Topics covered include: the theory, design, and characterisation of control systems and components, the reliability of components and systems, data processing and computers for control purposes, computer-aided design and manufacturing and control of various industrial processes, space vehicles and aircraft, ships, traffic, biomedical systems, agriculture and natural resources. The journal also includes the following special features: survey papers, book reviews and technical communiques.

Control Engineering Practice (00123)

This is a journal for engineers whose research deals with real-life problems of control and optimisation, whether they are employed in academic departments or as development engineers in industry. The emphasis is on readability and the transfer of ideas rather than on the completeness of research. The journal contains papers with a strong applications flavour across the whole field of control: the journal is centred in engineering - but also extends into applications in economics and the life sciences. Case histories are encouraged and reviews and special issues on particular types of problems are commissioned.

Engineering Applications of Artificial Intelligence (00975)

Artificial Intelligence (AI) techniques are now being used by the practicing engineer to solve a whole range of hitherto intractable problems. This journal provides an international forum for rapid publication of work describing the practical application of AI in methods in all branches of engineering.

Journal of Process Control (03057)

The journal covers the application of control theory, operations research, computer science and engineering principles to the solution of process control problems. Papers on theory in these areas are accepted provided the theoretical contribution is aimed at process control.

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