



# IFAC Newsletter

## Issue 2 (April) 2002

International Federation of Automatic Control

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  - Journal of Engineering Applications of Automatic Control, Issue 5, October 2001

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## **New Technologies for Computer Control (NTCC 2001)**

### **IFAC Conference**

**19-22 November 2001, Sheraton Hotel, Hong Kong, China**

The advent of computers has gradually led to a second industrial revolution. We can perform many tasks now with high reliability and accuracy that we have never thought possible before. Our ability to perform increasingly powerful tasks continues to grow. In the area of control, we benefit from the development of new technologies, such as networking of computers, ever-increasing computing power, mechatronics and intelligent sensors for improving the reliability and safety of control systems. Implementing sophisticated control algorithms and structures are within easy reach. It is the right moment at the beginning of the new millennium to review the status of the current development and to work out a road map for Computer Control in the 21<sup>st</sup> century, which is the main goal of this multi-track Conference.

The initial idea to organize the Conference was put forward five years ago, and was finally taken up during the 1999 IFAC World Congress held in Beijing by the Coordinating Committee on Computer Control together with its five Technical Committees (TCs): TC on Distributed Computer Control Systems, TC on Real-Time Software Engineering, TC on Artificial Intelligence in Real-Time Control, TC on Algorithms and Architectures for Real-Time Control, and TC on Safety of Computer Control Systems. As these Technical Committees covered important and essential aspects of computer control, there were not only in-depth discussions in each of these technical areas, but also ample opportunities for cross-fertilization.

There were 6 plenary papers and 87 regular papers presented at the Conference. The plenary papers covered a range of important topics in computer control, which included delivery of time-sensitive information, evolutionary computing for control engineers, transparent neurofuzzy modeling and an interesting application area relating to the computer control of combustion engines. The regular papers covered a broad range of topics including: parallel and distributed computing, software architecture and hardware for distributed computer control, real-time operating systems, real-time communication architectures, intelligent control, evolutionary control techniques, safety aspects of control systems. The Conference was concluded by a plenary panel discussion on the Road Map for Computer Control organized by Professor Henk Verbruggen and chaired by Professor George Irwin. There were 109 participants from 29 countries attending the Conference. The Conference was well supported by IFAC and attended by Professors Vladimir Kucera (President-Elect), Rolf Isermann and Wook-Hyun Kwon (Vice-Presidents), CC and TC Chairs as well as Frank Lewis and Peter Fleming.

The Conference was held in the Sheraton Hotel in the heart of Hong Kong. For the social program, a boat trip to the outskirts of Hong Kong was organized to watch Chinese White Dolphins, an endangered species because of the polluted environment.

A new feature of the Conference aiming to encourage more local participation, and to emphasise the applications aspect of the Conference was a one-day Symposium on "New Technologies for Computer Control – Intelligent Buildings" organized on the last day at the venue of the Conference. Participants were free to attend either the Conference or the one-day Symposium. To provide some form of integration between them, the afternoon program of both events were common, which included two presentations on Hong Kong's experience on the application of intelligent control and automation, and the plenary panel discussion on the Road Map for Computer Control. This approach was highly successful, as around 90 local professional control engineers attended the one-day Symposium, and also participated actively in the plenary panel discussion. This new approach seems to be successful in promoting and encouraging more local participation of IFAC events.

C. W. Chan and H. B. Verbruggen  
IPC Chairs

## In Memoriam



### Boris Tamm

**23 June 1930 – 5 February 2002**

**Dear Velve, Dear Reet and the Entire Family,**

We all were really shocked by the death of Boris Tamm. It will soon be clear what I mean by "we all".

The present IFAC President, Pedro Albertos from Spain, asked me to speak on his and the IFAC-family's behalf and to forward to you Velve and to all the family members our sincere condolences. I can assure you that our deepest sympathy is with you.

Many things have already been said by the previous speakers about Boris Tamm and I do not want to repeat these. Therefore, I would like to concentrate mainly on one important part of his life - on his international activities. This is to a great extent correlated with the International Federation of Automatic Control, called IFAC. Already in 1956, at one of the first conferences of Automatic Control in Heidelberg, some far-sighted scientists and engineers from East and West gathered and proposed to create an international organisation. A year later, in 1957, IFAC was founded in Paris.

The first IFAC World Congress took place in Moscow 1960. At that time Professor Aleksander Letov, vice chairman of the "Institute Problem Upravlenija" then called "Institute Avtomatika i Telemekhanika", was the IFAC president. The following IFAC World Congresses, which always take place in a three-year cycle, were organized in 1963 in Basle, in 1996 in London, in 1969 Warsaw and 1972 in Paris.

It was a year later, in 1973 during an IFAC meeting in Visegrad near Budapest, where Boris and I, our families included, got really acquainted with each other. The next two IFAC World Congresses took place in Boston in 1975 and in Helsinki in 1978. After the Helsinki Congress a number of colleagues travelled to Tallinn to visit Boris and relevant research institutions.

Further IFAC Congresses were organised in 1981 in Kyoto, 1984 in Budapest and 1987 in Munich when I was the President of IFAC. At the end of the Munich Congress it was my pleasure to hand the IFAC Presidency over to Boris Tamm. I did it with great joy, because I knew that the IFAC-matters were in excellent hands. We all remember the Tallinn IFAC World Congress with great pleasure which took place in the year 1990. Not only that it was excellently organized in a difficult period but in addition the great hospitality in Tallinn impressed us all very much.

From the fact that Boris was a visiting professor at my institute at the University of Hannover in the years 1991/1992 for nine months, one can see how close the scientific and personal relations were. By the way we did create two bridges. One is the scientific cooperation. The other is that my daughter Susanne, a close friend of Reet, my wife Elisabeth, called Liesel, and I had several times the great pleasure to play "bridge" with Boris. It was one of his hobbies and he was a fine bridge player.

A characterization of Boris would be incomplete without mentioning his very nice personality. He was a warm-hearted man and very much liked by all of us. His remarkable human qualities can much better be expressed in German than in English, namely he was a real "Vorbild" (role model), not only to students but in general.

We all mourn his loss. Liesel and I lost a real friend.

May Boris rest in peace.

Manfred Thoma, former IFAC President and IFAC Adviser

Born in Tallinn, Boris Tamm finished the English College here. In 1954 he completed his studies as electrical power engineer at Tallinn Technical University. Boris Tamm earned his degree of the Candidate of Sciences (PhD) in technical cybernetics from the Institute of Automatics and Telemechanics, Moscow, in 1962 and in 1969 he received his doctoral degree (DSc) in systems engineering from the Estonian Academy of Sciences.

As a well-known expert and a talented organizer, Boris Tamm was nominated to the post of the Director of the Institute of Cybernetics of the Estonian Academy of Sciences for the period 1969—1976. In 1976—1990, as Professor and Rector, he contributed to the development of Tallinn Technical University and was at the same time active in expanding international cooperation in the field of automatic control. He was elected President of the International Federation of Automatic Control (IFAC) for the three-year period 1987 - 1990. From 1994 to 1999, he served as Vice-President of the Estonian Academy of Sciences and from 1991 to 1999, as Chairman of the Division of Informatics and Engineering.

In 1991/1992 he was a Visiting Research Professor at the Department of Automatic Control of the University of Hannover. Since 1995 he has been a Professor of Tallinn Technical University, and at the same time worked as senior research fellow at Cybernetica Ltd.

Early research activities of Boris Tamm were focused on the design of object-oriented programming languages and systems for numerically controlled milling machines and flame cutters. By the end of the 1960s, he had developed methods of compiling computer-aided software engineering (CASE) tools for designing dedicated programming environments of a large spectrum of engineering processes. In the 1980s he studied human-machine operations, modelling of learning processes and then, in the early 1990s, artificial intelligence problems. His last research interests lay in expert system technology together with non-linear adaptive control of dynamic systems. He has been supervisor or advisor to over ten successful postgraduate students.

In addition to his active career as a scientist and organizer, his list of honorary appointments from different foreign institutions is impressive. Since 1978 Boris Tamm has been a Foreign Member of the Finnish Academy of Technology. He was Doctor Honoris Causa of the Budapest University of Technology (1982) and of the Helsinki University of Technology (1988), Foreign Member of the Royal Swedish Academy of Engineering Sciences (1990), and since 1993 an Advisor of IFAC.

Since 1991 he was Chairman of the Managing Board of the "PIC Eesti AS", in 1998—1999 he was Member of the Board of the Estonian Confederation of Employers and Industry, Member of the Boards of the Estonian Science Foundation and Estonian Innovation Foundation and Member of the Working Group of Thematic Network on Foresight of Joint Research Centre of the Institute for Prospective Technological Studies (European Commission). Up to the last days of his life he was Chairman of the Educational and Science Planning Group of the Estonian Ministry of Defence. He was also a Member of the Council of the Estonian Foundation of National Culture and of the UNESCO Estonian National Committee.

Boris Tamm has been awarded the Estonian National Science Award (1966), the USSR Annual State Award on Science and Technology (1987), the IFAC Outstanding Service Award (1990) and the Large Mente et Manu Medal of Tallinn Technical University (1992). Announcement of his being awarded the Estonian 3<sup>rd</sup> class White Cross Order reached him on his last days.

Boris was a charming and versatile personality, interested in music and sports, an excellent amateur actor and pianist, a devoted tennis and basketball player. Boris will be missed by his friends and colleagues.

Rein Küttner

## **Programmable Devices and Systems PDS2001**

### **5<sup>th</sup> IFAC Workshop**

#### **Gliwice, Poland**

#### **November 22 – 23, 2001**

Starting from the 4<sup>th</sup> event in the series, i.e. PDS2000 organised by the VSB, Department of Measurement and Control and held in Ostrava, the PDS meetings attained the status of IFAC Workshop. The very high esteem of the IFAC greatly contributed to the publicity of the event.

The PDS2001 IFAC Workshop, organised again by the Institute of Electronics, SUT, Gliwice, Poland and held in November 22-23, 2001, was the 5<sup>th</sup> event in the series. The IFAC Technical Committees: TC on Components and Instruments and TC on Safety of Computer Control Systems were, similarly as for the previous meeting in Ostrava, correspondingly the Workshop sponsor and co-sponsor. Their TC Chairs: Prof. Serge Boverie and Prof. Janusz Zalewski were the International Programme Committee (IPC) members.

The PDS2001 IFAC Workshop scope, as announced in the call for papers, was the following:

#### Industrial Programmable Controllers:

- High Effective CPU Structures
- Special Purpose Modules
- Sensors and Measurement Transducers
- Control Program Representation Methods
- SCADA Systems
- Safety Critical Applications
- Innovative Industrial Applications
- Industrial LANs

#### Field Programmable Logic (PLD, CPLD, FPGA) and High End Design Means:

- New Programmable Logic Devices
- Supporting Tools for Digital Circuit Design Using Programmable Devices
- High Level Synthesis

- Partitioning
- Emulation of Digital Circuits Using Programmable Devices
- Innovative Applications of Programmable Devices
- Built-in Test Circuits and Architectures
- Behavioural Failure Modelling
- Analogue and Mixed-Signal Circuits Design and Testing

#### Microprocessor Systems and Single-chip Microcomputers:

- Single-Chip Microcomputer Architectures
- Multiprocessor Systems
- Design Tools and Application Software
- Microprocessor Based Control Systems
- Emulators and Simulators
- Hardware-Software Co-Design
- Safety Critical Systems

#### Digital Signal Processing:

- DSP Algorithms and Architectures
- Innovative DSP Applications
- Embedded DSP Systems
- A/D and D/A Converters
- Neural Signal Processors
- Wavelets and Wavelet Transformations

#### Communication:

- Compression and Error Correction Codes
- Cryptography
- Remote Testing of Communication Systems
- High Reliable Systems
- Fault-Tolerant Circuits and Systems
- Quality of Communication Services

From the 70 preliminarily registered contributions, the National Organising Committee (NOC) finally received 66 papers from 13 countries. The IPC members have reviewed all submitted papers and accepted 58 of them for presentation. The people from universities and research centres prepared the greater part of the papers. However the people from industry (as authors or co-authors) submitted 9 papers, which were assigned as regular or poster. The next event organisers have to make every effort possible, however, to increase the presence from industry.

Registration, papers submission and reviewing operations were done electronically through the web. The organisers prepared the Preprints volume and distributed it on the spot.

The accepted papers were scheduled to the following eight regular sessions in the final Workshop programme

- 1 session on Communication
- 1 session on DSP
- 3 sessions on PLD (including 1 on PLD Testing)
- 3 sessions on PLC

In addition one poster session took place. After the opening paper presented by Prof. Krac̄niewski the Workshop sessions were held in parallel in two lecture halls. Each paper on the average was presented in some 20 minutes including the discussion. 16 papers were scheduled as posters and presented during the single poster session in the afternoon of the first day.

The microprocessor applications were defined as separate topic in the Call for Papers. Such papers were hardly distinguishable, so they were assigned to the PLC (Programmable Logic Controllers) or DSP (Digital Signal Processing). Some of the PLD papers formed clearly distinguishable groups concerning the PLD testing problems. They were assigned to the separate session.

Four of the accepted papers were not presented because their authors were absent with no convincing explanations to the NOC.

Among the most interesting ideas presented the following can be mentioned:

- the new approach to the FPGA delay faults testing (A.Krasniewski);
- the new designs of the PLCs (Koziolek and Landryova, Milik and Hryniewicz);
- the logic circuits partitioning methods for implementation in FPGA (Buciak et al., Chapenko et al., Tomaszewicz);
- the methodology of software reuse for the hardware design (Forczek);
- the new web oriented sensor/actuator interfaces (Cach et al.).

The discussions during the regular sessions presentations, and especially during the poster session were very interesting and heated. The results of those discussions were included in the final versions of the papers, which in some 10 cases were modified as compared to the Preprints volume versions.

The Proceedings volume, now under preparation at the Elsevier, will contain the 54 presented papers. They are grouped according to the main Workshop topics, as they appeared in the final programme of the Workshop. However the 15 papers presented in the poster session are added to their subject groups to express the fact that, in the opinion of the IPC, they are of the similar value.

We hope that it is not only our belief that discussion during the sessions was fruitful and staying in Gliwice interesting for the participants of the Workshop.

Edward HRYNKIEWICZ, IPC Chair  
Wladislaw CIAZYŃSKI, NOC Chair

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## **Automation in Mining, Mineral and Metal Processing - MMM2001** **10<sup>th</sup> IFAC Symposium** **Tokyo, Japan, 4-6 September 2001**

The 10<sup>th</sup> IFAC Symposium on Automation in Mining, Mineral and Metal Processing (MMM2001) was held from 4 to 6 September 2001 at the Waseda University International Conference Center, Tokyo, Japan. The symposium was sponsored by the IFAC Technical Committee on Automation in Mining, Mineral and Metal Processing. It was organized by the Iron and Steel Institute of Japan, on behalf of the Division Committee for Automatic Control Science & Technology of the Science Council of Japan. The aim of the symposium was the same as that of its nine predecessors: to review the-state-of-the-art and to look at innovations in the field of automation in mining, mineral and metal processing. In common with any other engineering fields, the environmental problems were highlighted.

At the opening ceremony, addresses were given by S. Asai, Vice-President of the Iron and Steel Institute of Japan, by K. Furuta, on behalf of the Science Council of Japan, by S.-L. Jamsa-Jounela, Chair of the Technical Committee, and by M. Araki, Chair of the International Program Committee.

The 16 technical sessions, which included the 3 organized sessions, were compiled from 73 regular papers in 2 parallel sessions (there were 3 papers whose authors did not show up at the symposium). The technical program was strong both in basic technologies such as modeling, identification, estimation, control, fault diagnosis, scheduling and optimization and in practical use of those technologies in specific areas such as flotation, casting, steel making, iron making, hot rolling and metal processing. Also the program, reflecting recent change of and interest in the field, included the session on environment and recycling. Approximately 50% of the papers presented were from industries or corporations between industries and academic institutions.

Every morning the symposium started with the plenary lecture session. The three plenary speakers and their topics were as follows. "Development of current control technologies in steel rolling from the viewpoint of a rolling engineer" was presented by I. Yarita (Chiba Institute of Technology, Japan). "Future trends in automation in mineral and metal processing" was given by S.-L. Jamsa-Jounela (Helsinki University of Technology, Finland). W.L. Dalmijn (Delft University of Technology, The Netherlands) presented "Recycling: the role of automation in the resource cycle". The organizers were honored to have 3 distinguished speakers.

The panel discussion was led by K. Asano (Kawasaki Steel Corporation, Japan) with the title "How to keep control systems effective?". The post-symposium technical visit to the Chiba Plant of Kawasaki Steel Corporation followed.

The organizers would like to express their gratitude to all the contributors. We hope that the MMM2001 was useful and rewarding to all the participants.

Kenko Uchida  
Chair of NOC

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## **Accelerator and Large Experimental Physics Control Systems** **International Conference** **San Jose, CA, USA** **27 - 30 November 2001**

ICALEPCS'2001, the eighth biennial International Conference on Accelerator and Large Experimental Physics Control Systems, was held in San Jose, California (27 - 30 November 2001). It was hosted by SLAC. The Conference Chair was Rusty Humphrey (SLAC) and the Programme Chair was Hamid Shoaei (SLAC).

ICALEPCS'2001 brought together 270 control specialists from 24 different nations covering Africa, America, Asia and Europe and representing 62 laboratories and 7 corporations. The attendance was lower than that of both ICALEPCS'99 (Trieste; 400 participants, 32 nations, 116 organisations) and ICALEPCS'97 (Beijing; 437 participants, 26 nations, over 100 organisations), which was a direct consequence of the 11 September 2001 terrorist attacks in the United States. There were around 120 participants at the three workshops on Databases, EPICS, and Automated Beam Steering.

The 2001 EPCS prize was awarded to Mark Plesko (Jozef Stefan Institute, Ljubiana)

### **Scope**

As usual, ICALEPCS'2001 covered the fields of control and operation of particle accelerators, detectors, telescopes, fusion devices, nuclear reactors and other large experimental facilities. Both hardware and software aspects of control systems were addressed. The conference was complemented by three workshops:

International Accelerator Data Base Group (IADBG) Workshop (1 December 2001), organized by Roland Müller (BESSY),

Automated Beam Steering and Shaping (ABS) Workshop (3 - 4 December 2001), organized by Greg White (SLAC),

Experimental Physics and Industrial Control Systems (EPICS) Workshop (3 - 4 December 2001), organized by Bob Dalesio (LANL)

### General Impressions

A wide range of topics was covered. Oral papers often referenced other related presentations (oral or poster).

There were a number of contributions (many of them first-time) from non-accelerator facilities:

Fusion: NIF (National Ignition Facility), NSTX (National Spherical Torus Experiment),

Astronomy: ESO's VLT (Very Large Telescope), CEA's VISIR Instrument, Gemini-South telescope, OAS (Osservatorio Astronomico di Capodimonte),

Interferometers: ALMA (Atacama Large Millimetre Array), LIGO (Laser Interferometer Gravitational Wave Observatory),

Experiments: ATLAS and CMS (CERN), BABAR (SLAC), D0 and CDF (FNAL), H1 (DESY), KLOE (DAPHNE).

Noteworthy was the increased level of collaboration across different controls projects: e.g. SNS (Spallation Neutron Source), SLS (Swiss Light Source), VIMOS (Visible Multi-Object Spectrograph), NSTX (National Spherical Torus Experiment), etc. These collaborations incorporate a common development environment and emphasize the re-use of packages, modules, designs, experience, etc.

There were very few papers on commercial controls. Examples that were presented include ATLAS (Argonne Tandem Linear Accelerator System) using VSystem, CMS (CERN) and H1 (DESY) both using PVSS II and DAFNE using LabVIEW. CERN, a pioneer in the use of commercial control systems, contributed only marginally to this conference (an aftermath of 11 September 2001!).

A. Daneels, R. Humphrey

## Control Engineering Practice

### Papers from the February 2002 Issue

Robust Control of Vertical Motions in Ultra-high Rise Elevators  
(S.R. Venkatesh, Y.M. Cho, J. Kim)  
Optimal Control of Hybrid Dynamical Systems: Application in Process Engineering  
(P. Manon, C. Valentin-Roubinet, G. Gilles)  
Solution to the Shell Standard Control Problems Using Genetically Tuned PID Controllers  
(C. Vlachos, D. Williams, J.B. Gomm)  
A Self-adjusting Active Compliance Controller for Multiple Robots Handling an Object  
(C. von Albrichsfeld, H. Tolle)  
Emergency Load-shedding Algorithm for Large Industrial Plants  
(P. Pincetti)  
A Multivariable Regulator Approach to Traffic-response Network-wide Signal Control  
(C. Diakaki, M. Papageorgiou, K. Aboudolas)  
Modeling and Cycling Control of Carbonate Fuel Cell Power Plants  
(M.D. Lukas, K.Y. Lee, H. Ghezel-Ayagh)  
Fault Diagnostics Using Sliding Mode Techniques  
(K.B. Goh, S.K. Spurgeon, N.B. Jones)  
State and Parameter Estimation in Biotechnical Batch Reactors  
(K.J. Keesman)  
Prediction Models for the Corrosion Phenomena in Pulp & Paper Plant  
(M. Bucolo, L. Fortuna, M. Nelke, A. Rizzo, T. Sciacca)  
Book Review  
(G. Dodds)

### Papers from the March 2002 Issue

Stochastic Optimization Based Control of Boundary Layer Transition  
(W. MacCormack, O.R. Tutty, E. Rogers, P.A. Nelson)  
Robustness Analysis of an Integrated Flight and Propulsion Control System Using @m and the @n-gap Metric  
(S.L. Gatley, D.G. Bates, M.J. Hayes, I. Postlethwaite)  
Minimally Invasive Estimation of Systemic Vascular Parameters for Artificial Heart Control  
(Y.-C. Yu, J.R. Boston, M.A. Simaan, J.F. Antaki)  
A System Approach for Control Development of Lower-limbs Training Machines  
(S. Moughamir, J. Zaytoon, N. Manamanni, L. Afilal)  
Application of Minimum Crest Factor Multisinusoidal Signals for "Plant-friendly" Identification of Nonlinear Process Systems  
(M.W. Braun, R. Ortiz-Mojica, D.E. Rivera)  
MIMO Closed-loop Identification of an MSW Incinerator  
(M. Leskens, L.B. M. Van Kessel, P.M.J. Van den Hof)  
Robust Observer-based Monitoring of a Hydraulic Actuator in a Vehicle Power Transmission Control System  
(J.-O. Hahn, J.-W. Hur, Y.M. Cho, K.I. Lee)  
Parameter-dependent Lyapunov Functions Applied to Analysis of Induction Motor Stability  
(S. Cauet, L. Rambault, O. Bachelier, D. Mehdi)  
Experimental Investigation of Human and Machine-Vision Arrangements in Inspection Tasks  
(C. Sylla)

### Papers from the April 2002 Issue

Two-valve Control of a Large Steam Turbine  
(W. Bolek, J. Sasiadek, T. Wisniewski)  
Impedance Control of a Robotic Gripper for Cooperation with Humans

(A.Dutta, G. Obinata)  
 Crone Control of a Nonlinear Hydraulic Actuator  
 (V. Pommier, J. Sabatier, P. Lanusse, A. Oustaloup)  
 Case Studies on Closed-loop Identification for MPC  
 (Y. Zhu, F. Butoyi)  
 Distributed Quantitative and Qualitative Fault Diagnosis: Railway Junction Case Study  
 (C. Roberts, H.P.B. Dassanayake, N. Lehasab, C.J. Goodman)  
 Special Section on Future Trends in Automation in Mineral and Metal Processing  
 (I.K. Craig)  
 Expert Control and Fault Diagnosis of the Leaching Process in a Zinc Hydrometallurgy Plant  
 (M. Wu, JH.-H. She, M. Nakano, W. Gui)  
 Level Control of Cascade Coupled Flotation Tanks  
 (B.Stenlund, A. Medvedev)  
 A Simulation Study of Coal Blending Control Using a Fuzzy Logic Ash Monitor  
 (S. Cierpisz, A. Heyduk)  
 Current Control of a Three-phase Submerged Arc Ferrosilicon Furnace  
 (A.S. Hauksdottir, A. Gestsson, A. Vesteinsson)  
 Motion Control of Liquid Container Considering an Inclined Transfer Path  
 (K. Yano, S. Higashikawa, K. Terashima)  
 Application of Neural-network for Improving Accuracy of Roll-force Model in Hot-rolling Mill  
 (D. Lee, Y. Lee)

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## Automatica

### Papers from the May 2002 Issue

#### Papers

Continuous Pole Placement Method for Delay Equations  
 (W. Michiels, K. Engelborghs, P. Vanservenant, D. Roose)  
 Some Facts about the Choice of the Weighting Matrices in Larimore Type of Subspace Algorithms  
 (D. Bauer, L. Ljung)  
 Controllability and Reachability Criteria for Switched Linear Systems  
 (Zhendong Sun, S.S. Ge, T.H. Lee)  
 Comparing Different Approaches to Model Error Modelling in Robust Identification  
 (W. Reinelt, A. Garulli, L. Ljung)  
 Subspace Identification of Multivariable Linear Parameter-varying Systems  
 (V. Verdult, M. Verhaegen)

#### Brief Papers

Predictive Congestion Control of ATM Networks: Multiple Sources/Single Buffer Scenario  
 (S. Jagannathan, J. Talluvi)  
 An Iterative Learning Algorithm for Boundary Control of a Stretched Moving String  
 (Zhihua Qu)  
 Hopf Bifurcation in Indirect Field-oriented Control of Induction Motors  
 (F. Gordillo, F. Salas, R. Ortega, J. Aracil)  
 Tracking in a Class of Nonminimum-phase Systems with Nonlinear Internal Dynamics via Sliding Mode Control Using Method of System Center  
 (I.A. Shkolonikov, Y.B. Shtessel)  
 Limiting Zero Distribution of Sampled Systems  
 (Er-Wei Bai, Y.-Q. Wu)  
 Identification of Linear Systems with Hard Input Nonlinearities of Known Structure  
 (Er-Wei Bai)  
 Identification of Positive Linear Systems with Poisson Output Transformation  
 (A.de Santis, L. Farina)

#### Technical Communiques

Improving an Adaptive Controller for Non-minimum Phase Plants  
 (Jing Yuan)  
 Superposition in Efficient Robust Constrained Predictive Control  
 (Young Il Lee, B. Kouvaritakis)  
 Who Needs QP for Linear MPC Anyway?  
 (B.Kouvaritakis, M. Cannon, J.A. Rossiter)  
 On Delay Robustness Analysis of a Simple Control Algorithm in High-speed Networks  
 (S.I. Niculescu)  
 Analytical Stability Bound for Delayed Second Order Systems with Repeating Poles Using Lambert Function W  
 (Y. Chen, K.L. Moore)  
 Effects of Small Delays on Stability of Singularly Perturbed Systems  
 (E. Fridman)  
 Modified AIC Rule for Model Selection in Combination with Prior Estimated Noise Models  
 (J. Schoukens, Y. Rolain, R. Pintelon)

**Book Reviews**

Robust Control and Filtering for Time-delay Systems, by M.S. Mahmoud and M. Dekker  
(Q.-C. Zhong)  
Model Reduction for Control System Design, by G. Obinata and B.D.O. Anderson  
K. Zhou  
Essentials of Robust Control, by K. Zhou and J.C. Doyle  
(L. Qiu)

**Papers from the June 2002 Issue****Editorial**

Harold Chestnut, First IFAC President  
(S. Kahne)

**Papers**

Rate-based Flow Controllers for Communication Networks in the Presence of Uncertain Time-varying Multiple Time Delays  
(A. Quet, B. Ataslar, A. Iftar, H. Özbay, S. Kalyanaraman, T. Kang)  
A Time Aggregation Approach to Markov Decision Processes  
(X.-R. Cao, Z. Ren, S. Bhatnagar, M. Fu, S. Marcus)  
Robust Output Feedback Stabilization via Risk-sensitive Control  
(V.A. Ugrinovskii, I.R. Petersen)  
A Convex Approach to Robust H<sub>2</sub> Performance Analysis  
(M. Sznaier, T. Amishima, P.A. Parillo, J. Tiesno)  
A Blind Approach to the Wiener-Hammerstein Model Identification  
(E.-W. Bai)  
Analytical Structures and Analysis of the Simplest Fuzzy P1 Controllers  
(A. V. Patel, B.M. Mohan)  
High-gain Feedback Control of Rotating Stall in Axial Flow Compressors  
(M.A. Mayfeh, E.H. Abed)  
Adaptive Differential Dynamic Programming for Multiobjective Optimal Control  
(L.-Z. Liao, D. Li)

**Brief Papers**

Suboptimal Markovian Smoothing Estimates Based on Continuous Curves of Solutions of the Algebraic Riccati Equation Inequality  
(M. Pavon, H.K. Wimmer)  
An Adaptive Control Scheme for Systems with Unknown Actuator Failures  
(Gang Tao, S. Chen, S.M. Joshi)  
Recursive 4SID Algorithms Using Gradient Type Subspace Tracking  
(H. Oku, H. Kimura)  
Interaction Bounds in Multivariable Control Systems  
(K.H. Johansson)  
Analysis of Dual-rate Inferential Control Systems  
(D. Li, S.L. Shah, T. Chen)  
Optimizing the End-point State-weighting Matrix in Model-based Predictive Control  
(H.H.J. Bloemen, T.J.J. van den Boom, H.B. Verbruggen)  
Design and Analysis of Discrete-time Robust Kalman Filters  
(Xing Zhu, Yeng Chai Soh, L. Xie)

**Technical Communiques**

Nonlinear Bounded-error State Estimation of Continuous-time Systems  
(L. Jaulin)  
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