# Institute of Control
# and Computation Engineering

# 2000 Annual Report

## *From the Director*

The Institute of Control and Computation Engineering (ICCE, Polish: Instytut Automatyki i Informatyki Stosowanej) was created in 1955 as the Chair of Automatic Control and Telemechanics by Professor Władysław Findeisen. It was reorganized in 1970 to the Institute of Automatic Control. Rapid development of microprocessor technology and its impact on the field of control in recent years directed the interest of staff and students towards computational and algorithmic aspects of control, decision support, man-machine interfacing, etc. This resulted in creation of new educational profiles offered by the Institute and a change of its name to the present one in 1994. Professor Władysław Findeisen has been the Director of the Institute until he was elected the Rector of the Warsaw University of Technology in 1981. His achievements are recognized not only in Poland. He is Doctor Honoris Causa of the City University London, Warsaw University of Technology, Technical University of Gdańsk, and Technical University of Ilmenau.

The Institute offers education possibilities in a broad area of information technology for control and decision support systems, at three levels of education. At the first level (equivalent to B.Sc.) the degree programs are offered in Computer Control Systems and Information Systems for Decision Support, which combine courses from areas of control and computer science. Two M.Sc. degree programs are offered, namely in Computer Science and in Control Systems. We are also proud to be able to offer interesting possibilities to our postgraduates for continuation of their study and research towards Ph.D.

Certainly, research is a very important part of our staff activities, directly affecting both Institute's recognition in Poland and abroad, and the quality of teaching. Description of research programs conducted by the staff of the Institute can be found in this report. I would like to stress, among others, activity of the University Center for Control and Information-Decision Technology with Professor Krzysztof Malinowski as the Director.

I express my sincere appreciation to all of the staff of the Institute for their efforts and contributions to our achievements in teaching and research. I would like also to express my gratitude to all our partners from abroad, in particular to those actively participating in international research programs. We will appreciate a feedback from our partners concerning our activities and this report itself. We will be glad to answer any and all questions and we will be pleased to send reprints of our papers and reports upon request.

*Piotr Tatjewski*

# 1 General Information

## 1.1 Board of Directors

Professor Piotr Tatjewski, Director
Dr. Andrzej Pacut, Deputy Director for Research
Dr. Jerzy Paczyński, Deputy Director for Academic Affairs

## 1.2 Organization of the Institute

**Control and Systems Division**

| | |
|---|---|
| Division Head: | Professor Krzysztof Malinowski. |
| Faculty and staff: | |
| *Professors:* | Anatol Gosiewski (part-time), Władysław Findeisen (emeritus), Krzysztof Malinowski, Piotr Tatjewski, Krzysztof Sacha, Cezary Zieliński; |
| *Assistant Professors:* | Agnieszka Bogobowicz, Paweł Domański (part-time), Andrzej Karbowski, Włodzimierz Kasprzak, Tomasz J. Kruk, Ewa Niewiadomska-Szynkiewicz, Krzysztof Nowosad (deceased December 4, 2000), Andrzej Pacut, Stefan Romicki, Adam Woźniak, Wojciech Szynkiewicz; |
| *Senior Lecturers:* | Jerzy Gustowski, Zygmunt Komor, Andrzej Rydzewski; |
| *Assistants:* | Marek Brudka, Krzysztof Kierzenkowski; |
| *Lecturer:* | Michał Warchoł; |
| *Senior R& D Engineers:* | Urszula Kręglewska, Piotr Misiurewicz (part-time), Jerzy Pułaczewski; |
| *Software Engineers:* | Włodzimierz Macewicz (senior grade), Piotr Bolek. |

Research of the division is conducted in 4 research groups:

**Control and Optimization of Complex Systems Group** (***K. Malinowski***, *A. Bogobowicz, W. Findeisen, A. Karbowski, E. Niewiadomska-Szynkiewicz, A. Pacut, M. Warchoł, A. Woźniak*)

The main area of interest is the theory and methodology of model-based predictive repetitive control and hierarchical control structures for non-linear systems under uncertainty, methods for solving continuous and discrete time optimization problems, and software for computer aided analysis and design of complex systems. Particular attention is given to distributed and parallel, synchronous and asynchronous, computations. Application oriented research is being presently focused on pricing on computer network services, on network access control and security measures.

**Process Control Group** (***P. Tatjewski***, *P. Domański, J. Gustowski, Z. Komor, K. Nowosad (deceased December 4, 2000), J. Pułaczewski, S. Romicki, A. Rydzewski, P. Misiurewicz, U. Kręglewska*)

The research is concerned with industrial process control. The focus is on predictive and fuzzy control algorithms, multilayer optimizing and supervisory control, and non-linear system control and analysis. Soft computing methods for design and tuning of control systems are developed, including those base on fuzzy neural nets, neural nets and genetic algorithms. Theoretical considerations are combined with simulation analysis and investigations. Computer Control Systems Laboratory features laboratory-scale processes and is equipped with programmable controllers, industrial computers and workstations with software tools, including professional SCADA and soft control systems.

## Robot Control and Programming Group (*W. Szynkiewicz, M. Brudka, A. Gosiewski, W. Kasprzak, K. Kierzenkowski, C. Zieliński*)

Research is concerned with robot motion planning and control systems, autonomous mobile robot localization and navigation, robot programming languages, and computer vision systems. In the robot control systems area research is focused on new motion and force/position control algorithms for multi-robot systems. Special emphasis is given to the sensor-based motion planning and control of the single and multiple articulated or mobile robots. In the computer vision and signal processing (speech analysis) area the research is concentrated on autonomous navigation, transportation and security relevant environments.

## Software Engineering Group (*K. Sacha, P. Bolek, T.J. Kruk, W. Macewicz*)

Software Engineering Group deals with software development technology, with the emphasis on software specification and design methods for real time applications and distributed operating systems. The research interests also comprise the cluster processing problems and the design of distributed internet-based applications. The examples of research projects include the application of Petri nets to the modeling and verification of software, the design of dependable distributed systems with resource redundancy and task migration, and electronic transfer of documents through the internet.


## Operations Research and Management Systems Division

Division Head:                  Professor Eugeniusz Toczyłowski.

Faculty and staff:

*Professor:*                    Eugeniusz Toczyłowski;
*Assistant Professors:*         Krzysztof Pieńkosz, Grzegorz Płoszajski, Tomasz Sikorski (part-time), Cezary Szwed, Tomasz Traczyk.


The research is concerned with operation research and structural discrete optimization methods for control and management of discrete processes, including applications in the deregulated electric power industry, computer integrated manufacturing and educational systems. The research is focused on scheduling techniques, efficient structural-based optimization algorithms, time-table generation, strategic and tactical planning, detailed scheduling, and real-time operational control. Also, the object oriented and relational database management systems and CASE methods are applied to design distributed multi-functional heterogeneous information systems.


## Optimization and Decision Support Division

Division Head:                  Professor Wiesław Traczyk.

Faculty and staff:

*Professors:*                   Wiesław Traczyk, Andrzej Wierzbicki (part-time), Włodzimierz Ogryczak;
*Assistant Professors:*         Janusz Granat, Jerzy Paczyński, Andrzej Stachurski;
*Senior Lecturer:*              Tadeusz Rogowski (part-time);
*Lecturer:*                     Jerzy Sobczyk (part-time);
*Software Engineer:*            Grzegorz Wójcik (part-time).

Research of the division is focused on the theory of distributed and parallel computational methods, and software for optimization. The theory covers a whole area of linear and non-linear, dynamic, stochastic and multiple criteria problems, and deals with such topics as the sensitivity aspects and the parametric aspects. Another area covers the decision theory, including the multi-person decisions and the game theory, and deals with software building for decision support and organization and management of computer networks. Also, research is carried on the methods of learning, data mining and reasoning in expert systems.

## 1.3 Statistical Data

| FACULTY and STAFF | 1998 | | 1999 | | 2000 | |
|---|---|---|---|---|---|---|
| | persons | FTE | persons | FTE | persons | FTE |
| **Academic Staff** | 35 (+2) | 32.05(+2) | 33(+3) | 30.90(+3) | 34(+2) | 30.62 (+2) |
| by titles/degrees | | | | | | |
|   Professors | 5 (+2) | 3.65 (+2) | 4 (+2) | 3(+2) | 4(+1) | 2.83(+1) |
|   D.Sc.-s | 6 | 6 | 5 (+1) | 5 (+1) | 5(+1) | 5(+1) |
|   Ph.D.-s | 18 | 17.4 | 18 | 17.9 | 19 | 17.90 |
|   M.Sc.-s | 6 | 5 | 6 | 5 | 6 | 4.90 |
| by positions | | | | | | |
|   Professors | 8 (+1) | 6.65 (+1) | 7 (+2) | 6 (+2) | 8(+2) | 6.83(+2) |
|   Associate Professors | 1 (+1) | 1 (+1) | (+1) | (+1) | 0 | 0 |
|   Assistant Professors | 19 | 17.4 | 17 | 16.9 | 18 | 16.90 |
|   Senior Lecturers | 4 | 3.5 | 4 | 3.5 | 4 | 3.5 |
|   Lecturers | 1 | 0.5 | 1 | 0.5 | 2 | 1.40 |
|   Assistants | 2 | 2 | 4 | 4 | 2 | 2 |
| **Ph.D. Students** | 39 | 39 | 36 | 36 | 32 | 32 |
| **Technical Staff** | 11 | 8.5 | 12 | 9.3 | 12 | 9.3 |
| **Administrative Staff** | 6 | 6 | 6 | 6 | 6 | 5.75 |

$FTE$ – Full Time Employment units,
$+$ – corrections due to persons on long-time leave of absence

| ACTIVITIES | 1998 | 1999 | 2000 |
|---|---|---|---|
| **Teaching activities** | | | |
|   standard teaching potential, hours | 7544 | 7064 | 7261 |
|   # hours taught | 15226 | 15361 | 16016 |
| **Degrees awarded** | | | |
|   D.Sc. | 0 | 0 | 1 |
|   Ph.D. | 0 | 3 | 5 |
|   M.Sc. | 30 | 33 | 49 |
|   B.Sc. | 2 | 8 | 26 |
| **Research projects** | | | |
|   granted by WUT | 21 | 22 | 10 |
|   granted by State institutions | 8 | 5 | 0 |
|   granted by international instutions | 1 | 1 | 1 |
|   other | 2 | 4 | 0 |
| **Referred publications** | | | |
|   monographs | 1 | 0 | 3 |
|   textbooks | 0 | 1 | 0 |
|   chapters in books | 0 | 1 | 13 |
|   papers in journals | 17 | 15 | 10 |
|     *international* | *8* | *10* | *10* |
|     *local* | *9* | *5* | *0* |

| ACTIVITIES | 1998 | 1999 | 2000 |
|---|---|---|---|
| papers in conference proceedings | 30 | 30 | 42 |
| *international* | *24* | *14* | *20* |
| *local* | *6* | *16* | *22* |
| other publications | 24 | 24 | 9 |
| **Reports** | 18 | 45 | 21 |
| **Conferences** | | | |
| participated (# of conferences) | 39 | 17 | 29 |
| participated (# of part. from ICCE) | 78 | 38 | 62 |

| RESOURCES | 1998 | 1999 | 2000 |
|---|---|---|---|
| **Space (sq.m.)** | | | |
| laboratories | 473.6 | 585 | 585 |
| library + seminar room | 98 | 73.6 | 73.6 |
| faculty offices | 767.4 | 724 | 724 |
| **Computers** | | | |
| workstations* | 8 | 44 | 20 |
| personal computers* | 150 | 160 | 222 |
| **Library resources** | | | |
| books | 4127 | 4265 | 4385 |
| booklets | 862 | 1085 | 1276 |
| journals subscribed | 5 | 6 | 6 |

*Classification into workstations and personal computers changes due to modification of technical standards.

# 2 Faculty and staff

## 2.1 Professors Emeriti

**Władysław Findeisen** Professor, Control and Systems Division.

room 524
tel. 660 7397 and 825 0995
W.Findeisen@ia.pw.edu.pl

M.Sc. 1949, Ph.D. 1954. Full Professor since 1962.

Founder and Director of ICCE (1955–1981), elected and re-elected Rector of WUT (1981–1985). Member of Polish Academy of Sciences (PAN) since 1971. Doctor Honoris Causa of The City University in London (1984), Warsaw University of Technology (1996), Gdańsk University of Technology (1997), Technische Universität Ilmenau (1998). Chairman of the Social Council to the Primate of Poland (1986–90), Vice-President of the Polish Academy of Sciences (PAN)(1990–1992), Senator of the Republic of Poland (1989–93), President of "Kasa Mianowskiego" (a foundation which sponsors foreign scientists in Poland) (since 1991), Vice-President of the Polish Commitee for UNESCO (since 1999). Retired since July 1999.

**Radosław Ładziński** Professor, Control and Systems Division.

room 570
tel. 660 7648
R.Ladzinski@ia.pw.edu.pl

M.Sc. 1952, Ph.D. 1957 from WUT. The title of Professor of Technical Sciences awarded in 1968. Retired since January 1998.

Publications: [J5]

**Jacek Szymanowski** Professor, Control and Systems Division.

room 530
tel. 660 7922
J.Szymanowski@ia.pw.edu.pl

M.Sc. 1962, Ph.D. 1966, D.Sc. 1983 from WUT.

With WUT since 1968. Visiting Professor, Laboratoire d'Automatique de Nantes, Ecole Centrale de Nantes, France, 1992, 1994, 1995, 1996, 1997. Retired since January 1999.

Interests: simulation of control systems, linear and nonlinear programming, control applications of optimization techniques, operating systems.

## 2.2 Senior Faculty

By Senior Faculty we understand Professors, Associate Professors, Assistant Professors, and Senior Lecturers. In project participation lists, the reader is referred to the project listing in Chapter 4. Project leaderships are listed in bold.

**Agnieszka Bogobowicz**  Assistant Professor, Control and Systems Division.

room 570
tel. 660 7648
A. Bogobowicz@ia.pw.edu.pl

M.Sc. 1976 from WUT, Ph.D. 1987 from Polish Academy of Sciences.

In 1976 she was appointed by the Institute of Meteorology and Water Management. In 1981 the team was moved to the Institute of Geophysics of the Polish Academy of Sciences. Between 1988 and 1992 she was a Visiting Assistant Professor in the Departments of Civil Engineering and Earth Sciences of the University of Waterloo, Canada. In 1992 she was offered a regular appointment of an Assistant Professor in the Department of Systems Design Engineering of the University of Waterloo. She held the post until 1996. In 1991 she worked at Ecole Polytechnique, France (CNRS grant was obtained). From 1996-1998 she held the posts of an Assistant Professor at the Polish-Japanese Institute of Computer Techniques and the Institute of Biocybernetics and Biomedical Engineering of Polish Academy of Sciences. With WUT since 1998. She is a member of the Polish Mathematical Society, American Association for Advancement of Science, Polish Society of Applied Electromagnetism and the IEEE.

Interests: dynamic systems, scientific computing and information modeling.

Project participation: [P11, P12]

Publications: [IC3, IC4]

Reports: [A1, A2]

**Paweł Domański**  Assistant Professor, Control and Systems Division.

room 572a
tel. 660 7120
P. Domanski@ia.pw.edu.pl

M.Sc. 1991, Ph.D. 1996 from WUT.

With WUT since 1991, half time since 1997.

Interests: adaptive control, intelligent control, fuzzy logic.

Publications: [Ch1, Ch2, IC7, IC8, LC7]

**Anatol Gosiewski**  Professor, Control and Systems Division.

room 565
tel. 660 7750 and 825 5280
A.Gosiewski@ia.pw.edu.pl

Ph.D. 1959, D.Sc. 1964 from WUT; the titles of Professor of Technical Sciences awarded in 1972 and 1992.

With WUT since 1951. Post-Doctoral Fellow at Case Institute of Technology, Cleveland, Ohio (1961), Visiting Prof. at the Dept. of Electrical Eng. of University of Minnesota, Minneapolis, Minnesota (1975), Visiting Prof. at the Dept. of Mechanical and Aerospace Eng., of University of Delaware, Newark, Delaware (1979). Member of the State Committee for the Scientific Title and Scientific Degrees (1993–1996), member of the Committee on Automation and Robotics of Polish Academy of Sciences (PAN). Member of Scientific Council of Institute of System Research (IBS PAN) (since 1985), and of the Industrial Institute for Automation and Measurements (PIAP) (since 1983). Chairman of the Section of Automation and Robotics T11A of the State Committee for Scientific Research (KBN) (1991–1996), Member of Scientific Society of Warsaw (TNW) (since 1983). Head of ICCE Robotics Group (1986–1996) and then Robotics and Operation Research Division, Director of the Ph.D. Program in Automatic Control and Computer Science at EIT.

Interests: control theory, optimal control, robot dynamics and robot control.

**Janusz Granat**  Assistant Professor, Optimization and Decision Support Division.

room 25
tel. 6607640,
J.Granat@ia.pw.edu.pl

M.Sc. 1986, Ph.D. 1997 from WUT.

With WUT since 1987

Interests: decision support systems, multicriteria decision analysis, data warehouses, decision support in telecommunication industry.

Publications: [Ch3, Ch4, *J2] Reports: [A3]

**Jerzy Gustowski**  Senior Lecturer, Control and Systems Division.

room 525
tel. 660 7699
J.Gustowski@ia.pw.edu.pl

M.Sc. 1979 from WUT.

With WUT since 1979.

Interests: low level software for computer control, interfacing, single-chip microcomputers, PLC controllers.

Project participation: [P19]

**Andrzej Karbowski**  Assistant Professor, Control and Systems Division.

room 572
tel. 660 7632
A.Karbowski@ia.pw.edu.pl

M.Sc. 1983, Ph.D. 1990 from WUT.

With WUT since 1983. Research visitor, Politecnica di Milano and Universita di Genova, 1992, Edinburgh Parallel Computing Centre, 2000. Member of IEEE.

Interests: large scale systems, distributed computations, optimal control and management in risk conditions, decision support systems, neural networks, environmental systems management, control and decision problems in integrated services digital telecommunication networks.

Project participation: [P1, P3, P6]

Publications: [J6, IC5, IC10, IC11]

Reports: [R5]

**Włodzimierz Kasprzak**  Assistant Professor, Control and Systems Division.

room 554
tel. 660 7866
W.Kasprzak@ia.pw.edu.pl.

M.Sc. 1981, Ph.D. 1987 from WUT, Dr-Ing. 1997 from Univ. of Erlangen-Nuremberg.

With WUT since 1997. Member of Polish Section of IAPR.

Interests: computer vision, speech recognition, neural networks, autonomous navigation.

Project participation: [P4, P10, P25]

Publications: [B1, J3, J4]

Reports: [R6]

**Zygmunt Komor**  Senior Lecturer, Control and Systems Division.

room 571
tel. 660 7861
Z.Komor@ia.pw.edu.pl

M.Sc. 1964, Ph.D. 1976 from WUT.

With WUT since 1964.

Interests: automatic control, control instrumentation design and implementation.

**Tomasz J. Kruk**  Assistant Professor, Control and Systems Division.

room 530
tel. 660 7922
T.Kruk@ia.pw.edu.pl

M.Sc. 1994 from Technical University of Gdańsk. Ph.D. 1999 from WUT.

With WUT since 1999.

Interests: operating systems, distributed systems, IT secutity.

Unreferred publications: [UJ1]

**Krzysztof Malinowski**  Professor and Head, Control and Systems Division. Director of the Center for Control and Information-Decision Technology (from October 1, 1999).

room 517
tel. 660 7397 and 825 0995
K.Malinowski@ia.pw.edu.pl

M.Sc. 1971, Ph.D. 1974, D.Sc. 1978), the title of Professor of Technical Sciences awarded in 1989, appointed to ordinary professorship in 1994.

With WUT since 1971. Director of ICCE (1984–1996), Dean of the FEIT (1996–1999), Director of the Center for Control and Information-Decision Technology. Member of the Senate of the Warsaw University of Technology (since 1993), Chairman of the Senate Committee on Academic Staff (1993–1996 and 1999–2002), Chairman of Senate Committee on Research (1996–1999), Director of the University Priority Research Program in Control, Information Technology, and Automation (PATIA) (1994–1999). Correspondent Member of the Polish Academy of Sciences (PAN) (since 1998), Member of the Scientific Society of Warsaw (TNW). Member of Technical Sciences Group of the Ministry of National Education Expert Committee, Member of the Committee of Automation and Robotics of Polish Academy of Sciences (PAN), Member of the Scientific Council of the Industrial Institute for Automation and Measurement(PIAP), Member of the Council on Informatics to the Prime Minister of Poland, Member of the IFAC Technical Committee on Control.

Interests: hierarchical control, model-based predictive control of nonlinear systems, applications of optimization.

Project participation: [P1, P3, P21, P22]

Publications: [*J7, IC1, IC9]

**Ewa Niewiadomska-Szynkiewicz**  Assistant Professor, Control and Systems Division.

room 572
tel. 660 7632
E.Niewiadomska@ia.pw.edu.pl

M.Sc. 1986, Ph.D. 1995 from WUT.

Research Assistant at the Institute of Geophysics of Polish Academy of Sciences in (1987–1988), with WUT since 1988.

Interests: large scale systems, hierarchical control, computer simulation, computer aided control systems design, environmental systems management, decision support systems, distributed computations, global optimization, telecommunication systems.

Project participation: [P1, P3, P6, P17]

Publications: [IC15, IC16, LC15]

Reports: [R11, R12, R16, R17]

**Krzysztof Nowosad** M.Sc. 1973, Ph.D. 1979, D.Sc. 1997 from WUT.

With WUT since 1978. Research Fellow at the University of Manchester (1983–1984). Head of the Control Systems Laboratory since 1986. Member of the Dean's Committee for Research since 1999. Deceased on 4th December 2000.

**Włodzimierz Ogryczak** Professor, Optimization and Decision Support Division.

room 26
tel. 660 7862
W.Ogryczak@ia pw.edu.pl

M.Sc. 1973, Ph.D. 1983 in Mathematics from Warsaw University, D.Sc. 1997 in Computer Science from PAN.

With Warsaw University, Institute of Informatics 1973–2000, with WUT since 2000. H.P. Kizer Eminent Scholar Chair in Computer Science at Marshall University, USA (1989-1992), visiting professor at Service de Mathématique de la Gestion of Université Libre de Bruxelles, Brussels, Belgium (1994-1995). Member of INFORMS, International Society of MCDM.

Interests: theoretical research, computer solutions and interdisciplinary applications in the area of operations research, optimization and decision making with the main stress on: multiple criteria analysis and decision support, decision making under risk, linear, network and discrete programming, location and distribution problems.

Project participation: [P20]

Publications: [*J8, *J9, *J10, LJ1]

Reports: [A4, A5, R10, R13, R14]

**Andrzej Pacut** Assistant Professor, Control and Systems Division.

room 522
tel. 660 7733
A.Pacut@ia.pw.edu.pl

M.Sc. 1969, Ph.D. 1975, D.Sc. 2000 from WUT.

With Warsaw University of Technology since 1969, first with the Institute of Mathematics (until 1978) then with ICCE. Visiting Assistant Prof. at Lefschetz Center for Dynamical Systems of Brown University, Providence, RI (1980–1981), Visiting Associate Prof. at Oregon State University, Corvallis, OR (1984 and 1986–1991) Deputy Director of ICCE 1985–1986 and 1993 to present. Member of IEEE and INNS (Int. Neural Networks Society).

Interests: system identification, neural modeling, neural networks, learning systems, probabilistic modeling.

Project participation: [P9, P16, P21, P22, P23, P24]

Publications: [B2, IC5, IC17, IC18]

Reports: [R15]

**Jerzy Paczyński** Assistant Professor, Optimization and Decision Support Division.

room 22/23
tel. 660 7750 and 8255280
J.Paczynski@ia.pw.edu.pl

M.Sc. 1963 from WUT, M.Sc. in Mathematics 1973 from Warsaw University, Ph.D. 1974 from WUT.

With WUT since 1963. Deputy Director for Academic Affairs (since Sept. 1996).

Interests: modeling, modeling languages, transformations of formal languages — tools and applications, application of computer algebra and logic programming to systems theory and optimization.

Publications: [Ch7]

**Krzysztof Pieńkosz** Assistant Professor, Operations Research and Management Systems Division.

room 560a
tel. 660 7864
K.Pienkosz@ia.pw.edu.pl

M.Sc. 1984, Ph.D. 1992 from WUT.

With the Research Institute of Polish Gas and Oil Company 1984–1986, with WUT since 1986.

Interests: operations research in particular discrete optimization, combinatorial algorithms, production planning and scheduling in manufacturing systems.

Project participation: [P2]

Publications: [IC2]

**Grzegorz Płoszajski** Assistant Professor, Operations Research and Management Systems Division.

room 560a
tel. 660 7864
G.Ploszajski@ia.pw.edu.pl

M.Sc. 1968 from WUT, M.Sc. in Mathematics 1974 from Warsaw University, Ph.D. 1974 from WUT.

With WUT since 1969. Deputy Director for Information of the Main Library of WUT since 1996.

Interests: control and simulation of discrete production systems, e.g assembly lines, production management, quality management.

**Tadeusz Rogowski** Senior Lecturer (part time), Optimization and Decision Support Division.

rooms 530, 319GG
tel. 660 7922, 660 5392
T.Rogowski@ia.pw.edu.pl

M.Sc. 1972.

With WUT since 1972, Director of University Computer Center since 1989.

Interests: computer network, programming languages, operating systems.

**Stefan Romicki** Assistant Professor, Control and Systems Division.

room 571
tel. 660 7861
S.Romicki@ia.pw.edu.pl

M.Sc. 1962, Ph.D. 1970 from WUT.

With WUT since 1962.

Interests: automatic control, design of microprocessor devices, digital servomechanisms.

**Andrzej Rydzewski** Senior Lecturer, Control and Systems Division.

room 566
tel. 660 7649
A. Rydzewski@ia.pw.edu.pl

M.Sc. 1974 from WUT.

With WUT since 1974.

Interests: design of digital systems and microprocessor-based control and measurement systems.

Project participation: [P4]

**Krzysztof Sacha** Professor, Control and Systems Division.

room 562
tel. 660 7756
K.Sacha@ia.pw.edu.pl

M.Sc. (1973), Ph.D. (1976), D.Sc. (1996) from WUT.

With Minicomputer Research and Development Center ERA (1973), with WUT since 1976. Software Engineering Consultant for Industrial Automation Enterprise PNEFAL (1987–90), University of Groningen (1991–1992). Member of IEEE Computer Society.

Interests: software technology for real-time applications on software specification and design methods, distributed operating systems.

Project participation: [P13]

Publications: [LC8]

**Tomasz Sikorski** Assistant Professor, Operations Research and Management Systems Division.

room 555
tel. 660 7997
T.Sikorski@ia.pw.edu.pl

M.Sc. 1994 from WUT. Ph.D. 1999 from WUT.

With WUT since 1999.

Interests: operation research, discrete optimization, real time control.

Project participation:[P2]

**Andrzej Stachurski** Assistant Professor, Optimization and Decision Support Division.

room 25a
tel. 660 7640
A.Stachurski@ia.pw.edu.pl

M.Sc. 1976, Ph.D. 1980 from WUT.

Senior Assistant (1979–80) and then Assistant Professor (1980–92) at the Institute of System Research (IBS PAN), with WUT since 1992. Visiting Professor at the Calabria University, Italy, 1984, Äbo Swedish Academy in Turku, 1987, Jyväskylä University, Finland, 1988, JSPS invitee at the Department of Control Engineering, Osaka University, Japan, 1988–89. Member of Polish Society of Operations and Systems Research. Author and co-author of many scientific papers and reports on optimization algorithms, identification, applications of optimizations in macro-economy modeling and optimal design problems in structural engineering. Co-author of a textbook "Podstawy optymalizacji" ("Foundations of Optimization") published in 1999. Reviewer of Control&Cybernetics, Optimization, Archives of Control Science, SIAM J. on Optimization, IEEE Concurrency.

Interests: nonlinear programming, large-scale optimization, applications to the optimal design problems in structural engineering, parallel and distributed calculations in Mathematical Programming.

**Cezary Szwed** Assistant Professor, Operations Research and Management Systems Division.

room 555
tel. 660 7997
C.Szwed@ia.pw.edu.pl

M.Sc. 1993 from WUT. Ph.D. 1999 from WUT.

With WUT since 1999.

Interests: operation research, timetabling, discrete optimization, combinatorial algorithms.

Publications: [LJ2, LJ3]

**Wojciech Szynkiewicz** Assistant Professor, Control and Systems Division.

room 554
tel. 660 7866
W.Szynkiewicz@ia.pw.edu.pl

M.Sc. 1985, Ph.D. 1996 from WUT.

With WUT since 1985. Deputy Director of the Research Center for Control and Information-Decision Technology (since November, 1999).

Interests: multiple robots coordination, mobile robotics and artificial intelligence, robot motion space analysis and sensor based trajectory planning, real-time operating systems.

Project participation: [P4, P14, P21, P22, P25]

Publications: [IC19, IC14]

Reports: [R18]

**Piotr Tatjewski** Professor, Control and Systems Division. Director of the Institute.

room 521
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P. Tatjewski@ia.pw.edu.pl

M.Sc. 1972, Ph.D. 1976, D.Sc. 1988 from WUT.

With Warsaw University of Technology since 1972. Ph.D. in automatic control in 1976, D.Sc. in 1988. Head of Process Control Group since 1991, Deputy Director of ICCE for Academic Affairs (1987–1991), Director of ICCE since 1996. Head of the Undergraduate Degree Program in Computer Control Systems (1994-1996). DAAD scholarship in 1978 (TU Hanover), SERC research fellow at the City University, London (1986), visiting professor at the University of Birmingham (1992/1993). Member of the FEIT Board for Graduate Studies, Member of the FEIT Committee on the Faculty Structure and Organization. Member of the IFAC Education Committee.

Interests: multilayer control systems, process control and optimization, decomposition methods in optimization and control, soft computing methods.

Project participation: [P7, P8, P15, P21, P22] Publications: [IC12, IC13] Reports: [R20]

**Eugeniusz Toczyłowski** Professor and Head, Operations Research and Management Systems Division.

room 516
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E.Toczylowski@ia.pw.edu.pl

M.Sc. 1973, Ph.D. 1976, D.Sc. 1989 from WUT.

With WUT since 1973. Head of Operations Research and Management Systems Group, Vice-Dean of the Faculty of Electronics at WUT (1990–1993), chairman of the Rector's Committee for University Computerization (1993–1999), Advisor to the Dean on Strategic Planning (1993–1996). Head of the Undergraduate Program in Information Systems for Decision Support, Member of the Section on Decision Support of the Committee of Automation and Robotics of Polish Academy of Sciences.

Interests: structural approaches to discrete optimization, operations research and management, management information systems.

Project participation: [P2, P20, P21]

Publications: [LC1, LC2, LC6, LJ3, LC9, LJ4, LC10, LC5, LC6, LC7, LC11, LC12, LC14]

Reports: [A6, A7, R4]

**Tomasz Traczyk** Assistant Professor, Operations Research and Management Systems Division.

room 561
tel. 660 7123
T.Traczyk@ia.pw.edu.pl

M.Sc. 1984, Ph.D. 1992 from WUT.

With WUT since 1984.

Interests: database management systems (DBMS), applications of DBMS in management and control, fourth generation languages, CASE methods, information systems, Web-based and distributed systems, XML language and its applications.

Project participation: [P18]

Publications: [IC6, LC13]

Unreferred publications: [UJ2]

**Wiesław Traczyk** Professor and Head, Optimization and Decision Support Division.

room 523
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M.Sc. 1959, Ph.D. 1964, D.Sc. 1969 from WUT, the title of Professor awarded 1983.

With WUT since 1957, Vice-Dean of the Faculty of Electronics (1971–1975), Deputy Director (1975–1981) and Director of ICCE (1981–1984). Member of the Senate of Warsaw University of Technology (1981-1984), Chairman of the Senate Committee of Finances (1981-84). Professor of the University in Port Harcourt, Nigeria (1984-1987), Professor of the Institute of Telecommunications since 1997. Member of WUT Committee of Avards, Chairman of FEIT Committee for Ph.D. Degrees in Automatic Control and Computer Sciences, Member of FEIT Committee on Academic Staff Development and Commitee of Education. Head of ICCE Optimization and Decision Support Division since 1997.

Interests: knowledge engineering, expert systems, artificial intelligence.

Project participation: [P21, P22]

**Andrzej P. Wierzbicki**  Professor, Optimization and Decision Support Division.

room 24
tel. 660 7750 825 5280
A.Wierzbicki@ia.pw.edu.pl

M.Sc. 1960, Ph.D. 1964, D.Sc. 1968 from WUT, titles of Professor of Optimization and Decision Theory awarded in 1975 and 1992.

With WUT since 1961, half time since March 1997. Deputy Director of the ICCE (1971–1975), Deputy Dean and then Dean of FEIT(1972–1978) member of the Senate (1975–1978), member or chairman of many university commissions. Since 1978 working with the International Institute for Applied Systems Analysis (IIASA) in Laxenburg, Austria and served (1979–1984) as the chairman of the Systems and Decision Sciences Program. Visiting prof. at the University of Minnesota, Minneapolis, MN, Brown University, Providence, RI (1970–1971), and Kyoto University, Japan (1989–1990). Director of the National Institute of Telecommunications in Poland since 1996. Chairman of the Commission of Applied Research of the State Commitee for Scientific Research (KBN)(1991–1994) Chairman of the Consulting Panel for Promotion and Policy of Science of State Committee for Scientific Research (KBN) (1994–2000), Member of the Consulting Panel for Computer Infrastructure of Science KBN (1994–2000). Chairman of the Scientific Council of the Industrial Institute for Automation and Measurements (PIAP) (since 1991), Scientific and Academic Computer Network (since 1994), and member of the Scientific Council of Institute of System Research (IBS PAN) (since 1992). Member of the Committee of Automation and Robotics of Polish Academy of Sciences (PAN) (since 1970), Chairman of its Section on Decision Support Systems (since 1992), Member of the presidium of the Committee of Future Research "Poland in XXI Century" of PAN (since 1996), Member of the Panel for Cooperation with IIASA of PAN. Member of the presidium of the Polish Association for the Club of Rome (since 1995). Member of Polish Mathematical Society (PTM) (since 1975) and of Society of Polish Electrical Engineers (SEP) (since 1970). Member of the Information Society Technology Advisory Group (ISTAG) of the European Commision (since 2000). Recepient of George Cantor Award of the Int. Soc. of Multi-Criteria Decision Making for his results in multicriteria optimization theory and decision support methodology (1992).

Interests: optimization theory and algorithms, decision theory, decision support systems, negotiation methods and experiences, applications in telecommunication, information society issues.

Publications: [Ch4, Ch5, Ch6, Ch7, Ch8, Ch9, Ch10, Ch11, Ch12, Ch13, B3]

**Adam Woźniak**  Assistant Professor, Control and Systems Division.

room 560
tel. 660 7665
A.Wozniak@ia.pw.edu.pl

M.Sc. 1970, Ph.D. 1975 from WUT.

With WUT since 1970. Advisor to the Dean of Faculty for Departmental Libraries (1987–1993 and 1999 to present), Member of WUT Library Council (since 1999).

Interests: control of complex systems, servomechanisms, robot control, multicriteria optimization, game theory, decision support systems.

Project participation: [P3, P4]

Publications: [LC16, IC14]

Reports: [R18, R21]

**Cezary Zieliński**  M.Sc. 1982, Ph.D. 1988, D.Sc. 1996 from WUT.

With WUT since 1985. Research visitor at Loughborough University of Technology, UK (1990, 1992), Senior Fellow at Nanyang Technological University, Singapore (since 16 July 1999), Secretary of Priority Research Program in Control, Information Technology, and Automation (PATIA) (untill June 1999). Member of the Editorial Board of International Journal of Intelligent Mechatronics: Design and Production. Head of ICCE Robotics Group since 1996.

Interests: robot programming languages, open-structure robot controllers, robot kinematics, digital and microprocessor systems.

Publications: [IC14]

## 2.3 Supporting Faculty and Staff

Here we list Lecturers, Assistants, and Research Associates, as well as Technical Staff.

**Piotr Bolek**  Software Engineer, Control and Systems Division.

room 560
tel. 660 7665
P.Bolek@ia.pw.edu.pl

> M.Sc. 1991 from WUT.
>
> With WUT since 1991.
>
> Interests: operating systems, UNIX, symbolic calculations, computer networks, parallel and distributed computing, game theory, text processing, electronic publications, TeX, perl, SGML, HTML, PDF, databases.
>
> Reports: [R17]

**Marek Brudka**  Assistant, Control and Systems Division.

room 572a
tel. 660 7120
M.Brudka@ia.pw.edu.pl

> M.Sc. 1994 from WUT, Ph.D, 2000 from WUT.
>
> With WUT since 2000.
>
> Interests: neural networks, robot control, real-time operating systems, modeling and identification.
>
> Project participation: [P4]

**Krzysztof Kierzenkowski**  Assistant, Control and Systems Division.

room 561
tel. 660 7123
K.Kierzenkowski@ia.pw.edu.p

> M.Sc. 1992 from WUT.
>
> With WUT since 1993.
>
> Interests: parallel and distributed computation, robot control systems, machine vision, image processing.

**Urszula Kręglewska**  Senior Engineer, Control and Systems Division.

room 562
tel. 660 7756, 7121
U.Kreglewska@ia.pw.edu.pl

> M.Sc. 1973.
>
> With WUT in 1973–1993 and from 1994 to present, with Digital Equipment Poland 1993–1994.
>
> Interests: computer interfaces design.

**Włodzimierz Macewicz**  Software Engineer (senior grade), Control and Systems Division.

room 525
tel. 660 7699
W.Macewicz.@ia.pw.edu.pl

> M.Sc. 1983 from WUT.
>
> With WUT since 1983.
>
> Interests: computer networks, data bases, operating systems, programming languages, text processing.

**Piotr Misiurewicz**  Senior R&D Engineer, Control and Systems Division.

room 566
tel. 660 7649
P.Misiurewicz@ia.pw.edu.pl

> M.Sc. 1961, Ph.D. 1969 from WUT.
>
> With WUT since 1965. Deputy Director of ICCE (1984–1993).
>
> Interests: design of digital systems and microprocessor-based control and measurement systems.

**Jerzy Pułaczewski**  Retired Associate Professor, Senior R&D Engineer, Control and Systems Division.

room 567
tel. 660 7860
J.Pułaczewski@ia.pw.edu.pl

> M.Sc. 1958, Ph.D. 1965 from WUT.
>
> With WUT since 1956, Deputy Director of ICCE (1972–80 and 1993–96), Deputy Dean of the Faculty of Electronics (1981–87), Chairman of the Departmental Curriculum Committee (1981–90), member of the Senate of Warsaw University of Technology (1987–90). Scholarship in Moscow Electroenergy University (1958–59), the British Council scholarship at Cambridge University, UK (1965–66), visiting researcher at Minneapolis University, Minneapolis, MN (1980–81).
>
> Interests: digital control algorithms, process modeling and simulation, process control.
>
> Project participation: [P7]

**Jerzy Sobczyk**  Lecturer, Optimization and Decision Support Division.

room 519
tel. 660 7863
J.Sobczyk@ia.pw.edu.pl

> M.Sc. 1985 from WUT.
>
> With WUT since 1984. FEIT Network Administrator.
>
> Interests: computer networks, programming languages, parallel and distributed programming, multicriteria Optimization.

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M.Warchol@ia.pw.edu.pl

**Michał Warchoł** Assistant (till September 2000) Lecturer(since October 2000), Control and Systems Division.

M.Sc. 1991 from WUT.

With WUT since 1991.

Interests: predictive control, synthesis of control systems, symbolic calculations, operating systems.

Project participation: [P3, P6]

Publications: [IC20]

Reports: [R3]

room 519
tel. 660 7863
G.Wojcik@ia.pw.edu.pl

**Grzegorz Wójcik** Software Engineer, Optimization and Decision Support Division.

M.Sc. 1994 from WUT.

With WUT since 1994, half time since Feb. 1998.

## 2.4 Ph.D. Students

E-mail addresses of Ph.d. students have form: *i.name*@elka.pw.edu.pl where *i* = first name initial, *name* = surname.

| | |
|---|---|
| Piotr Arabas | Project participation: [P1, P3]; Publications: [IC1]; Reports: [R1, R2] |
| Rafał Cegieła | |
| Jarosław Chrobak | Publications: [IC5, IC10]; Reports: [R15] |
| Adam Czajka | Project participation: [P1] |
| Przemysław Jaskóła | Project participation: [P1] |
| Michał Gomuliński | |
| Mariusz Kaleta | Project participation: [P20]; Publications: [LC1, LC2, LC7]; Reports: [R4] |
| Mariusz Kamola | Project participation: [P1]; Publications: [IC9, LC3] |
| Remigiusz Krupa | Project participation: [P2] |
| Tomasz Kozak | |
| Sylwester Laskowski | |
| Rafał Lewczuk | |
| Maciej Ławryńczuk | Project participation: [P7, P8, P15]; Publications: [LC4, IC12]; Reports: [R7, R8] |
| Andrzej Machnacz | |
| Przemysław Magiera | Reports: [R5] |
| Marek Małowicki | |
| Michał Malarski | |
| Piotr Marusak | Project participation: [P7, P8, P15]; Publications: [IC13, LC5]; Reports: [R8, R9] |
| Izabela Mileńko | Project participation: [P20]; Publications: [LC6, LC5]; Reports: [R4] |
| Jarosław Protasiewicz | |
| Sebastian Plamowski | Project participation: [P8]; Publications: [LC7] |
| Dariusz Radomski | Reports: [R15] |
| Adam Szmigielski | |
| Mirosław Szpilewski | |
| Krzysztof Synowiec | |
| Tomasz Śliwiński | Reports: [R19] |
| Wojciech Tadej | Project participation: [P15] |
| Artur Walczak | Project participation: [P2]; Publications: [LC1, LC2, LC7, LC14]; Reports: [A7] |
| Gebre Wolde Mariam | |
| Karol Zadora-Przyłęcki | Publications:[LC6, LC11, LC12] |
| Andrzej Zalewski | |
| Maciej Żmuda | Project participation: [P3, P6] |

## 2.5 Administrative and support staff

Jolanta Cieślewicz          Librarian and Office Support.
Elżbieta Głowacka          Secretary, Student Affairs.
Maria Graszka              Office support.
Elżbieta Matyjasiak        Secretary, Main Office.
Bogdan Murzynowski         Technical Support
Jolanta Niedbało           Office support (half-time).
Irena Olszewska            Specialist, Finances. M.Sc. 1979 from Warsaw University.
Jadwiga Osowska            Manager, Finances. M.Sc. 1975 from WUT.
Ryszard Tchórz             Technical support.
Daniel Wieczorek           Technical support (half-time).
Andrzej Wiśniewski         Technical support.
Beata Woźniak              Manager, Administration. M.Sc. 1993 from Warsaw University.

# 3 Teaching Activities 1999/2000

| Course Title | Course code | Hours per week* | Lecturer | Semester |
|---|---|---|---|---|
| Administration of UNIX and TCP/IP | ASU | 2 – 2 – | J. Sobczyk | 6 SIWD |
| Data Bases and Information Systems | BSSI | 2 – 2 – | T. Traczyk | 5 SIWD |
| Computer Networks** | ECONE | 2 – 2 – | J. Sobczyk (summer) | |
| Control** | ECONT | 2 – 2 – | R. Ładziński (summer) | sem. 6 |
| Digital Control Algorithms | CAR | 2 – – 1 | J. Pułaczewski (winter) | |
| Dynamic Systems** | EDYSY | 2 – 2 – | R. Ładziński (winter) | sem. 5 |
| Elements of Robotics | ERO | 2 – 2 – | W. Szynkiewicz | 7 KSS |
| Discrete Process Scheduling | HPD | 2 – 2 – | E. Toczyłowski | 6 SIWD |
| Knowledge Engineering | IW | 2 – – 1 | W. Traczyk | 7 SIWD |
| Commercial Data Bases 2 | KBD2 | 2 – – 2 | T. Traczyk (summer) | |
| Numerical Methods and Simulation | MNSK | 2 – 2 – | P. Tatjewski | 5 KSS, SIWD |
| Methods of Global Optimization | MOG | 2 – – 2 | E. Niewiadomska -Szynkiewicz (winter) | |
| Evolutionary strategies | MSR | 2 – 2 – | P. Domański (summer) | |
| Artificial Inteligence Methods | MSI | 2 – – 1 | W. Traczyk (summer) | |
| Models and Statistical Inference | MWS | 2 – – 1 | A. Pacut | 7 SIWD |
| Modeling and Forecasting | MPRO | 3 – – 1 | A. Pacut | 6 KSS |
| Numerical Methods** | ENUME | 2 – 2 – | P. Tatjewski (summer) | |
| Operating Systems** | EOPSY | 2 1 1 – | A. Bogobowicz | |
| Optimization and Decision Support | OWD | 2 – – 1 | A. Wierzbicki (summer) | |
| Optimization in Operation Research | OBO | 2 – – 1 | E. Toczyłowski (winter) | |
| Fundamentals of Operation Research | POBO | 2 – 1 – | K. Pieńkosz (summer), G. Płoszajski (winter) | sem. 4 |
| Fundamentals of Parallel and Distributed Computation | PORR | 2 – – 2 | A. Karbowski | |
| Fundamentals of Optimization | POPTY | 2 – 2 – | A. Stachurski | 5 SIWD |
| Controls Fundamentals | PRE | 2 – 1 – | K. Nowosad (winter), A. Woźniak (summer) | |
| Fundamentals of Control Systems | PSS | 2 1 1 – | P. Tatjewski (summer), K. Malinowski (winter) | sem. 4 |
| Programming 1** | EPRO1 | 2 1 1 – | J. Paczyński (winter) | |
| Programming 2** | EPRO2 | 2 – 2 – | A. Stachurski (summer) | |

| Course Title | Course code | Hours per week* | Lecturer | Semester |
|---|---|---|---|---|
| Object Oriented Programming | PROO | 2 – 2 – | W. Kasprzak | P2 sem. 3 |
| C Programming | PROC | 2 – 2 – | A. Stachurski | P2 sem. 2 |
| Control Design | PURE | 2 – – 2 | A. Woźniak | 5 KSS |
| Distributed Operating Systems | RSO | 2 – 1 – | T.J. Kruk (summer) | |
| Digital Servomechanisms | SCYF | 2 – – 1 | S. Romicki (winter) | |
| Computer Networks | SKP2 | 2 – 1 – | T. Rogowski (winter), J. Sobczyk (summer) | 5 KSS, SIWD |
| Neural Networks | SNUP | 2 – – 1 | A. Pacut (summer) | |
| Software Specification and Design | SPOP | 2 – 1 – | K. Sacha | 7 SIWD |
| Programmable Controllers | SP | 2 – 2 – | J. Gustowski | 6 KSS |
| System Simulation and Control | SSS | 2 – – 1 | K. Malinowski (summer) | |
| Real-time Systems | SCZR | 2 – 2 – | K. Sacha | 6 KSS |
| Operating Systems | SOP2A | 2 – 2 – | A. Bogobowicz | 5 KSS, SIWD |
| Process Automatization Techniques | TAP | 2 – 1 – | P. Tatjewski (winter) | |
| Microprocessor Techniques | TM | 2 1 2 – | A. Rydzewski | 5 KSS |
| Theory of Optimization | TOP | 2 – – 1 | A. Wierzbicki (winter) | |
| Control Theory | TST | 2 1 – 1 | A. Woźniak (summer) | |
| Logic Circuits | UKLO | 2 – 2 – | A. Rydzewski | P1 sem. 3 |
| Decision Support in Situation of Risk | WDWR | 2 – – 1 | W. Ogryczak (summer) | |
| Decision Support and Design | WDIP | 2 – 2 – | J. Granat | 6 SIWD |
| Synthesis of Decision Rules | ZSRD | 2 – 2 – | K. Malinowski | 6 SIWD |
| Information Project Management | ZPI | 2 – – 1 | K. Pieńkosz | 8 SIWD |

\* – Digits mean hours per week of lecture, class, laboratory and project, resp. (for instance, [2 – 1 1] means two hours of lecture, lack of class, one hour of laboratory and one hour of project).
\*\* – Courses taught in English.

# 4   Projects

[P1] The IST Programme IST-1999-2003: **QOSIPS Quality of service and pricing differentiation for IP services**, granting period 01.09.2000-30.06.2002. Coordinator: University of Manchester, Institute of Science and Technology (UMIST), UK. Subcontractor: ICCE, Knowledge Support Systems Ltd. (KSS) (Manchester, UK), Ipanema Technologies (Paris, France), 9 Telecom Reseau (Paris, France). Project managers: Krzysztof Malinowski, Ewa Niewiadomska-Szynkiewicz. Investigators: Piotr Arabas, Adam Czajka, Przemysław Jaskóła, Mariusz Kamola.

The objectives of the QOSIPS project is to develop innovative technologies for supporting Quality of Service management, service differentiation and price setting of Internet Protocol Network Service Providers.

[P2] KBN grant PB 788/T11/97/13: **Robust methods for management and control of manufacturing systems in the case of disturbances**, 01.09.1997–30.06.2000. Coordinator: ICCE. Principal investigator: Krzysztof Pieńkosz. Investigators: Remigiusz Krupa, Krzysztof Maik, Tomasz Sikorski, Eugeniusz Toczyłowski, Artur Walczak.

The aim of the project was to develop planning and scheduling methods for manufacturing systems in the case when some disturbances occur due to uncertain demands, machine tools breakdowns, absence of employees, etc. Both predictive and reactive scheduling algorithms were investigated which allow to reduce the effects of disturbances. A multi-agent approach is also analyzed, where the manufacturing system is modeled as a distributed system with relatively independent units.

[P3] KBN grant 8T11A01115: **Control structures and algorithms for complex systems, computational methods and applications**, granting period 01.09.1998–31.08.2000. Co-ordinator: ICCE. Principal investigator: Ewa Niewiadomska-Szynkiewicz. Investigators: Piotr Arabas, Andrzej Karbowski, Krzysztof Malinowski, Krzysztof Nowosad, Mariusz Siomak, Michał Warchoł, Adam Woźniak, Maciej Żmuda.

The goal of the project was to develop and implement control structures and algorithms for large scale systems. The focus was to apply the proposed control methods (hierarchical structures, predictive control algorithms, fuzzy sets, dynamic programming, neurodynamic programming) to selected real-life complex problems and test their effectiveness through simulation experiments. The considered case studies include: air defence, control of oil department in petrochemical works, flood control in multireservoir systems, optimal portfolio selection.

[P4] CATID grant: **Perception and control of robotic and adaptive systems**, granting period 01.10.1999–31.05.2000. Coordinator: ICCE. Participation: Institute of Aeronautics and Applied Mechanics (ITLIMS), Institute of Automatic Control and Robotic (IAR), Institute of Manufacturing Technology (ITM). Principal investigator: Wojciech Szynkiewicz. Investigators: Andrzej Pacut, Dariusz Radomski, Andrzej Rydzewski, Adam Woźniak.

The project consisted of the following tasks: improvement and investigation of a laboratory stand containing the RNT robot equipped with a coupler enabling quick changeover of tools for various tasks, improvement and investigations of a new very fast prototype robot POLYCRANK with DD motors, improvement of the POLYCRANK and RNT robot control systems (electronic module for measuring forces, new servo algorithms for POLYCRANK robot, new robot motion trajectory generators), motion planning methods for multi-robot systems, adaptive systems (adaptive detection methods in digital image sequence analysis, inverse model adaptive control of the infusion pump), application of neural networks to induction motor drive approximation.

[P5] CATID grant: **Design and control of mobile robots and manipulators**, granting period 01.10.2000–31.05.2001. Coordinator: CATID. Participation: Institute of Aeronautics and Applied Mechanics (ITLIMS), Institute of Control and Computation Engineering (ICCE). Principal investigator: Wojciech Szynkiewicz. Investigators: Marek Brudka, Włodzimierz Kasprzak, Andrzej Rydzewski, Adam Woźniak.

The project consisted of the following tasks: Further development and investigation of a prototype robot POLYCRANK driven by DD motors with 6 d.o.f., advanced control systems for mobile robots and manipulators, design of the modular surveillance mobile robot, localization and navigation in unknown or partially unknown environment, digital image analysis for unmanned vehicle control. The project is divided into two main areas: mechanical design of a new mobile and articulates robot and development of the sensor-based control systems for those robots.

[P6] CATID grant: **Optimization and parallel computation in complex systems - methods and application**, granting period 01.10.1999–31.05.2000. Coordinator: ICCE. Principal investigator: Ewa Niewiadomska-Szynkiewicz. Investigators: Andrzej Karbowski, Michał Warchoł, Maciej Żmuda.

The basic goal of the project was to develop library of global optimization methods, comparative study of optimization techniques, implementation of these algorithms in case studies ranging from water resources management, through electronic circuit design, to mechanics Particular attention was given to parallel and distributed computations.

[P7] CATID grant: **Algorithms and software for advanced control and diagnostics of industrial processes**, granting period 01.10.1999–31.05.2000. Coordinator: Institute of Automatic Control and Robotic (IAR). Subcontractor: ICCE. Principal investigators: Piotr Tatjewski, Jan M. Kościelny. Investigators: Piotr Marusak, Krzysztof Nowosad, Jerzy Pułaczewski, Maciej Ławryńczuk.

The goal of the project was a further development of algorithms and software modules for upper-layer (supervisory) control of industrial processes, i.e., advanced control (multistep predictive control with constraints, nonlinear predictive control), set-point optimization, identification and diagnostics. The first version of the software system REGZA for advanced control has been completed. Control system for a new pilot production line in

the Laboratory of Technological Processes (Faculty of Chemistry) have been preliminary designed and control equipment for the installation completed. The installation is planned to be used in the future as a process for testing new control algorithms, and for training purposes. The tasks were performed by a team of researchers and PhD students from four collaborating institutes from different faculties of Warsaw University of Technology.

[P8] CATID grant: **Software development for modeling and advanced control of industrial processes - package REGZA, ver. II**, granting period 01.10.2000–31.05.2001. Principal investigator: Piotr Tatjewski. Investigators: Piotr Marusak, Maciej Ławryńczuk, Sebastian Plamowski.

The aim of the project is to further develop the software package "REGZA", by adding missing blocks and functions and improving the existing first version (annuled in the previous year).

[P9] Rector's grant: **Preparation of a standard for effective resolution measurements in analog-didital systems for use by IEEE and EUPAS**, granting period 01.06.1999–31.05.2000. Coordinator: ICCE. Investigator: Andrzej Pacut.

The goal of the project was to develop the theory aimed into a modification of IEEE and EUPAS norms in the area of diagnostics of analog-to-digital converters. The main goal is to overcome a low repeatability of the effective resolution measurement caused by the estimation of quantization error parameters.

[P10] Rector's grant 503G/0080/009: **Adaptive method of image classification**, granting period 01.07.1999–31.05.2000. Coordinator: ICCE. Principal investigator: Włodzimierz Kasprzak.

In this research work an adaptive (ANN-learning based) approach to the classification of well-defined digital image windows is developed. The applied classification method is based entirely on image space transformation. Two adaptive methods - learning algorithms in artificial neural networks (ANN) - are developed, which solve the compression and classification tasks: A. principal component analysis (PCA) or principal subspace analysis (PSA) based compression of the vector signal; B. a supervised learning vector quantifier (LVQ) method, which performs a discriminant analysis (DA) in the reduced space, i.e. the class border detection in this space.

[P11] Rector's grant 503G/0070/009: **Entropy production in nonlinear hyperbolic systems**, granting period 01.07.1999–31.05.2000. Coordinator: ICCE. Principal investigator: Agnieszka Bogobowicz.

An approximation of singularities in the phase space of hyperbolic systems was constructed. Such approximation enables for a process recognition in open systems. The assumption of research is that not all conceivable interactions in equations must be taken into consideration. The simulating system generates some emerging properties.

[P12] Rector's grant 503G/0010/200: **Data structures for nonlinear hyperbolic systems**, granting period 01.06.2000–30.11.2000. Coordinator: ICCE. Principal investigator: Agnieszka Bogobowicz.

New form of Hamiltonian is derived for unified methodology solving highly non-linear distributed parameter systems. Data structure in a form of hypertext is built.

[P13] Rector's grant 503G/0090/009: **Internet viewier for Profibus network**, granting period 27.05.1999–31.05.2000. Coordinator: ICCE. Principal investigator: Krzysztof Sacha.

Fieldbus systems influence greatly the overall dependability of modern computer control systems. The architecture of fieldbus differ significantly from the architecture of popular LANs. One of the most broadly used fieldbus system in Profibus, which was standardized in 1991. The goal of this project was to develop an internet viewer for Profibus systems.

[P14] Rector's grant 503G/0020/200: **Motion planning methods for multi-robot systems**, granting period 01.09.2000–31.05.2001. Principal investigator: Wojciech Szynkiewicz.

The main objective of the project is to develop a basic methodology of motion planning algorithms for multiple cooperating robots working in unknown or dynamic environment. Cooperation is a vital part of applying multiple robots (especially group of mobile robots) to a single task in an efficient manner. Different types of cooperation between robots are considered from independent robots to tightly coordinated robot teams.

[P15] Dean's grant 503G/0180/200: **Supervisory optimizing control algorithms**, granting period 01.09.2000–31.05.2001. Principal investigator: Piotr Tatjewski. Investigators: Piotr Marusak, Maciej Ławryńczuk, Wojciech Tadej.

The project is devoted to supervisory control algorithms where optimization plays an important role. First, design of model-based predictive control algorithm of DMC (Dynamic Matrix Control) type under uncertainty will be investigated. Second, procedures for model-based predictive algorithms for non-linear systems using neural-net modelling will be derived. Third, theoretical analysis of the dual-type ISOPE (Integrated System Optimization and Parameter Estimation) method for steady-state optimizing control will be carried out, with first results published.

[P16] Dean's grant 503G/0150/009: **Identification of quantizer's input signal parameters - for use in IEEE and EUPAS standards**, granting period 01.07.1999–31.05.2000. Coordinator: ICCE. Participation: Institute of Electronic Systems (ISE). Principal investigator: Andrzej Pacut.

The goal of the project was to develop a new method of estimation of input (analog) signals based on the measurements of quantizer output signals. The method is based on a novel analysis of the quantizer error parameters. The results are directed into a modification of the IEEE and EUPAS standards in the area of the diagnostics of analog-to-digital converters.

[P17] Dean's grant 503G/0140/009: **Computer aided control systems analysis and synthesis**, granting period 01.07.1999–31.05.2000. Coordinator: ICCE. Principal investigator: Ewa Niewiadomska-Szynkiewicz.

The goal of the project was to develop the methodology for computer aided analysis and synthesis of complex systems control. The work was focused on hierarchical and global optimization, multilevel control structures and predictive control. Particular attention was given to distributed and parallel computer simulation.

[P18] Dean's grant 503G/0190/200: **Analysis of possible application of XML and XSL languages in infornation systems with databases**, granting period 01.07.2000–31.05.2001. Principal investigator: Tomasz Traczyk.

Analysis of possible use of XML language and related languages (XSL, etc.) for information system analysis and design, information storage and processing in databases. Research on existing XML-related technologies in database management systems.

[P19] Dean's grant 503/G/0170/200: **Integration of control algorithms based upon the model of the object with soft-computing methods**, granting period: 01.10.2000 - 31.05.2001. Principal investigator: Jerzy Gustowski.

The main goal of the project is a trial to prepare a soft-computing control algorithm combining the analytical knowledge of the object (model) with the data derived from experiments.

[P20] Dean's grant 503/G/0160/009: **Development of models and algorithms for decision support systems in the presence of risk. Application in commodity markets and, in particular, in the electric energy market**, granting period: 01.02.2000 - 31.05.2001. Principal investigator: Eugeniusz Toczyłowski. Investigators: Włodzimierz Ogryczak, Mariusz Kaleta, Izabela Żółtowska, Mariusz Tomczyk.

In this research new nonstandard optimisation models and methods for decision support in the presence of risk are developed. The models are based on using nonstandard asymetric and threshold risk measures. The methods are applied to the decision support system on the electric energy market.

[P21] Statutory grant 504G/036/9: **Development of methodology of control, decision support and production management**, granting period 01.06.1999–15.04.2000. Coordinator: ICCE. Principal investigator: Andrzej Pacut. Investigators: Krzysztof Malinowski, Wojciech Szynkiewicz, Piotr Tatjewski, Eugeniusz Toczyłowski, Wiesław Traczyk.

[P22] Statutory grant 504G/036/9: **Development of methodology of control, decision support and production management**, granting period 01.06.2000–15.04.2001. Coordinator: ICCE. Principal investigator: Andrzej Pacut. Investigators: Krzysztof Malinowski, Wojciech Szynkiewicz, Piotr Tatjewski, Eugeniusz Toczyłowski, Wiesław Traczyk.

[P23] Grant WZ/171/030/98: **Cooperation with Department of Electrical & Computer Engineering at Oregon State University in Covallis, Oregon, USA**, granting period 01.07.1999–31.05.2001. Coordinator: ICCE. Principal investigator: Andrzej Pacut.

Research in the area of feedback control with the use of classical and neural techniques.

[P24] Grant WZ/159/030/98: **Cooperation with Institute of Natural and Environmental Sciences of Lancaster University, United Kingdom**, granting period 01.07.1999–31.05.2001. Coordinator: ICCE. Principal investigator: Andrzej Pacut.

Research in the area of adaptive control in living organisms.

[P25] Grant WZ179/030/98: **Cooperation with Institute for Robotics and Computer Control of Technical University of Braunschweig**, granting period 01.07.1999–31.05.2001. Coordinator: ICCE. Principal investigator: Wojciech Szynkiewicz. Investigators: Włodzimierz Kasprzak.

The robotics teams from the Institute of Control and Computing Engineering and the Institute for Robotics and Computer Control of Technical University of Braunschweig deal with structures and architectures of new robot controllers and the methods of their programming. Truly intelligent robotics systems, dealing appropriately with unexpected behavior of the environment, can be obtained only, if the system is equipped with sensors of different types and is capable of processing high volumes of information from them and executing efficient data fusion from diverse sources. The experience of both teams in dealing with above-mentioned problems fruitfully exchanged. The best forum for the discussion of problems of common interest are lectures for Ph.D. students and seminar presentations followed by discussions. This can lead to a future joint research and publications.

# 5 Degrees Awarded

## 5.1 D.Sc. Degrees

●Andrzej Pacut, *Stochastic Modeling at Diverse Scales: From Poisson to Network Neurons*. October 17, 2000

## 5.2 Ph.D. Degrees

●Cezary Głowiński, *Poszukiwanie asocjacji i ich wykorzystanie do formułowania zależności w bazach danych*. Advisor: Wiesław Traczyk, January 25, 2000
●Tomasz Ładziński, *Symulacja i prototypy systemu konstruktora zdarzeń detektora cząstek elementarnych*. Advisor: Krzysztof Malinowski, January 25, 2000
●Mariusz Siomak, *Synteza optymalnych reguł decyzyjnych w warunkach niepewności: cele, modele, metody*. Advisor: Krzysztof Malinowski, November 28, 2000
●Krzysztof Maik, *Wybrane modele i algorytmy nadrzędnego planowania produkcji porcjami*. Advisor: Eugeniusz Toczyłowski, November 28, 2000
●Marek Brudka, *Sieci neuronowe w sterowaniu robotem na podstawie obrazów ultradźwiękowych*. Advisor: Krzysztof Malinowski, November 28, 2000

## 5.3 M.Sc. Degrees

M.Sc. degrees awarded in the period 1997–2000

### Advisor: Agnieszka Bogobowicz

●Ali Mhammed Benniran: *The effect of interconnectivity on the stability of Hopfield Network* – 06.2000

### Advisor: Paweł Domański

●S. Plamowski: *Wykorzystanie algorytmów genetycznych w modelowaniu* – 10.2000
●R. Sikora: *Sterowanie i symulacja makiety kolejowej* – 04.2000
●D. Misiurek: *Modelowanie i regulacja emisji dwutlenku siarki dla kotła fluidalnego* – 10.1997
●M. Kucharski: *Jakościowe metody modelowania i regulacji procesu emisji dwutlenku siarki* – 10.1997

•A. Włoszek: *Podejście koewolucyjne do modelowania jakościowego* – 10.1997

•M. Szpilewski: *Realizacja i analiza struktur układu regulacji z logiką rozmytą dla stanowiska laboratoryjnego zbiornika przepływowego* – 10.1997

### Advisor: Andrzej Grodecki

•H. Naumczyk: *Analiza porównawcza metod projektowania dyskretnych regulatorów napędów ramion robota. Podejście częstotliwościowe i metoda linii pierwiastkowych* – 04.1997

### Advisor: Janusz Granat

•P. Kędzierski: *Modelowanie matematyczne a organizacja przedsiębiorstwa* – 10.1999

•J. Pietrzykowski: *Metoda punktu odniesienia w analizie danych* – 10.1999

### Advisor: Jerzy Gustowski

•R. Kalinowski: *System pomiarowy z kartą wizyjną* – 10.2000

•G. Zarzycki: *System programowania i wizualizacji pracy sterowników Allen-Bradley* – 07.1999

•B. Lewandowski, P. Stępień: *Sterowanie odwrotnego wahadła napędzanego silnikiem o ruchu liniowym przy użyciu komputera przemysłowego* – 07.1998

•M. Ptasiński: *System uruchamiania i zabezpieczeń pieców instalacji utylizacji siarkowodoru Claus 7 i 8 z wykorzystaniem sterownika FSC Honeywel* – 10.1997

•P. Kwapień: *Wizyjne rozszerzenie laboratoryjnego stanowiska sterowania binarnego* – 10.1997

•A. Wróblewski: *Sterownik manipulatora laboratoryjnego* – 04.1997

### Advisor: Włodzimierz Macewicz

•M. Szarpak: *Ograniczenie dostępu do zasobów Internetu* – 10.2000

### Advisor: Krzysztof Malinowski

•A. Kozak: *Wybrane aspekty algorytmów wspomagania inwestycji na rynku obligacji skarbowych* – 10.2000

•P. Jaskóła: *Optymalizacja procesu komponowania benzyn silnikowych* – 06.1999

•M. Gomuliński: *Rozdział jednakowych zadań w rozproszonym środowisku obliczeniowym* – 03.1999 (with distinction)

•G. Fus: *Implementacja zdalnego dostępu do zasobów serwera NetWare za pomocą Internetowego protokołu FTP* – 03.1998

•M. Kamola: *Sterowanie z powtarzaną optymalizacją. Optymalizacja z nierównomierną dyskretyzacją sterowania* – 06.1997 (with distinction)

### Advisor: Ewa Niewiadomska-Szynkiewicz

•M. Włodarczyk: *Metody hierarchiczne w zadaniach optymalizacji inwestycji* – 07.2000

•T. Pyrka, T. Chmielnicki: *Środowisko oprogramowania do symulacji sterowania systemem wielozbiornikowym podczas powodzi* – 06.2000

•A. Pondarzewski: *Interfejs graficzny heterogenicznego środowiska do symulacji asynchronicznej* – 10.1999

•P. Cabak: *Biblioteka klas służąca do budowania graficznego interfejsu użytkownika w jednostkach obliczeniowych systemu CSAS&S-ANV* - 10.1999

•R. Śliwiński: *Środowiska graficzne do badania algorytmów optymalizacji* – 01.1999

•D. Chilewicz: *Pakiet oprogramowania do wspomagania decyzji w zakresie bilansów wodno-gospodarczych* – 06.1998

•M. Żmuda: *Środowisko oprogramowania do asynchronicznej symulacji* - 01.1997 (with distinction)

### Advisor: Krzysztof Nowosad

•G. Kulawiak: *System sterowania sekwencyjnego GRAPH5* – 01.1999

•M. Maślany, P. Górnicki: *Automatyzacja sterowania napędem anteny stacji radiolokacyjnej* – 10.1997

•T. Pastuszak: *Karta przetwornika wizyjnego do komputera IBM PC* – 06.1997

### Advisor: Andrzej Karbowski

●J. Błaszczyk: *Obiektowa biblioteka do rozwiązywania zadań sterowania optymalnego z czasem dyskretnym* - 12.2000
●T. Chądzyński: *FP-SOZ-2000: uniwersalny system wspomagania decyzji operatora zbiornika retencyjnego w czasie powodzi* – 03.2000
●R. Kobyliński: *Środowisko WDM do tworzenia aplikacji równoległych i rozproszonych na platformie MS Windows* – 11.1999
●J. Chrobak: *Porównanie algorytmów neuronowych i tradycyjnych w zastosowaniu do rozwiązywania zadań syntezy optymalnej bez znanego modelu obiektu sterowania* – 03.1999 (with distinction)
●P. Magiera: *Optymalizacja reguł decyzyjnych w zadaniach z parą kryteriów oceny typu wartość oczekiwana-wariancja* – 10.1998 (with distinction)

### Advisor: Włodzimierz Kasprzak

●W. Lis: *Komputerowy system detekcji wybranych obiektów kartograficznych w obrazach cyfrowych* – 10.1999

### Advisor: Zygmunt Komor

●Le Thanh Hai: *Wykorzystanie arkusza kalkulacyjnego do sprzęgania małych autonomicznych systemów pomiarowych i sterujących. (Na przykładzie implementacji w ICHP).* – 03.1998

### Advisor: Tomasz Kruk

●R. Lewczuk: *Modularyzacja jądra systemu AMOEBA* – 10.2000

### Advisor: Konstanty Kurman

●D.M. Pakulski: *Projekt dwuwymiarowego układu regulacji dla obiektu absopcyjno-desorpcyjnego, odsprzęganie i jego możliwości* – 03.1998

### Advisor: Maciej Kwiatkowski

●G. Koszewski: *Planowanie reklamy w mediach z wykorzystaniem metod komputerowych* – 04.1997

### Advisor: Andrzej Pacut

●S. Soszyński: *Algorytm sterowania neuronowego nieliniowymi obiektami dynamicznymi* – 10.2000
●A. Czajka: *Recognition of Human Signatures Dynamics* – 09.2000 (with distinction)
●D. Kuźma: *Sterownik behawioralny* – 03.2000
●A. Szmigielski: *Modele niepewności w podejmowaniu decyzji* – 02.1998

### Advisor: Jerzy Paczyński

●A. Bober: *Zastosowanie parserów generowanych przy pomocy pakietu ANTLR w trójwarstwowych aplikacjach biznesowych* – 03.2000
●A. Nowakowski: *Transformacje tekstów programów w wybranych językach modelowania* – 03.1999
●B. Rędziński: *Rozszerzenie zastosowań pakietu SAGE++* – 03.1998

### Advisor: Krzysztof Pieńkosz

●K. Chmiel: *Algorytmy ewolucyjne w zastosowaniu do rozwiązywania wybranych problemów kombinatorycznych* – 11.2000
●K. Bednarczyk: *Wybrane metody optymalizacji rozkroju materiałów* – 10.2000
●W. Barański: *Środowisko sterowania wieloagentowego w warunkach zakłóceń w elastycznych systemach montażowych* – 10.1999 (with distinction)
●P. Maślanka: *Wybrane algorytmy grafowe do modelowania procesów dyskretnych* – 10.1998
●J. Jarzębowski: *System sterowania laboratoryjnym gniazdem produkcyjnym* – 10.1997
●A. Mierzyńska: *Wykorzystanie narzędzia Microsoft Office do zarządzania przedsiębiorstwem* – 10.1997
●S. Mateuszczyk: *System do modelowania grafowego wybranych procesów dyskretnych* – 03.1997

### Advisor: Grzegorz Płoszajski

●M. Żebrowski: *Wykorzystanie XML w zarządzaniu dokumentami w aspekcie dydaktyki badań operacyjnych* – 11.2000

●T. Twardowski: *Wspomaganie dydaktyki badań operacyjnych przy użyciu systemu SAS w wybranych zagadnieniach programowania sieciowego i całkowitoliczbowego* – 11.2000

●K. Synowiec: *Bezpieczeństwo aplikacji baz danych w heterogenicznych środowiskach rozproszonych* – 10.2000

●L. Matusiewicz: *Projekt struktury informacji o wydawnictwach ciągłych w bazach danych dla bibliotek uczelnianych* – 03.2000

●M. Sasinowska-Zielińska: *Rozpoznawanie elementów strukturalnych artykułów naukowych w oparciu o narzędzia OCR, w zastosowaniu do tworzenia baz danych* – 10.1999

●A. Kowalczyk: *Porównywanie opisów bibliograficznych w oparciu o algorytmy tekstowe odporne na błędy* – 10.1999

●M. Bąbski: *Koncepcja bazy danych w sieci Internet z rozproszonym wprowadzaniem i centralną weryfikacją danych na przykładzie bazy zapowiedzi konferencji* – 10.1998

●M. Sołkiewicz: *Baza danych dla małych bibliotek uczelnianych jako element ogólnouczelnianego systemu informacyjnego* – 11.1997

●A. Jaros: *Baza danych dla małych bibliotek uczelnianych jako element ogólnouczelnianego systemu informacyjnego* – 10.1997

### Advisor: Jerzy Pułaczewski

●K. Sawicka: *Regulacja wielowymiarowa nieliniowej kolumny destylacyjnej* – 04.2000

●M. Chleikh: *Regulacja optymalizacyjna kolumny destylacyjnej* – 10.1999

●R. Charzewski: *Nieizotermiczny, przepływowy reaktor chemiczny: sterowanie i optymalizacja* – 03.1999

●I. Grzela: *Symulacja, sterowanie i optymalizacja produkcji roślinnej w szklarni* – 10.1998

●A. Gottfired: *Symulacja, sterowanie i optymalizacja nieizotermicznego reaktora chemicznego* – 10.1998

●D. Olkowski: *Lingwistyczna regulacja silnie nieliniowych obiektów przy pomocy sprzężenia od stanu* – 07.1998

●M.L. Ławryńczuk: *Optymalizacja i sterowanie kolumny rektyfikacyjnej* – 03.1998

●P. Kałuski: *Synteza algorytmów lingwistycznych na podstawie danych numerycznych* – 10.1997

●P. Marusak: *Sterowanie silnie nieliniowego obiektu elektromechanicznego* – 09.1997 (with distinction)

### Advisor: Tadeusz Rogowski

●B. Motoszko, R. Szombara: *Nowoczesne techniki multimedialne w sieciach komputerowych* – 10.1999

●S. Pacut: *System ochrony sieci komputerowej na Politechnice Warszawskiej wraz z koncepcją taryfikacji ruchu* – 10.1998 (with distinction)

### Advisor: Stefan Romicki

●A. Jakubowski: *Przyrząd do zdejmowania charakterystyk częstotliwościowych* – 10.2000

●T. Łabędzki: *Serwomechanizm cyfrowy* – 10.1998

●T. Kącki: *Sterownik napędu dysków elastycznych* – 02.1997

### Advisor: Andrzej Rydzewski

●M. Pabich: *Analizator transmitancji obiektów dynamicznych* – 04.2000

●W. Stępniak: *Emulator/Symulator programowo-sprzętowy mikrokomputerów firmy Microchip Technology INC z serii PIC 16C5x* – 05.1999

●W. Sarna: *Mikroprocesorowy rejestrator sygnałów i sterownik dysku* – 11.1998 (with distinction)

●M. Stanisz: *Projekt i wykonanie programatora grubości rękawa do wytłaczarko-rozdmuchiwarki* – 10.1998

●A. Bieliński: *Sterownik sygnalizacji świetlnej SU5* – 03.1998

●K. Kukliński: *System bezprzewodowej identyfikacji uprawnień dostępu z wykorzystaniem transpondera* – 03.1998

●T. Szot: *Oprogramowanie komputerowego systemu sterowania miejską oczyszczalnią ścieków w Chełmie* – 10.1997

### Advisor: Krzysztof Sacha

●J. Mrozek: *Projekt i implementacja protokołu komunikacyjnego 7 warstwy modelu OSI przemysłowej sieci PROFIBUS* – 03.1999
●J. Marczewski: *Integracja środowiska systemu Transnet* – 04.1998
●N. Ciosek: *Edytor graficzny i transformator struktury rozszerzonych sieci Petriego* – 10.1997

### Advisor: Franciszek Seredyński

●M. Jażdżyk: *Odkrywanie z użyciem algorytmu genetycznego reguł automatu komórkowego dla problemu szeregowania zadań w systemach wieloprocesorowych* – 10.2000
●L. Smolik: *Szeregowanie zadań programowania równoległego w systemie dwuprocesorowym z użyciem automatów komórkowych* – 10.2000

### Advisor: Tomasz Sikorski

●P. Surma: *Środowisko do symulacji rynku energii elektrycznej* – 10.2000

### Advisor: Jerzy Sobczyk

●K. Kozioł: *Elektroniczna portmonetka jako nośnik wirtualnych pieniędzy w XXI wieku* – 11.2000
●W. Pietroń: *Kolokwium sieciowe jako element oprogramowania nowoczesnej pracowni dydaktycznej* – 10.1999

### Advisor: Andrzej Stachurski

●D. Skierniewski: *środowisko do wizualizacji pojęć optymalizacji i działania metod optymalizacyjnych* – 09.2000
●A. Senecki: *Organizacja wirtualna: baza danych i interfejs mikropłatności* – 03.2000
●P. Mączyński: *Organizacje wirtualne: model komunikacji* – 03.2000
●M. Wilczak: *Biblioteka obiektowa gradientowych metod optymalizacji dla zadań minimalizacji bez ograniczeń* – 03.2000

### Advisor: Jacek Szymanowski

●A. Pogorzelski: *Zarządzanie pamięcią wirtualną w systemie Minix 2.0* – 03.2000
●M. Malarski: *Komunikacja rozproszonego systemu operacyjnego "Amoeba" w sieciach rozległych* – 10.1999
●R. Wysocki: *Wielowątkowość i zarządzanie procesami w systemie operacyjnym AMOEBA* – 10.1998
●O. Wolski: *Mechanizmy komunikacji międzyprocesorowej w rozproszonym systemie operacyjnym Amoeba* – 06.1998
●K. Baracz: *Analiza rozproszonego systemu plików w systemie Amoeba* – 03.1998.

### Advisor: Wojciech Szynkiewicz

●M. Izdebski: *Generowanie trajektorii ruchu robota w czasie rzeczywistym* – 10.1999
●M. Wełpa: *Graficzny interfejs użytkownika dla sterownika wielorobotowego* – 10.1999

### Advisor: M. Średniawa (Institute of Telecommunications)

●B. Eljasińska: *Implementacja prototypu usług katalogowych X.500* – 03.1998

### Advisor: Piotr Tatjewski

●M. Raczkowski: *Symulator obiektów dynamicznych dla systemu Windows NT* – 03.2000
●D. Mularczyk: *Symulator obiektów dynamicznych, rozbudowa oprogramowania, testowanie na złożonym procesie technologicznym* – 04.1999
●A. Majzel: *Symulator obiektów dynamicznych, rozbudowa oprogramowania, testowanie na złożonym procesie technologicznym* – 03.1999
●P. Tomkiewicz: *Środowisko optymalizacji punktów pracy procesów na bazie metody zintegrowanej optymalizacji i adaptacji parametrów* – 06.1998
●M.K. Sikora, R.M. Puź: *Symulator obiektów dynamicznych* – 03.1998
●P. Szczepkowski: *Lokalna stacja operatora procesu* – 10.1997

### Advisor: Eugeniusz Toczyłowski

●Z. Pastuszka: *Moduł wspomagający dział sprzedaży w przedsiębiorstwie wytwarzającym napoje gazowane* – 11.2000

●J. Karwatka: *Harmonogramowanie wybranych dyskretnych procesów produkcyjnych z wykorzystaniem metody generacji kolumn* – 10.2000

●M. Kaleta: *Wybrane metody planowania pracy systemu elektroenergetycznego w Polsce* – 10.2000 (with distinction)

●N. Kiepiel: *Wybrane metody harmonogramowania jednostek wytwórczych na scentralizowanym rynku energii elektrycznej* – 10.2000

●W. Nowak: *Harmonogramowanie pracy jednostek wytwórczych rynku energii przy istniejących ograniczeniach systemowych stworzonych przez generator modeli ograniczeń systemowych* – 10.2000

●I. Mileńko: *Zagadnienia wspomagania indywidualnego planowania generacji wytwórców na rynku energii elektrycznej* – 09.2000 (with distinction)

●L. Winiarski: *Metoda harmonogramowania zadań w modelach planowania przedsięwzięć z zasobami ograniczonymi chwilowo* – 12.1999

●T. Śliwiński: *Wykorzystanie metody generacji kolumn do rozwiązywania wybranych zadań harmonogramowania produkcji* – 09.1999 (with distinction)

●J. Piotrowski: *System informatyczny wspomagający konstrukcję portfeli inwestycyjnych* – 06.1999

●K. Sitkowski: *Rozwinięcie instalacji CIM symulującej działanie linii produkcyjnej* – 10.1998

●A. Litwin: *Stanowisko laboratoryjne do badania algorytmów sterowania operatywnego w modelu instalacji CIM* – 11.1997

●P. Walesiak: *Harmonogramowanie produkcji porcjami jednego wyrobu w warunkach niepewności zamówień* – 10.1997 (with distinction)

●P. Sobczyk: *System bazy danych dla systemów harmonogramowania produkcji w elastycznych systemach produkcyjnych* – 10.1997

### Advisor: Tomasz Traczyk

●L. H. Kuma/Ćmak: *Projektowanie i programowanie aplikacji z relacyjno-obiektową bazą danych* – 10.2000

●P. Piłaciński: *Systemy zarządzania przepływem pracy. Implementacja procesów biznesowych w środowisku ORACLE WORKFLOW* – 10.2000

●A. Wiśniewski: *Zastosowanie języka XML w systemach zarządzania przepływem pracy* – 10.2000

●A. Kalinowski: *System umożliwiający testowanie algorytmów układających plan zajęć* – 03.2000

●M. Jabłoński: *Symulator procesów produkcyjnych* – 03.1998

●A. Mazurczak: *System wnioskujący czasu rzeczywistego* – 09.1997

●K. Zadora-Przyłęcki: *Obiektowy system monitorowania produkcji* – 09.1997 (with distinction)

### Advisor: Wiesław Traczyk

●A. Karasiński: *Wnioskowanie na podstawie przypadków z warszawskiej Giełdy Papierów Wartościowych* – 11.2000

●K. Sudnik: *System ekspercki do wspomagania inwestowania na Giełdzie Papierów Wartościowych w W-wie* – 11.2000

●A. Kozieł: *Algorytm planowania w sztucznej inteligencji* – 09.2000

●P. Grudniak: *Uczenie się maszyn z wykorzystaniem rachunku podziałów* – 10.1998

●D. Starosta: *Zastosowanie systemu ekspertowego do wspomagania diagnostyki medycznej w pediatrii* – 03.1998

●B. Sławiński: *Algorytmy uczenia się maszyn z przykładów* – 03.1998

### Advisor: Andrzej Wierzbicki

●G. Kusio: *Scentralizowany system monitoringu telefonicznych central elektromechanicznych* – 10.1997

### Advisor: Adam Woźniak

●D. Domaniuk: *Projektowanie układów regulacji położenia o dużej dokładności* – 10.2000

●K. Preiskorn: *Projektowanie układów regulacji dla obiektów nieliniowych* – 10.1998

●M. Kwiatkowski: *Znajdowanie rozwiązania Friedmana w niekooperacyjnych supergrach bez uzależnień czasowych* – 10.1997

Advisor: Grzegorz Wójcik

●M. Tutak: *Bezpieczna wymiana danych w sieci Internet* – 10.1999
●T. Kozłowski: *ATM w lokalnych sieciach komputerowych* – 03.2000

Advisor: Kornel Wydro

●G. Wojtenko: *System teleusług z wykorzystaniem karty elektronicznej* – 10.1997

Advisor: Cezary Zieliński

●F. Alshamkany: *Implementacja algorytmu hybrydowego sterowania robota z wykorzystaniem systemu operacyjnego czasu rzeczywistego QNX* – 07.1999
●J. Sawoniewicz: *Specjalizowany język wysokiego poziomu przeznaczony do reaktywnego sterowania robotami* – 07.1999
●A. Miron: *Metody wyznaczania map głębi w systemach stereowizyjnych robotów przemysłowych* – 12.1998

## 5.4   B.Sc. Degrees

B.Sc. degrees awarded in the period 1998–2000

Advisor: Agnieszka Bogobowicz

●M. Namavar: *Controlling the inverted pendulum by fuzzy logic approach* – 07.2000
●M. Domański: *The self-controlled neural network for controlling an inverted pendulum* – 10.2000

Advisor: Piotr Bolek

●R. Czapliński: *Interfejs do konta pocztowego z wykorzystaniem protokółu HTTP* – 03.2000

Advisor: Janusz Granat

●M. Nawalny: *Przetwarzanie i analiza danych w architekturze klient-serwer* – 10.2000
●M. Lewandowski: *Metody i narzędzia wspomagające proces zasilania hurtowni danych* – 10.2000

Advisor: Jerzy Gustowski

●G. Jędrzejewski: *Manipulator dwuosiowy jako obiekt laboratoryjny sterowania binarnego* – 03.2000
●K. Popończyk: *Symulacja wybranych obiektów sterowania w środowisku systemu ISAGRAF* – 10.1999
●D. Bagiński, M. Stalewski: *Autonomiczny sterownik silnika liniowego* – 10.1998

Advisor: Andrzej Karbowski

●M. Wanatowski: *Badania porównawcze metod optymalizacji równoległej z dekompozycją bezpośrednią* – 10.2000

Advisor: Włodzimierz Kasprzak

●A. Okazaki: *Projekt systemu do testowania metod detekcji ruchu w sekwencji obrazów* – 10.2000
●T. Olejniczak: *System wstępnej detekcji obiektów ikonicznych zadanej klasy w obrazie cyfrowym* – 10.2000

Advisor: Jan Mulawka (Institute of Electronic Systems)

●G. Tomczuk: *Optymalizacja sekwencji odcinków DNA przeznaczonych do konstrukcji bramek logicznych* – 03.1999

Advisor: Ewa Niewiadomska-Szynkiewicz

●S. Osiecki: *Badanie metod symulowanego wyżarzania* – 10.2000
●A. Sikora: *Biblioteka algorytmów synchronizacji w symulacji rozproszonej* – 10.2000

Advisor: Krzysztof Nowosad

●G. Kucharski: *Regulator pracy silnika spalinowego wykonany w technice analogowej* – 03.2000
●D. Poszelężny: *Sterowanie w procesie odsiarczania gazów poprocesorowych* – 03.2000
●J. Marcinek, J. Kapuściak: *Rola i zadania systemów SCADA. System Win CC firmy Siemens* – 10.1998

Advisor: Grzegorz Płoszajski

●P. Jeżowski: *Replikacja danych w systemach bazodanowych* – 03.2000

Advisor: Tadeusz Rogowski

●D. Łoniewski: *Przesyłanie głosu w sieciach komputerowych* – 10.2000
●P. Szalbierz: *Przesyłanie głosu w sieciach Frame Relay* – 10.2000
●Q. Madej: *Przesyłanie głosu w sieciach ATM* – 10.2000
●M. Sidorowicz: *Serwer strumieniowy sekwencji audio/video* – 03.2000

Advisor: Andrzej Rydzewski

●M. Fijałkowski: *Emulator pamięci EPROM* – 10.2000
●M. Gałach: *Wzmacniacz audio ze sterownikiem mikroprocesorowym* – 10.1999
●K. Dziekanowski: *System symulatora dydaktycznego dla laboratorium Techniki Mikroprocesorowej* – 10.1999

Advisor: Franciszek Seredyński

●A. Mroczkowski: *Rozproszone szeregowanie zadań w systemach wieloprocesorowych z dekompozycją kryterium optymalizacji* – 03.2000

Advisor: Jacek Szymanowski

●R. Lewczuk: *Biblioteka IPC w systemie Minix 2.0* – 10.1999
●A. Pogorzelski: *Opracowanie laboratoryjnej wersji systemu Minix 2.0* – 03.1999

Advisor: Wojciech Szynkiewicz

●T. Iwaszkiewicz: *Okienkowy interfejs użytkownika do sterownika wielorobotowego MRROC++* – 03.2000
●M. Burakowski: *Wizualizacja i animacja robotów w systemie AVS/Express* – 05.1999

Advisor: Eugeniusz Toczyłowski

●M. Kaleta: *Wybrane rozszerzenia i modyfikacje algorytmu dobowego planowania pracy jednostek wytwórczych na rynku energii elektrycznej SOREE* – 09.1999 (ocena celująca)

Advisor: Michał Warchoł

●I. Żuber: *Rozszerzenie serwera WWW pod systemem Windows NT. Zastosowanie technologii ISAPI* – 03.2000

Advisor: Adam Woźniak

●J. Sobieszek: *Metody rozwiązywania gier kooperacyjnych* – 10.2000
●C. Chudzian: *Znajdowanie rozwiązań arbitrażowych dla gier dwuosobowych* – 10.2000
●D. Domaniuk: *Projektowanie układów regulacji położenia* – 10.1999
●D. Marchel: *Projektowanie serwomechanizmu położenia* – 07.1999

Advisor: Kornel Wydro

●Abdallah Ally: *Systemy kontroli dostępu do pomieszczeń* – 10.1999

Advisor: Maciej Żmuda

●R. Olechowski: *Biblioteka metod optymalizacji nieliniowej w języku Java* – 10.2000

# 6 Publications

## 6.1 Monographs

### 6.1.1 Scientific or Technical Books

[B1] Włodzimierz Kasprzak, *Adaptive Computation Methods in Digital Image Sequence Analysis*, Prace Naukowe Politechniki Warszawskiej, Elektronika, Vol. 127, Oficyna Wydawnicza Politechniki Warszawskiej, 2000

[B2] Andrzej Pacut, *Stochastic Modeling at Diverse Scales: From Poisson to Network Neurons*, Prace Naukowe Politechniki Warszawskiej, Elektronika, Vol. 125, Oficyna Wydawnicza Politechniki Warszawskiej, 2000

[B3] Andrzej P. Wierzbicki, Marek Makowski, Jaap Wessels, *Model-Based Decision Support Methodology with Environmental Applications*, Kluwer Academic Publishers, Dordrecht, London, Boston, 2000

### 6.1.2 Chapters in scientific or technical books

[Ch1] Paweł D. Domański, "Stability Analysis and Industrial Application of Fuzzy Logic Multi - Regional Controllers", in Javier Aracil, Francisco Gordillo (Eds.) *Stability Issues in Fuzzy Control*, Studies in Fuzziness and Soft Computing, pp. 241–254, Physica - Verlag, 2000

[Ch2] Paweł D. Domański, "Zastosowanie metod soft computingu do minimalizacji emisji $NO_x$ (Transition Technologies)", Ch. 10.3 in *Niskoemisyjne techniki spalania w energetyce*, pp. 251–260, Oficyna Wydawnicza Politechniki Wrocławskiej, 2000

[Ch3] Janusz Granat, Marek Makowski, "Interfaces", Ch. 10 in [B3], 2000

[Ch4] Janusz Granat, Marek Makowski, Andrzej P. Wierzbicki, "Optimization Tools", Ch. 7 in [B3], 2000

[Ch5] Marek Makowski, Andrzej P. Wierzbicki, "Architecture of Decision Support Systems", Ch. 3 in [B3], 2000

[Ch6] Sabine Messner, Manfred Strubegger, Andrzej P. Wierzbicki, "Energy Planning", Ch. 14 in [B3], 2000

[Ch7] Jerzy Paczyński, Marek Makowski, Andrzej P. Wierzbicki, "Modeling Tools", Ch. 6 in [B3], 2000

[Ch8] Jaap Wessels, Andrzej P. Wierzbicki, "Model-Based Decision Support", Ch. 1 in [B3], 2000

[Ch9] Andrzej P. Wierzbicki, "Reference Point Methodology", Ch. 4 in [B3], 2000

[Ch10] Andrzej P. Wierzbicki, "Multi-Objective Modeling", Ch. 5 in [B3], 2000

[Ch11] Andrzej P. Wierzbicki, "Multi-Objective and Referance Point Optimization Tools", Ch. 8 in [B3], 2000

[Ch12] Andrzej P. Wierzbicki, Hirotaka Nakayama, "Tools Supporting Choice", Ch. 9 in [B3], 2000

[Ch13] Andrzej P. Wierzbicki, Jaap Wessels, "The Modern Decision Maker", Ch. 2 in [B3], 2000

## 6.2 Scientific and Technical Papers in Journals

(*) denotes publications in Philadelphia List journals

### 6.2.1 International Journals

[*J1] Władysław Findeisen, "Hierarchical control structures", *Control and Cybernetics*, Vol. 29, No. 1, pp. 69–78, 2000

[*J2] Janusz Granat, Marek Makowski, "Interactive specification and analysis of aspiration – based preferences", *European Journal of Operational Research"*, vol. 122, pp. 469–485, 2000

[J3]    Włodzimierz Kasprzak, "Adaptive methods of Moving Car Detection in Monocular Image Sequences", *International Journal Machine Graphic and Vision*, Vol. 9, No. 1–2, pp. 167–185, 2000

[J4]    Wojciech Lis, Włodzimierz Kasprzak, "Semi – Automatic Detection of Cartographic Objects in Digital Images", *International Journal Machine Graphic and Vision*, Vol. 9, No. 1–2, pp. 447–452, 2000

[J5]    Radosław Ładziński, "An outline the linear control system synthesis by a proper, stable rational functions approach", *Archives of Control Science*, Vol. 7, No. 3–4, pp. 241–265, 2000

[J6]    Przemysław Magiera, Andrzej Karbowski, "Infinite Time Horizon Optimal Control with Expected Value – Variance Criteria Made Possible by Decomposed Optimization" *Zeszyty Naukowe Uniwersytetu Jagiellońskiego*, seria Prace Informatyczne, Zesz. 10, pp. 6–81, 2000

[*J7]   Krzysztof Malinowski, "Optimization of operative decisions; computer analysis", *Control and Cybernetics*, Vol. 29, No. 1, pp. 257–274, 2000

[*J8]   Włodzimierz Ogryczak, "Multiple criteria linear programming model for portfolio selection", *Annals of Operations Rerearch*, Vol. 97, pp. 143–162, 2000

[*J9]   Włodzimierz Ogryczak, "On the distribution approach to location problems", *Computers & Industrial Engineering*, Vol. 37 (1999), pp. 595–612, 2000

[*J10]  Włodzimierz Ogryczak, Andrzej Ruszczyński, "On consistency of stochastic dominance and mean-semideviation models", *Mathematical Programming*, Ser. B, Vol. 89, pp. 217–232, 2000

### 6.2.2   Local Journals

[LJ1]   Włodzimierz Ogryczak, "Wielokryterialne podejście do zadań lokalizacyjnych", *Zeszyty Naukowe Politechniki Śląskiej, seria Automatyka*, Vol. 130, pp. 149–158, 2000

[LJ2]   Cezary Szwed, "Sposoby modelowania i metody rozwiązywania problemów układania zajęć", *Zeszyty Naukowe Politechniki Śląskiej, seria Automatyka*, Vol. 130, pp. 352–358, 2000

[LJ3]   Cezary Szwed, Eugeniusz Toczyłowski, "Optymalizacja rozdziału zasobów lokalowych w warunkach elastycznego studiowania", *Zeszyty Naukowe Wydziału Mechanicznego Politechniki Koszalińskiej*, pp. 308–316, 2000

[LJ4]   Eugeniusz Toczyłowski, "Optymalizacja obrotu wielotowarowego na pojedynczym nośniku", *Zeszyty Naukowe Politechniki Śląskiej, seria Automatyka*, Vol. 130, pp. 171–179, 2000

[LC5]   Eugeniusz Toczyłowski, Izabela Mileńko, "Optymalizacja generacji elektrowni cieplnej w warunkach ryzyka rynkowego", *Zeszyty Naukowe Politechniki Śląskiej, seria Automatyka*, Vol. 130, pp. 141–148, 2000

[LC6]   Eugeniusz Toczyłowski, Krzysztof Tomczyk, Karol Zadora-Przyłęcki, "Rynkowe modele optymalizacyjne bilansowania systemu elektroenergetycznego z uwzględnieniem ograniczeń systemowych", *Zeszyty Naukowe Politechniki Śląskiej, seria Automatyka*, Vol. 130, pp. 148–158, 2000

[LC7]   Eugeniusz Toczyłowski, Artur Walczak, Mariusz Kaleta, "Algorytm harmonogramowania pracy jednostek wytwórczych w systemie elektroenergetycznym", *Zeszyty Naukowe Politechniki Śląskiej, seria Automatyka*, Vol. 130, pp. 159–170, 2000

## 6.3   Scientific and Technical Papers in Conference Proceedings

### 6.3.1   International Conference Proceedings

[IC1]   Piotr Arabas, Krzysztof Malinowski, "Hierarchical Air Defense System; Periodic and Initial Coordination", *Proceedings of the Sixth International Conference on Methods and Models in Automation and Robotics MMAR'2000*, Międzyzdroje, Poland, Vol. 1, pp. 199–204, 2000

[IC2]    Wojciech Barański, Krzysztof Pieńkosz, "A Multi-Agent Approach to Production Control under Uncertainty", *Proceedings of the Sixth International Conference on Methods and Models in Automation and Robotics MMAR'2000*, Międzyzdroje, Poland, Vol. 2, pp. 829–834, 2000

[IC3]    Agnieszka Bogobowicz, "Information-Retrieval in Non-Linear Hyperbolic Systems", *Intelligent Systems and Control, Proceedings of the IASTED International Conference*, Honolulu, Hawaii, USA, pp. 280–282, IASTED, 2000

[IC4]    Agnieszka Bogobowicz, L. Rothenburg, "Flow Process Recognition in Anisotropic Network", *Applied Simulation and Modelling, Proceedings of the IASTED International Conference* Banff, Alberta, Canada, pp. 305–311, IASTED, 2000

[IC5]    Jarosław Chrobak, Andrzej Pacut, Andrzej Karbowski, "Dynamic programming with ARMA, Markov, and NARMA models vs. Q-learning – Case study", *Neural Computing: New Challenges and Perspectives for the New Millennium, Proceedings of the IEEE – INNS – ENNS International Joint Conference on Neural Networks IJCNN 2000*, Como, Italy, pp. 265–272, IEEE, 2000

[IC6]    Wiktor Daszczuk, Piotr Gawrysiak, Tomasz Gerszberg, Marzena Kryszkiewicz, Jerzy Mieścicki, Mieczysław Muraszkiewicz, Michał Okoniewski, Henryk Rybiński, Tomasz Traczyk, Zbigniew Walczak: "Data Mining for Technical Operation of Telecommunications Companies: a Case Study", *World Multiconference on Systemics, Cybernetics and Informatics SCI 2000 Proceedings*, Orlando, Florida, USA, Vol. VIII: Computer Science and Engineering, part II, pp. 64–69, International Institute of Informatics and Systemics, 2000

[IC7]    Paweł D. Domański, Konrad Świrski, Wiesław Jedynak, "Application of Advanced Control Technologies to the Emission Control and Boiler Optimization", *Distributed Control Systems 6th Meeting DCS – 6*, Miscolc, Hungary, pp. 1–17, 2000

[IC8]    Jack Gabor, Daniel Pakulski, Konrad Świrski, Paweł D. Domański, "Closed Loop NO$_x$ Control and Optimisation Using Neural Networks", *IFAC Symposium on Power Plants & Power Systems Control 2000, Preprints*, Brussels, Belgium, pp.188–193, IFAC, 2000

[IC9]    Mariusz Kamola, Krzysztof Malinowski, "Simulator-Optimizer Approach to Planning of Plant Operation: Ill-Defined Simulator Case", *IFAC – MIM 2000, Symposium on Manufacturing, Modeling, Management and Control*, Rio Patras, Greece, pp. 377–382, IFAC, 2000

[IC10]  Andrzej Karbowski, Jarosław Chrobak, "Application of Simulation and Neurodynamic Programming to Optimal Portfolio Selection", *2000 Advanced Simulation Technologies Conference, Proceedings of the Business and Industry Simulation Symposium*, Washington, USA, pp. 203–207, SCS, 2000

[IC11]  Robert Kobyliński, Andrzej Karbowski, 'Windows Distributed Machine (WDM) System – the First Step to Distributed Simulation World", *2000 Advanced Simulation Technologies Conference, Proceedings of the High Performance Computing Symposium – HPC 2000*, Washington, USA, pp. 295–301, SCS, 2000

[IC12]  Maciej Ławryńczuk, Piotr Tatjewski, "Neural Inverse Modelling for Disturbance Compensation in a Nonlinear Plant Control", *Proceedings of the Sixth International Conference on Methods and Models in Automation and Robotics MMAR'2000*, Międzyzdroje, Poland, Vol. 2, pp. 721–726, 2000

[IC13]  Piotr Marusak, Piotr Tatjewski, "Fuzzy Dynamic Matrix Control Algorithms for Nonlinear Plants", *Proceedings of the Sixth International Conference on Methods and Models in Automation and Robotics MMAR'2000*, Międzyzdroje, Poland, Vol. 2, pp. 749–754, 2000

[IC14]  K. Mianowski, K. Nazarczuk, M. Wojtyra, W. Szynkiewicz, C. Zieliński, A. Woźniak, "Application of the RNT Robot to Milling and Polishing", *ROMANSY 13 Theory and Practice of Robot and Manipulators, Proceedings of the Thirteenth CISM-IFToMM Symposium*, Zakopane, Poland, Springer Wien NewYork, Courses and Lectures No. 20, pp. 421–430, 2000

[IC15]  Ewa Niewiadomska-Szynkiewicz, "Development of Flood Control Methodologies Based on Computer Simulation", *2000 Advanced Simulation Technologies Conference, Proceedings of the Business and Industry Simulation Symposium*, Washington, USA, pp. 100–105, SCS, 2000

[IC16] Ewa Niewiadomska-Szynkiewicz, "Decision Delay in Operation of Water Reservoir During Flood", *Proceedings of the Sixth International Conference on Methods and Models in Automation and Robotics MMAR'2000*, Międzyzdroje, Poland, Vol. 1, pp. 205–211, 2000

[IC17] Andrzej Pacut, "The basic diffusion model neuron cannot learn", *Neural Computing: New Challenges and Perspectives for the New Millennium, Proceedings of the IEEE - INNS - ENNS International Joint Conference on Neural Networks IJCNN 2000*, Como, Italy, pp. 153–158, IEEE, 2000

[IC18] Andrzej Pacut, Wojtek Kolodziej, Sławomir Soszyński, "Comparison of optimal and ANN nonlinear feedback controllers" *Telecomunications/Signal Processing, Seventh International Conference on Advances in Communication and Control ComCon 7 – 1999 Proceedings*, Athens, Greece, pp. 819– 826, Optimization Software Inc., New York, 2000

[IC19] Wojciech Szynkiewicz, "Game-Theoretic Approach to Multi-Robot Motion Planning and Control", *Proceedings of the Sixth International Conference on Methods and Models in Automation and Robotics MMAR'2000*, Międzyzdroje, Poland, Vol. 2, pp. 555–560, 2000

[IC20] Michał Warchoł, "Development of Least-Cost Sewage-Treatment Plants Distribution, Case Study Results", *43th Spring International Conference Modelling and Simulation of Systems MOSIS 2000 Proceedings*, Roznov, Czech Republic, Vol. 1, pp. 231–237, 2000

### 6.3.2   Local Conferences Proceedings

[LC1] Mariusz Kaleta, Eugeniusz Toczyłowski, Artur Walczak, "Randomizacja algorytmu harmonogramowania pracy jednostek wytwórczych na rynku energii elektrycznej", *Materiały IV Krajowej Konferencji Algorytmy Ewolucyjne i Optymalizacja Globalna*, Lądek Zdrój, pp. 99–106, 2000

[LC2] Mariusz Kaleta, Eugeniusz Toczyłowski, Artur Walczak, "Planowanie pracy jednostek wytwórczych na rynku energii elektrycznej", *II Ogólnopolskie Warsztaty Doktoranckie OWD'2000, Archiwum Konferencji PTETiS*, Istebna – Zaolzie, Poland, Vol. 9, pp. 209–214, 2000

[LC3] Mariusz Kamola, "Wykorzystanie ciągów Sobola do wyznaczania początkowej puli punktów algorytmów optymalizacji", *Materiały IV Krajowej Konferencji Algorytmy Ewolucyjne i Optymalizacja Globalna*, Lądek Zdrój, pp. 107–113, 2000

[LC4] Maciej Ławryńczuk, "Wykorzystanie sieci neuronowych do modelowania silnie nieliniowych procesów", *AUTOMATION 2000 Konferencja Naukowo – Techniczna Automatyzacja – Nowości i Perspektywy*, Warszawa, pp. 293–300, 2000

[LC5] Piotr Marusak, "Zastosowanie systemu wspomagania projektowania algorytmów regulacji do testowania regulatorów nieliniowych", *AUTOMATION 2000 Konferencja Naukowo – Techniczna Automatyzacja – Nowości i Perspektywy*, Warszawa, pp. 63–70, 2000

[LC6] Izabela Mileńko, Eugeniusz Toczyłowski, "Wspomaganie indywidualnego planowania generacji na rynku energii elektrycznej", *Materiały VII Konferencji Naukowo – Technicznej Rynek Energii Elektrycznej: Rozwój i harmonizacja struktur REE'2000*, Kazimierz Dolny, Poland, Vol. II, pp. 63–70, 2000

[LC7] Sebastian Plamowski, Paweł D. Domański, "Ewolucyjna identyfikacja struktury modeli NARMAX", *Materiały IV Krajowej Konferencji Algorytmy Ewolucyjne i Optymalizacja Globalna*, Lądek Zdrój, pp. 171–179, 2000

[LC8] Krzysztof Sacha, "Analiza bezpieczeństwa systemów programowanych", *Materiały Ogólnopolskiej Konferencji Naukowo-Technicznej Real-Time System'2000*, Kraków, pp. 62–71, 2000

[LC9] Tomasz Śliwiński, Eugeniusz Toczyłowski, "Harmonogramowanie produkcji wieloasortymentowej na elastycznej linii produkcyjnej za pomocą techniki generacji kolumn", *II Ogólnopolskie Warsztaty Doktoranckie OWD'2000, Archiwum Konferencji PTETiS*, Istebna – Zaolzie, Poland, Vol. 9, pp. 168–173, 2000

[LC10] Eugeniusz Toczyłowski, "Jaki powinien być perspektywicznie optymalny rynek energii elektrycznej", *Materiały Pokonferencyjne VII Konferencji Naukowo – Technicznej Rynek Energii Elektrycznej: Rozwój i harmonizacja struktur REE'2000*, Kazimierz Dolny, Poland, pp. 73–93, 2000

[LC11] Eugeniusz Toczyłowski, Karol Zadora-Przyłęcki, Krzysztof Tomczyk, "Usuwanie przekroczenia ograniczeń sieciowych na rynku energii elektrycznej za pomocą metody cen węzłowych", *Materiały VII Konferencji Naukowo – Technicznej Rynek Energii Elektrycznej: Rozwój i harmonizacja struktur REE'2000*, Kazimierz Dolny, Poland, Vol. II, pp. 129–138, 2000

[LC12] Krzysztof Tomczyk, Eugeniusz Toczyłowski, Karol Zadora-Przyłęcki, "Zastosowanie metody cen węzłowych do usuwania przekroczeń ograniczeń sieciowych na rynku energii elektrycznej", *II Ogólnopolskie Warsztaty Doktoranckie OWD'2000, Archiwum Konferencji PTETiS*, Istebna – Zaolzie, Poland, Vol. 9, pp. 225–230, 2000

[LC13] Tomasz Traczyk, "Język XSL", *VI Konferencja użytkowników i developerów ORACLE, Systemy informatyczne w dobie Internetu*, Warsaw, pp. 120-136, Stowarzyszenie Polskiej Grupy Użytkowników Systemu Oracle, 2000

[LC14] Artur Walczak, Eugeniusz Toczyłowski, "Wspomaganie decyzji planowania dobowego na hurtowni rynku energii elektrycznej", *Prace XVIII Ogólnopolskiej Konferencji Polioptymalizacja i Komputerowe Wspomaganie Projektowania*, Mielno, pp. 333–340, Zeszyty Naukowe Wydziału Mechanicznego Politechniki Koszalińskiej, 2000

[LC15] Marcin Włodarczyk, Ewa Niewiadomska-Szynkiewicz, "Metody hierarchiczne w zadaniach optymalizacji inwestycji", *Materiały IV Krajowej Konferencji Algorytmy Ewolucyjne i Optymalizacja Globalna*, Lądek Zdrój, pp. 261–272, 2000

[LC16] Adam Woźniak, "Rozwiązanie arbitrażowe – sprawiedliwy wynik przetargu", *Materiały IV Krajowej Konferencji Algorytmy Ewolucyjne i Optymalizacja Globalna*, Lądek Zdrój, pp. 273–291, 2000

## 6.4 Other publications and reports

### 6.4.1 Conference Abstracts

[A1] Agnieszka Bogobowicz, "Measure of Information Loss in Non-linear Hyperbolic Systems", *14th International Symposium of Mathematical Theory of Networks and Systems MTNS 2000*, 19–23 June 2000, Perpignan, France

[A2] Agnieszka Bogobowicz, "Algorithm for Process Recognition in Non-linear Hyperbolic Systems", *Jubileuszowe X Sympozjum Środowiskowe PTZE, Zastosowania elektromagnetyzmu w nowoczesnych technikach i informatyce PTZE'2000*, 3–5 July 2000, Cedzyna, Poland

[A3] Janusz Granat, Francesca Guerriero, "Multicriteria Routing using the Reference Point Method", *14th JISR-IIASA Workshop on Methodologies and Tools for Complex System Modeling and Integrated Policy Assessment*, 3–5 July 2000

[A4] Włodzimierz Ogryczak, "LP Solvalable Models for Decisions under risk", *14th JISR-IIASA Workshop on Methodologies and Tools for Complex System Modeling and Integrated Policy Assessment*, 3–5 July 2000

[A5] Włodzimierz Ogryczak, Andrzej Ruszczyński, "On Stochastic Dominance and Mean-Semideviation Models", *17th International Symposium on Mathematical Programming ISMP'2000*, 7-11 August 2000, Georgia, USA

[A6] Eugeniusz Toczyłowski, "Preemptive Scheduling of Independent Tasks in the Presence of Setup Times and Renewable Resources", *17th International Symposium on Mathematical Programming ISMP'2000*, 7–11 August 2000, Georgia, USA

[A7] Eugeniusz Toczyłowski, Artur Walczak, "Scheduling Generation on the Energy Balancing Market", *7th International Workshop on Project Management and Scheduling*, 17–19 April 2000, Osnabruck, Germany

### 6.4.2 Unreferred Publications

[UJ1] Tomasz Kruk, "Rozwiązania klastrowe jako metoda zwiększania niezawodności systemów komputerowych", *IT.FORUM SECURE2000, Bezpieczeństwo — być na bieżąco*, Warszawa, 18–19 October 2000, pp. 1–7

[UJ2] Tomasz Traczyk, "XML i XSL", *Dwunasta Górska Szkoła PTI, Architektury systemów informatycznych dla gospodarki elektronicznej*, Szczyrk, 26–30 June 2000, pp. 31-37

### 6.4.3 Reports

[R1] Piotr Arabas, "Zastosowanie koordynacji bezpośredniej w hierarchicznym systemie obrony przeciwrakietowej", *Raporty Instytutu Automatyki i Informatyki Stosowanej Politechniki Warszawskiej*, No. 00–4, 2000

[R2] Jarosław Arabas, "Miara w przestrzeni genotypów a algorytmy ewolucyjne", *Raporty Instytutu Automatyki i Informatyki Stosowanej Politechniki Warszawskiej*, No. 00–9, 2000

[R3] Jadwiga Daniluk, Sylwester Tyszewski, Michał Warchoł, "Hierarchizacja przedsięwzięć w zakresie ochrony jakości wód", *Raporty Instytutu Automatyki i Informatyki Stosowanej Politechniki Warszawskiej*, No. 00–18, 2000

[R4] Mariusz Kaleta, Konrad Kamiński, Eugeniusz Toczyłowski, Krzysztof Tomczyk, Izabela Żółtowska, "System wspomagania uczestnika na rynkach energii elektrycznej", *Raporty Instytutu Automatyki i Informatyki Stosowanej Politechniki Warszawskiej*, No. 00–21, 2000

[R5] Andrzej Karbowski, Przemysław Magiera, "Metody dualne programowania liniowego w markowowskich zadaniach optymalnej syntezy", *Raporty Instytutu Automatyki i Informatyki Stosowanej Politechniki Warszawskiej*, No. 00–7, 2000

[R6] Włodzimierz Kasprzak, "Adaptacyjna metoda detekcji obiektów w obrazach cyfrowych", *Raporty Instytutu Automatyki i Informatyki Stosowanej Politechniki Warszawskiej*, No. 00–16, 2000

[R7] Maciej Ławryńczuk, "Modele z wydzielonym członem statycznym - identyfikacja i wykorzystanie w sterowaniu", *Raporty Instytutu Automatyki i Informatyki Stosowanej Politechniki Warszawskiej*, No. 00–3, 2000

[R8] Maciej Ławryńczuk, Piotr Marusak, "REGZA – pakiet oprogramowania do projektowania układów regulacji zaawansowanej– instrukcja użytkownika (wer. 1.0)", *Raporty Instytutu Automatyki i Informatyki Stosowanej Politechniki Warszawskiej*, No. 00–11, 2000

[R9] Piotr Marusak, "Algorytm regulacji DMC z uwzględnieniem ograniczeń nałożonych na wartości wyjść obiektu regulacji", *Raporty Instytutu Automatyki i Informatyki Stosowanej Politechniki Warszawskiej*, No. 00–5, 2000

[R10] Wojtek Michalowski, Włodzimierz Ogryczak, "Extending the MAD Portfolio Optimization Model to Incorporate Downside Risk Aversion", *Working Paper Faculte d'Administration, Universite d'Ottawa*, No 00–49, 2000

[R11] Ewa Niewiadomska-Szynkiewicz, "Struktury i algorytmy sterowania dla złożonych systemów; metody obliczeniowe i zastosowania", *Raporty Instytutu Automatyki i Informatyki Stosowanej Politechniki Warszawskiej*, No. 00–23, 2000

[R12] Ewa Niewiadomska-Szynkiewicz, "Wspomagana komputerem analiza i synteza układów sterowania dla złożonych systemów", *Raporty Instytutu Automatyki i Informatyki Stosowanej Politechniki Warszawskiej*, No. 00–12, 2000

[R13] Włodzimierz Ogryczak, "Stochastic Dominance and LP Solvable Models for Portfolio Optimization", *Raporty Instytutu Automatyki i Informatyki Stosowanej Politechniki Warszawskiej*, No. 00–24, 2000

[R14] Włodzimierz Ogryczak, Mariusz Zawadzki, "Conditional Center, A Parametric Solution Concept for Location Problems", *Raporty Instytutu Automatyki i Informatyki Stosowanej Politechniki Warszawskiej*, No. 00–25, 2000

[R15] Andrzej Pacut, Jarosław Chrobak, Dariusz Radomski, "Sieci neuronowe do celów identyfikacji i sterowania", *Raporty Instytutu Automatyki i Informatyki Stosowanej Politechniki Warszawskiej*, No. 00–8, 2000

[R16] Marek Publicewicz, Ewa Niewiadomska-Szynkiewicz, "Biblioteka generatorów losowych i metod optymalizacji globalnej", *Raporty Instytutu Automatyki i Informatyki Stosowanej Politechniki Warszawskiej*, No. 00–14, 2000

[R17] Marek Publicewicz, Robert Śliwiński, Ewa Niewiadomska-Szynkiewicz, Piotr Bolek, "VSO–Środowisko graficzne do badania algorytmów optymalizacji (wer. 2)", *Raporty Instytutu Automatyki i Informatyki Stosowanej Politechniki Warszawskiej*, No. 00–13, 2000

[R18] Wojciech Szynkiewicz, Adam Woźniak, "Identyfikacja, projektowanie i implementacja serwomechanizmów osi dla manipulatora robota POLYCRANK" CATID, *Raporty Instytutu Automatyki i Informatyki Stosowanej Politechniki Warszawskiej*, No. 00–17, 2000

[R19] Tomasz Śliwiński, "Przegląd technik generacji kolumn", *Raporty Instytutu Automatyki i Informatyki Stosowanej Politechniki Warszawskiej*, No. 00–20, 2000

[R20] Piotr Tatjewski, "Optimizing control of slow-varying non-stationary plants under uncertainty", *Raporty Instytutu Automatyki i Informatyki Stosowanej Politechniki Warszawskiej*, No. 00–15, 2000

[R21] Jakub Witkowski, Adam Woźniak, "Metody aproksymacji zbioru Pareto", *Raporty Instytutu Automatyki i Informatyki Stosowanej Politechniki Warszawskiej*, No. 00–19, 2000

# 7    International Conferences — Organization and/or Participation

[Conf1] *IEEE – INNS – ENNS International Joint Conference on Neural Networks IJCNN 2000*, 24–27 July 2000, Como, Italy

Participation: Andrzej Pacut, Jarosław Chrobak

[Conf2] *43th Spring International Conference Modelling and Simulation of Systems MOSIS 2000 Proceedings*, 2–4 May 2000, Roznov, Czech Republic.

Participation: Michał Warchoł.

[Conf3] *Distributed Control Systems 6th Meeting DCS – 6*, 25–27 October 2000, Miscolc, Hungary.

Participation: Paweł D. Domański.

[Conf4] *IFAC Symposium on Power Plants & Power Systems Control 2000, Preprints*, 26–29 April 2000, Brussels, Belgium.

Participation: Paweł D. Domański.

[Conf5] *IFAC – MIM 2000, Symposium on Manufacturing, Modeling, Management and Control*, 12–14 July 2000, Rio Patras, Greece.

Participation: Mariusz Kamola.

[Conf6] *World Multiconference on Systemics, Cybernetics and Informatics SCI 2000*, 23–26 July 2000, Orlando, Florida, USA.

Participation: Tomasz Traczyk.

[Conf7] *Applied Simulation and Modelling, Proceedings of the IASTED International Conference* 24–26 July 2000, Banff, Alberta, Canada.

Participation: Agnieszka Bogobowicz.

[Conf8] *Intelligent Systems and Control, the IASTED International Conference*, 14–16 August 2000, Honolulu, Hawaii, USA.

Participation: Agnieszka Bogobowicz.

[Conf9] *2000 Advanced Simulation Technologies Conference, Proceedings of the High Performance Computing Symposium – HPC 2000*, 16–20 April 2000, Washington, USA.

Participation: Andrzej Karbowski.

[Conf10] *2000 Advanced Simulation Technologies Conference, Proceedings of the Business and Industry Simulation Symposium*, Washington, USA.

Participation: Andrzej Karbowski, Jarosław Chrobak, Ewa Niewiadomska-Szynkiewicz.

[Conf11] *Sixth International Conference on Methods and Models in Automation and Robotics MMAR'2000*, 28–31 August 2000, Międzyzdroje, Poland.

**Krzysztof Malinowski – Program Committee member**.

Participation: Piotr Arabas, Paweł Domański, Krzysztof Malinowski, Ewa Niewiadomska-Szynkiewicz, Wojciech Szynkiewicz, Maciej Ławryńczuk, Piotr Tatjewski, Piotr Marusak, Krzysztof Pieńkosz.

[Conf12] *17th International Symposium on Mathematical Programming ISMP'2000*, 7–11 August 2000, Georgia, USA.

Participation: Włodzimierz Ogryczak, Eugeniusz Toczyłowski.

[Conf13] *14th International Symposium of Mathematical Theory of Networks and Systems MTNS 2000*, 19–23 June 2000, Perpignan, France.

Participation: Agnieszka Bogobowicz.

[Conf14] *14th JISR-IIASA Workshop on Methodologies and Tools for Complex System Modeling and Integrated Policy Assessment*, 3–5 July 2000, Laxenburg, Austria.

Participation: Janusz Granat, Włodzimierz Ogryczak.

[Conf15] *7th International Workshop on Project Management and Scheduling*, 17–19 April 2000, Osnabruck, Germany.

Participation: Eugeniusz Toczyłowski.

[Conf16] *2'nd Workshop on Constraint Programming for Decision and Control*, Gliwice, Poland.

**Eugeniusz Toczyłowski — Program Committee member.**

Participation: Eugeniusz Toczyłowski.

[Conf17] *IFAC/IFIP Workshop on Real-Time Programming*, 17–19 May 2000, Palma de Mallorca.

**Krzysztof Sacha — Program Committee member.**

Participation: Krzysztof Sacha.

[Conf18] *33rd Solid Mechanics Conference*, 5–9 September 2000, Zakopane, Poland.

Participation: Andrzej Stachurski.

[Conf19] *XII Krajowa Konferencja Automatyzacji Procesów Dyskretnych*, 13-16 September 2000, Zakopane, Poland.

**Eugeniusz Toczyłowski — Program Committee member.**

Participation: Eugeniusz Toczyłowski, Włodzimierz Ogryczak, Mariusz Kaleta, Izabela Mileńko, Krzysztof Pieńkosz, Cezary Szwed, Krzysztof Tomczyk, Artur Walczak.

[Conf20] *Ogólnopolska Konferencja Polioptymalizacja i Komputerowe Wspomaganie Projektowania*, 14-18 June 2000, Mielno, Poland.

Participation: Eugeniusz Toczyłowski, Izabela Mileńko, Cezary Szwed, Artur Walczak.

[Conf21] *II Konferencja Naukowo – Techniczna Rynek Energii Elektrycznej: Rozwój i harmonizacja struktur REE'2000*, 27–28 April 2000, Kazimierz Dolny, Poland.

**Eugeniusz Toczyłowski — Program Committee member.**

Participation: Eugeniusz Toczyłowski, Izabela Mileńko, Krzysztof Tomczyk.

[Conf22] *II Ogólnopolskie Warsztaty Doktoranckie OWD'2000, Archiwum Konferencji PTETiS*, 22–25 October 2000, Istebna – Zaolzie, Poland.

Participation: Mariusz Kaleta, Izabela Mileńko, Krzysztof Tomczyk, Tomasz Śliwiński, Artur Walczak.

[Conf23] *IV Krajowa Konferencja Algorytmy Ewolucyjne i Optymalizacja Globalna*, 5–8 June 2000, Lądek Zdrój, Poland.

**Krzysztof Malinowski — Program Committee Chairman,**

**Paweł Domański, Ewa Niewiadomska-Szynkiewicz — Organizing Committee members.**

Participation: Paweł Domański, Krzysztof Malinowski, Ewa Niewiadomska-Szynkiewicz, Adam Woźniak, Mariusz Kaleta, Mariusz Kamola.

[Conf24] *VI Konferencja użytkowników i developerów ORACLE, Systemy informatyczne w dobie Internetu*, 24-28 October 2000, Zakopane, Poland.

Participation: Tomasz Traczyk.

[Conf25] *AUTOMATION 2000 Konferencja Naukowo – Techniczna Automatyzacja – Nowości i Perspektywy*, 12–14 April 2000, Warsaw, Poland.

Participation: Maciej Ławryńczuk, Piotr Marusak.

[Conf26] *VII Konferencja Sieci Komputerowe 2000*, 14–16 July 2000, Zakopane, Poland.

Participation: Michał Malarski.

[Conf27] *Jubileuszowe X Sympozjum Środowiskowe PTZE, Zastosowania elektromagnetyzmu w nowoczesnych technikach i informatyce PTZE'2000*, 3–5 July 2000, Cedzyna, Poland.

Participation: Agnieszka Bogobowicz.

[Conf28] *IT.FORUM SECURE2000, Bezpieczeństwo — być na bieżąco*.
Participation: Tomasz J. Kruk

[Conf29] *Dwunasta Górska Szkoła PTI, Architektury systemów informatycznych dla gospodarki elektronicznej*, Szczyrk, 26–30 June 2000.
Participation: Tomasz Traczyk