



POLISH ACADEMY OF SCIENCES
Systems Research Institute

**APPLICATIONS OF INFORMATICS
IN ENVIRONMENT ENGINEERING
AND MEDICINE**

Editors:

Jan Studzinski
Ludostaw Drelichowski
Olgierd Hryniewicz



**APPLICATIONS OF INFORMATICS
IN ENVIRONMENT ENGINEERING
AND MEDICINE**

Polish Academy of Sciences • Systems Research Institute

Series: SYSTEMS RESEARCH

Vol. 42

Series Editor:

Prof. Jakub Gutenbaum

Warsaw 2005

This publication was supported
by POLISH MINISTRY OF SCIENCE IN INFORMATION SOCIETY TECHNOLOGIES

This book consist of the papers describing the applications of informatics in environment and health engineering and protection. Problems presented in the papers concern quality management of the surface waters and the atmosphere, application of the mathematical modeling in environmental engineering, and development of computer systems in health and environmental protection. In several papers results of the research projects financed by the Polish Ministry of Science and Information Society Technologies are presented.

Papers Reviewers:

Prof. Ludosław Drelichowski
Prof. Olgierd Hryniewicz
Dr. Edward Michalewski
Prof. Andrzej Straszak
Dr. Jan Studzinski

Text Editor: Anna Gostynska

Copyright © Systems Research Institute of Polish Academy of Science,
Warsaw 2005

Systems Research Institute of Polish Academy of Science
Newelska 6, PL 01-447 Warsaw

Section of Scientific Information and Publications
e-mail: biblioteka@ibspan.waw.pl

ISBN 83-89475-04-9
ISSN 0208-8029

**APPLICATIONS OF INFORMATICS
IN ENVIRONMENT ENGINEERING
AND MEDICINE**

Editors:

Jan Studzinski
Ludosław Drelichowski
Olgierd Hryniewicz



PREFACE

The purpose of the present book, published by the Systems Research Institute of the Polish Academy of Sciences, is to popularize the applications of Polish and foreign informatics in environment and health engineering and protection. Runned papers, written by Polish and foreign authors, are thematically chosen from the works presented during the conference *Multiaccessible Computer Systems (Komputerowe Systemy Wielodostępne)* that has been organized by the Systems Research Institute and University of Technology and Agriculture in Bydgoszcz for several years in Ciechocinek. Originally designed as domestic conference were achievements of Polish computer science in different sectors of economy could be presented it is nowadays re-profiled into international conference with the separated session concerning application of informatics in environmental engineering. The conference itself and the present publication are supposed to be a debating forum where new ideas, achievements and products of the scientific institutions, specialistic computer companies and the end users of the informatical solutions can be confronted and information shared. In our opinion only such form of the meetings – debating and confrontational – makes possible to receive quick and favourable results what is especially important in so rapidly developing and so essential for the people area like health and environmental protection.

The present book consists of fourteen papers by the authors working for twelve research centers including seven foreign institutions. The papers are collected in three chapters concerning quality management of the surface waters and the atmosphere, application of the mathematical modeling in environmental engineering, and development of computer systems in health and environmental protection.

Chaper 1 includes five papers: two of them written by German authors: Albrecht Gnauck and Bernhard Luther from the Brandenburg Technical University of Cottbus – describe the ways of improvement of the quality of surface waters, and three by the Polish authors: Piotr Holnicki, Andrzej Kałuszko, Jan Gadomski and Zbigniew Nahorski from the Systems Research Institute – concern the problems connected with reduction of athmospheric pollution.

There are four papers in Chapter 2 written by Polish authors: Joanna and Antoni Miklewski from the University in Szczecin – regarding models of regional development; Paweł Bartoszczuk from the Systems Research Institute – about modeling the economic development taking into consideration environmental protection; and Paweł Licznar from the Agricultural University of Wrocław – regarding modeling of the influence of the atmospheric rainfall on the environment.

Chapter 3 consists of five papers, two of them are by foreign authors: Krystyna Voigt, Rainer Brueggmann and Stefan Pudenz from three research organizations of Germany – presenting decision support system to reduce environmental pollution caused by pharmaceuticals; and Pierre Gillois', Gilles Chatellier, Marie Christine Jaulent and Patrice Degoule from three organizations of France – describing a computer system supporting illness diagnosing; and three papers by Polish authors: Ludosław Drelichowski and Małgorzata Zajdel from University of Technology and Agriculture in Bydgoszcz – describing technologies of knowledge management used in environmental protection, and the state of the research and works connected with environmental engineering in Kuyavian-Pomeranian region in Poland; as well as the paper by Lucyna Bogdan, Jan Studzinski and Danuta Kaczmarska from the Systems Research Institute and the Waterworks in Rzeszow – concerning the state of the application of the computer science in the field of environmental engineering – in this case in Polish water and wastewater enterprises.

We would like to emphasize that five from the presented fourteen papers: written by Joanna and Antoni Miklewski; Jan Gadomski and Zbigniew Nahorski; Paweł Licznar; Lucyna Bogdan, Jan Studzinski and Danuta Kaczmarska – present results of the research projects financed by the Polish Ministry of Science and Information Society Technologies. This fact seems to be a good indicator of the governmental support for the research concerning the development of the computer science in environmental protection, as well as the good determinant of the organizational activity of the Polish research institutions.

*Jan Studzinski
Ludostaw Drelichowski
Olgierd Hryniewicz*

Warsaw, August 2005

**Jan Studzinski, Ludosław Drelichowski, Olgierd Hryniewicz
(Editors)**

**APPLICATIONS OF INFORMATICS IN ENVIRONMENT
ENGINEERING AND MEDICINE**

The purpose of the present publication is to popularize applications of informatics in environment and health engineering and protection. Runned papers are thematically chosen from the works presented during the conference *Multiaccessible Computer Systems (Komputerowe Systemy Wielodostępne)* that has been organized by the Systems Research Institute and University of Technology and Agriculture of Bydgoszcz for several years in Ciechocinek. Problems described in the papers concern quality management of the surface waters and the atmosphere, application of the mathematical modelling in environmental engineering, and development of computer systems in health and environmental protection. In several papers results of the research projects financed by the Polish Ministry of Science and Information Society Technologies are presented.

ISBN 83-89475-04-9

ISSN 0208-8029
