V. PESCARU
GH. BOLDUR
R. HOMESCU

International Information-Processing Summer School

Constanța 1971

The remarkable results obtained by information-processing are a proof of its importance. in the social-economical and technical-scientific life.

The International Information-Processing Systems Summer School (IIPSSS), organized under the sponsorship of UNESCO, by the Bucharest University, Grenoble University, Government Committee for the Endowment with Computing Equipment and the Automation of Data Processing, and the State Committee for Nuclear Energy, was held in Constanța (Mamaia) from 1st — 17th August 1971, in the building of the Pedagogical Institute.

This important international scientific meeting gathered representatives from Argentina, Bulgaria, Czechoslovakia, France, F.R. of Germany, India, Ireland, Italy, Norway, S.R. of Romania, USA, Hungary, who studied or held specialized lectures, covering a wide range of problems in the field of information processing.

The present epoch, characterized by a technological and scientific evolution, vastly involved in the economic and social life, is floated by a huge amount of information, that must be processed in order to serve the major interests of the various social sections. This feature determined man to use in his own interest an instrument able to help him in processing information, in solving the most important problems, as well as to use methods and procedures fit to this end.

Thus, the electronic computers were conceived and built up, new sciences as cybernetics, information theory, operational research and otheres have been created, — sciences which, from one day to another, change their structure, are improved, enrich and develop themselves, finding ever more

applicability fields. This way, the sphere where their methods get into is ever increasing.

The information processing — which brings together technical means, scientific procedures and methods of storing, recording, processing and transmitting information — appears within the contemporary human activity, as a science in full progress, involving experts in various fields, able to develop and use it.

The noteworthy advances of electronics, mathematics, technology, on the one hand, and economic and social development, on the other hand, account for the ever growing interest for information processing. Besides, this new science is equally of interest for all the specialists who develop and apply it. Thus the number of information-processing people, nearby in all the fields of activity, is considerably increasing. At present, the results obtained by the usage of electronic computers in the economic, technological-scientific and social activity are well known. From the solving of relatively simple mathematical problems, until the control of the most complex industrial processes or of the cosmic space rockets, the electronic computers and all the stock of involved scientific methods proved to be an important research instrument and an instrument of the technical-economic development of society.

The remarkable results already achieved by the information processing in all fields are marks of its importance and a testimony of the necessity of its development and application in all branches of the social-economic and technical-scientific life.

Starting from these realities of the contemporary world, the experts in economy in this country, who are receptive to all that is new and represents progress, strongly emphasize this new branch of the science — the information processing — granting it the proper weight, both in its development and in its introduction in the economic and social practice.

Our state affords an effective support to the development of this domain, by stimulating the technical and scientific co-operation with all countries, and assigning important investments for the endowment of the national economy with computing equipment at world's level.

In the same line must also be considered the organizing and carrying on of the International Information-Processing Summer School — an action that was aimed as scientific co-operation and friendship between peoples.

The organizing complexity of this Summer School made it necessary that the organizers displayed an important effort, with a view to conferring it, by its program, a high scientific level and good functioning conditions. The main credit of the scientific and administrative organization is due to the School headmasters, Acad. Prof. N. Teodorescu (Bucharest University) and prof. G. Boulaye (Grenoble University, UNESCO expert), who carried on an assiduous activity to ensure a well-balanced but concomitantly varied scientific program, with a view to approaching problems of major interest in the information processing. To this end, well-known university professors and experts in information processing, from this country and from abroad, have been invited, and they held very interesting lectures. The school organization also involved a wide working program, materialized in the carrying on of an important symposium and seminary, of panels and meetings bet-

ween participants, the providing of all participants with reproduced scientific papers, a.s.o.

In response to this remarkable organizing effort, the Summer School enjoyed the full attention and substantial support of the central, government and local bodies, with a view to ensuring a profitable carrying on for the whole school duration.

At the opening of the Summer School there took part: Com. Vasile Vîlcu — vice-president of the State Council, first-secretary of the District Committee of the Romanian Communist Party — Constanţa, com. Mircea Maliţa, minister of Education, com. Mihai Drăgănescu, permanent secretary of the Government Committee for the Endowment with Computing Equipment and the Automation of Data Processing, Prof. Augusto Forti, head of the Post-university Scientific Research Division in UNESCO, Prof. Fermin Bernasconi, Director, UNESCO Intergovernmental Information-Processing Centre, Mr. François E.M. Sautreuil, Cultural Counsellor, French Embassy, representatives and experts from UNESCO, as well as personalities of the State and local administrative bodies.

The International Information-Processing Summer School offered to the participants in lectures, panels and scientific papers, the possibility of exchanging ideas, of constructively confronting their points of view and own experiences in speciality problems in this highly topical field, of major importance in our time.

On the agenda of the School, topics of common interest were registered, involving news in the field, developing trends, new experiences, opinions and ideas; approximately 25 important themes were held under the form of papers and lectures; 27 scientific papers were presented within the symposium organized by the school; debates on various topics of general interest took place within the panel discussions organized during the above-mentioned period. Over 100 participants from this country and abroad were present at these manifestations of high scientific level.

The scientific program, which initially included courses, lectures, panel discussions and a symposium, was supplemented by a seminary, and considerably extended, on the participants demand, by the addition of a supplement of themes and scientific papers — with the object of thoroughly studying common-interest problems, that have been presented within the lectures, courses or the symposium.

By underlining this form of manifestation, materialized in the supplementings brought to the initial program, and which is an evidence of a high and competent level, we believe that this also constitutes an illustration of the profitable atmosphere which characterized the whole scientific activity during the 17 days of the International Information-Processing Summer School.

As it resulted from the school proceedings, the study of data-processing systems reached, during the last 20 years, an impressive development; the very notion of information system covers the two essential aspects: electronic computers, and their operating system. An organized study of information systems must approach these two aspects, with a view to presenting, not only a monograph, but also a competent synthesis, profitable for the future, both from the theoretical and practical, applicative viewpoint.

Excepting the presentation of the lectures on teleprocessing and on high-capacity computer systems, which had a weight inferior to the one foreseen within the program, we consider that the problems concerning operation, structure and utilization of information systems were successfully approached, as concerns both the present lecturers and the whole mass of participants.

We consider as a quality the fact that amateurs or ocasional users of information systems did not attend to this important international scientific meeting, the participants being specialists in this field: university professors, managers of computation centres, scientific research workers in the field of information processing, mathematicians, economists, graduated engineers etc., all people experienced in this activity domain.

The initial scientific program, which was supplemented, on request, with panels and discussions on various topics, outlined the dynamic and competent character of the school.

As concerns the fields of information processing, a review of the themes approached within courses and lectures points out a multitude of aspects, ranging from the evolution of modern technologies in building up automatic data-processing systems, to the structure and design of complex information-processing systems.

Prof. Guy Boulaye (Grenoble University, UNESCO expert) held lectures in which he approached problems referring to the internal structure of electronic computers and the ways of achieving microprogramming, particularly emphasizing the connection among circuits, micro-instructions and micro-controls, the present-day trends of carrying out microprogramming by using performing logical circuits.

Acad. Prof. Nicolae Teodorescu's lectures connected with the cybernetic theory of information systems (carried on also within the Symposium) were remarkable for their particular importance. These lectures approached modern conceptions of organization and scientific management of enterprises, conceptions on information transmission, on information decision making processes, and on the psycho-social relations involved.

A particular interest was aroused also by the lectures held by Prof. Daniel Teichroew (Michigan University — USA), concerning methods, techniques and principles of information systems, as considered from the viewpoint of their carrying out, in connection with the followed-up objectives. Problems connected with the requirements of information systems, as regards their design and implementation, have been approached. Particular emphasis has been laid on the selection of the most adequate methods and variations of information systems, to be implemented. A critical analysis of the present-day methods, used in designing information systems, was also made, and the shortcomings of some methods were pointed out, i.e. of such concerning the study and research of information systems, the relations between users and the information-processing systems, the possibility of subsequent modifications regarding organizational alterations and long-term development of the objective attended by the information system, selection of programming languages and processing equipment, a.s.o. There were presented criteria of establishing a language to describe the requirements the information systems must meet; since such a language has to be adap-

ted to the future requirements of the developments and future advances of data-processing, the opinions were in favour of a simple structured language, close to the spoken language, that could be used in the management activity, without the agency of analysts. Such a language can be used in determining requirements of information systems, their testing, and in standardizing and automatizing analysis and design of information systems. Means of organizing the analysis with a view to designing modern information systems were also described.

In connection to these, problems concerning the part played by information systems in the management activity constituted the topic of some lectures, dealing with both theoretical and practical aspects.

To this end, problems related to the connection between information systems and planning were debated upon (Prof. Benjamin Barg, head of the New Technology Department in the UNO Secretariate), particularly stressing the necessity of selecting information-processing and decision-making activities at various levels of management and decision making — a section which would allow operativity in information, accuracy, concision and completeness of information. On this line, practical methods of carrying out these requirements were described, strictly depending on the previsions of future developments of the managed objectives.

Present-day currents in the development of management theory and practice have been presented, as well as existing relations between management and technology changes, with applications in industry and state management, and problems connected to the development of the management science with the help of electronic computers.

Going over to the field of social and economic utilization of information systems, Professors Fermin Bernasconi and Augusto Forti presented themes concerning the relation between information processing, economic development, and state management. In the submitted reports, problems have been approached, connected to the standardization of terminology in the field of information processing, problems linked with the utilization of information systems in the state management, in economic and social development, as well as problems connected to the formation of staff in this field, and to the organization of information systems.

A series of lectures held by Prof. Charles H. Warlick (Tennessee University, USA) have been devoted to the design, implementation and exploitation of complex computing systems and of computer networks in the universitary education system, laying the stress upon the mode of organization of computation centres devoted to this purpose, upon criteria of selecting processing equipment (particularly, time-sharing processing systems and their terminal equipment), upon criteria and methods of loading computers with programs. Problems were also debated upon, which are connected to the operation systems, the structure and design of files and programming languages, used for time-sharing networks and data-processing systems.

In another series of lectures, Prof. Brian Girling (City University, London) presented problems specific to the use and achieving technique of hybrid computer systems in higher education; the ways of developing problems by the simulation technique on digital and on analog computers, as well as languages used when simulating on hybrid system, have been discussed.

The use of electronic computers in the selfdesign of their own parts or component circuits, also formed the object of a series of lectures held by Dr. Ing. M. Pitke (Tata Institute, Bombay, India). The automatic modelling and testing of designed devices, the specification of drawings for devices and components, the selection of components to be connected in order to achieve a circuit, the evaluation of performances of the designed system, the determination of the optimal circuit group to be integrated, as well as the detection of possible faults in the designed circuitry system — here are some of the multiple problems of the methodology of selfdesign, by electronic computers, of their components and structures.

Lectures held by the speciality teaching staff and scientific research workers of the Bucharest University have had an important weight within the Summer School's program.

Thus, in addition to the above-mentioned lectures concerning the cybernetic theory of information systems (Acad. N. Teodorescu), an important part was also played by the lectures held by lecturer Dr. I. Văduva (Faculty of Mathematics-Mecanics), on basic problems in the simulation theory, in which the implications of the Monte-Carlo analysis and the theory of games within the digital simulation were treated, and the elements of a simulation model, the classification of simulation models, as well as the utilization of simulation languages were described. A number of teaching hours were devoted to the generation, by means of the electronic computer, of random variables, random vectors, a.s.o.

The problems of the connections between algebraic theory and the probabilistic theory of the error-correcting codes (lecturer Silviu Guiașu — Bucharest University) made the object of some lessons, which presented a particular interest, both from the theoretical and the practical viewpoints (correcting errors occurring during automatic data processing).

Some exposings, as were those connected with the applying of transduction grammars to compilers writing (mathematician Mircea Chirică, Bucharest University), with the mathematical models of programming language, with the basic problems in the simulation theory (lecturer Dr. I. Văduva — Bucharest University), sufficiently call attention to the problems now arising in the software field.

The multitude of themes debated upon under the form of courses and lectures, as well as the authors who exposed them, are also presented in Annex 1.

Operational research and digital analysis, information theory, codes theory, theory of probability and mathematical statistics attending information processing, as well as their applications within the economic and social activity, set up the topics of a symposium, integrated within the Summer School program under the title "Information Processing and Operational Research". It is noteworthy that this Symposium occupied the central part in the Summer School Program.

The organizing of this important Symposium, under the leadership of Acad. N. Teodorescu, was a particular achievement, as regards both the presentation of particularly important lectures and courses, and the including in the agenda of a session of scientific reports, of a seminary (regarding the "schools map"), and of some panel discussions.

A series of themes of particular interest stood out in the lectures. Thus the theme concerning the cybernetic theory of information systems (Acad. N. Teodorescu) was kept on within the Symposium, where it arouse the vivid interest of participants.

There have been also treated: the problem of management theory and practice (B. Barg, UNO General Secretariate) which we have already, mentioned, the research problem of rationalizing the "schools map" (J. Hallak and J. McCabe — professors at the International Education Planning Institute — UNESCO), within which the experience effected upon Ireland was pointed out; a simulation model in education planning (Lecturer I. Văduva — Bucharest University) was also presented.

Within the same hours of courses and lectures of the Symposium, Prof. E. Pichat (France) expounded the theme referring to the shortest and longest ways in a graph, with theoretical and practical applications, while lecturer Silviu Guiaşu (Bucharest-University) presented the problem of the error-correcting codes, in connection with the algebraic theory and the probabilistic theory.

A manifestation within the Symposium, particularly interesting both from the scientific and practical point of view, has been the seminary directed by Acad. Prof. N. Teodorescu and Prof. J. Hallak (UNESCO) upon the "schools map" draft. Discussions that took place upon the drawing-up methodology of this "schools map" draft, by the creation of an optimal system for dimensioning and locating the various school categories.

Within this important seminary was stated the real possibility of co-operation between the specialists' teams in the Faculty of Mathematics-Mechanics (Bucharest University), experienced in working out prognosis models of education, those of the Computation Centre of the Economic Cybernetics Department in the Academy of Economic Studies, experienced in macroeconomic modelling, and the specialists of the Ministry of Education, with a view to studying and working out some planning models of education.

This problem, of national interest, concerning the "schools map" will represent in the future an international co-operation theme (on the UNESCO line), having a particular importance.

Scientific reports took up an important weight within the Symposium.

Remarkable by their character of effective application in economy, were a series of reports made by research workers in the Computation Centre of Economic Cybernetics Department in the Academy of Economic Studies, concerning algorithm systems and programs for the operative programming of production in the chemical factories, algorithm systems and programs for optimizing supplies and transports of the main petroleum products, algorithm systems and programs for bi-dimensional cutting-stock problems, as applied in the metallurgical industry, timber industry, paper industry, a.s.o., algorithm systems and programs for filing, retrieval and restoring information, with applications in the scientific documentation, algorithm systems ans programs based upon digital simulation application, in solving PERT-type problems with resources, and others.

Through their character of concrete applicability in the economic activity, but mainly through the obtained results, these reports have been dis-

cussed by an important number of participants, raising a vivid interest and determining the participants to come into contact with the researchers who worked on these problems.

Thus, debates took place, concerning the economic efficiency of applying these concrete results; it ensued from the discussions that it would be possible to generalize the results in all the economic fields of activity, with the same profile, or with a similar one.

The other reports, delivered for the most by young researchers in the Faculty of Mathematics-Mechanics of the Bucharest University, distinguished themselves by their scientific level; they approached problems in the field of operational research and its connection with the information processing. Theoretical papers have been thus presented, concerning questionnaire theory, integer programming, successive comparison method in the decision theory, S.E.P.-type algorithms, problems of recognising diagnosis in renal diseases, a.s.o.

These works attested, by their theoretical character with multiple applicative possibilities, the ever growing interest towards this new domain — the operational research.

The riches of the themes and the value of the papers (their titles are given in Annex 2) determined a wide participation, as well as interesting discussions.

The Symposium — as an important scientific manifestation within the School — emphasized, on the one hand, the part played by the operational research in applying information processing, and, on the other hand, the high level of the Romanian school of operational research.

Concluding, we can say that, as a whole, the Symposium "Information Processing and Operational Research" was a high-level scientific manifestation, an outstanding achievement, rich in important, topical themes, which were of concrete applicative interest, as well as in profitable discussions on the presented papers.

The panels — part and parcel of the Summer School program — figuring in the initial agenda and extended thereafter, upon participants' and lecturers' request, also evinced the rich and interesting information-processing problems; they illustrated the spontaneous activity within the School and the participants' competence level. Uniting together famous experts from this country and abroad, the panels intensively discussed themes concerning time-sharing computer systems, organization and management of computation centres, training of personnel in information-processing, and problems connected with electronic computer hardware.

The panel on the utilization of time-sharing computers, lead by C. Warlick (USA), took into discussion problems connected to the economic efficiency of using such computer systems, problems connected to their design and implementation in current practice, underling the necessity of logical designing, as initial stage, simulating such systems, as intermediate stage, and the adapting to subsequent modifications of a such designed system, as final stage. There have also been discussions on the main technical and operative characteristics used in time-sharing systems; the necessary equipment systems, for this type of data-processing systems with a view to using them in concrete cases, have also been described. A particular weight was

assigned to the problem of designing and implementing time-sharing computer networks, debating upon requirements and operating principles of these networks.

As concers the panel connected with the training of personnel in information-processing, led by Prof. Ch. Coatmélec (France) and Prof. Eng. Rogojanu (Polytechnical Institute — Timişoara), problems were approached there concerning the training of high-graduated specialists: it was proposed that their training takes place in higher economic schools, higher technical schools, and in universities; it was also stressed that the impetuous development of information processing requires the introduction of special post-graduating courses, for the majority of graduates. These courses must deal with problems of utilization, design and carrying out of automatic data-processing systems, as well as with problems concerning programming languages. The analytic educational programs intended to this aim have also been discussed. The necessity of developing the doctorship-degree education in the field of information processing as an indispensable condition for covering the requirements of personnel training in the higher education, resulted from the discussion held. An important problem concerned the necessity of connecting higher education (training of personnel in information processing), with the actual requirements of economy. The problem of post-graduating courses for training in information processing the specialists in various fields of economy, has been also approached.

The panel led by lecturer Dr. I. Văduva (Bucharest University), with the topic "management of computation centres" brought into discussion the ways of achieving efficiency in automatic data processing by a rational economic policy of the computing centres, by adequate forms of relations between computation centres and users; the stress was laid upon the shortening of information-system designing and implementing time period. Research-development activities within computation centres made up the topic of other discussions held within this panel. In the same line, problems were discussed, concerning operating systems, efficient multi-programming systems, methodologies of programming and of drawing up programs in various languages, as well as methodologies of analysis, design and implementation of information systems.

The panel concerning hardware, led by Dr. Eng. M. Pitke (India), approached a series of aspects connected with direct access storages, and the great trend of using them in the future. Designing and carrying out of circuitry and structural components of electronic computers were the topic of some interesting discussions, especially concerning utilization of computers in self-designing them. There have also been taken into discussions aspects connected to the establishing system configuration of computers compatible between themselves.

The organized panels proved to be particularly useful, they approached a wide range of problems, favourably completing the themes held during courses and lectures, with various aspects, theoretical and practical, as well as applicative, derived from the personal or collective experience of people attending these panels.

Sponsored by the Summer School, the courses, lectures, the symposium and panels were carried on in a perfect spirit of co-operation and friendship, and they approached topical themes, of general interest, covering to a great extent the vast field of information processing, and thoroughly dealing with those themes which were of great interest. The multivarious program offered the participants both the attending of specialty courses and the possibility of communicating scientific papers, which represented personal or collective experiences.

With a view to ensuring a perfect harmony between effort and relaxation, and as a consequence of an intensive program, the organizing committee of the School also drew up a pleasant cultural, sports and touring program, including recreative and pleasant trips, attending of performances, cocktails, a.s.o.

From the beginning of the courses up to the ending of the Summer School, the high-level scientific program, as well as the particularly attracting and captivating work atmosphere — which resulted from an elaborate organizing activity — demonstrated that such a framework is favourable to exchanges of ideas and conceptions, to an exchange of experience in a topical and highly important field, as information processing.

This scrientific type of manifestation proved to be particularly useful and profitable, and it was a testimony of the actual possibilities of introducing in the economic, social and scientific practice this important science, destined to contribute to the progress of mankind, to the rising of social life on a high level.

ANNEX 1

BENJAMIN BARG (Professor, head of the New Technology Departament in the UNO General Secretariate): *"Recent Developments in the Management Theory and Practice"*.

GUY BOULAYE (Professor, Grenoble University, France, UNESCO, expert): *"Trends in Computers' Structure"* and *"Influence of Microprogramming"*

MIRCEA CHIRICA (Mathematician, Computation Centre of the Bucharest University): *"Application of Transduction Grammars to Compilers Writing"*

CHRISTIAN COATMELEC (UNESCO expert, Professor, Rennes University, head of the Mathematics and Information-Processing Departament, National Institute of Applied Sciences, Rennes, France): *"Study of some Fundamental Notions in Digital Analysis"*.

MICHEL CORDELLE (Professor, Director of the Electronics and Information Technology Laboratory in the Nuclear Studies Centre, Grenoble, France): *"Role of Technology in Designing Computers"*.

FERMIN BERNASCONI (Professor, Director of the UNESCO Inter-Governmental Information-Processing Centre, Rome) and

AUGUSTO FORTI (Professor, head of the UNESCO Post-universitary Scientific Research Division): *"Information-Processing, Economic Development and State Management"*.

SILVIU GUIASU (Lecturer, Bucharest University): *"Connections between Algebraic Theory and Probabilistic Theory of Error-correcting Codes"*

J. HALLAK, J. McCABE (Professors, UNESCO International Education Planing Institute): *"Research on Rationalizing Primary and Secondary School Map : Pilot Study on Ireland"*

E. PICHAT (Professor, Institute of Enterprise's Information Processing, ONAM, France): *"Graph Theory and Algebra Applied in Information Processing"* and *"Problem of Shortest and Longest Ways in a Graph"*

MADHN PITKE (Dr. Eng., Tata Institute of Fundamental Research, Bombay, India): *"Methodology of Computer-Aided Design"*, *"Applications of Computer-Aided Design"*, *"Terminals for Computer-Aided Design"*

B. I. PENKOV and BL. SENDOV (Professors, Sofia University, Bulgaria): *"Hausdorff's Metric and its Applications"*

DANIEL TEICHROEW (Professor, Michigan University, USA): *"General Review of Languages with a view of Establishing Requirements for Information Systems"*, *"Data-Processing and Management Systems"*, *"Higher Education Programs for Training Personnel in Information Processing"*

NICOLAE TEODORESCU (Acad. Professor, Faculty of Mathematics-Mecanics of the Bucharest University, Director of the Computation Centre of the Bucharest University): *"Cybernetic Theory of Information-Processing Systems"*.

ION VĂDUVA (Lecturer, Deputy Scientific Manager of the Computation Centre of the Bucharest University): *"Fundamental Problems in Systems Simulation"*, *"Computer Generation of Random Variables"*, *"A Computer Simulation Model in Education Planning"*

CHARLES H. WARLICK (Professor, Manager of the Computation Centre of the Texas University, Austin, USA): *"The Computer Network"*

BRIAN GIRLING (Professor, City University, London, UNESCO expert): *"Hybrid Computing Installations"*.

ANNEX 2

Symposium: "Information Processing and Operational Research"

Ist Section

V. BARDAN: "Digital Filtering"

MIRCEA I. MANOLESCU: "Applications of Taxonomy and Scientific Diagnosis in Sociology and Law Sciences"

CRISTINA ZAMFIRESCU: "On the Questionnaires Theory"

M. POPA: "Integer Programming"

V. PREDA: "On the Method of Successive Comparison in the Decision Theory"

V. MASGRAS: "Application of the Graph Theory in the Theory of Numbers"

C. DINESCU: "Connex Hardware and its Essential Elements"

I. TOMESCU: "Consideration on the Complexity of S.E.P.-type Algorithms"

MONICA BAD: "An Application of Establishing Diagnosis in Renal Diseases"

N. POPOVICIU: "Some Notes on Solving Non-linear Programming Problems"

MARIA VOICULESCU: "On the Bayesian Prediction"

N. MOLDOVEANU: "On the Prediction of Stationary Stochastic Processes"

L. SIMION: "A Solution of Bivalent Linear Programming Problems Obtained by the Conditional Sequences Method"

IInd Section

R. De MORI (Dr. Eng., Assistant Lecturer, Torino Polytechnical Institute, Italy) "Some Results on Language Processing by Computer"

GH. CIOBANU, I. VĂDUVA: "Application of Digital Simulation in Solving a PERT Problem with Resources"

I. VELICAN, V. PESCARU, GH. WEISZ: "Production Control in an Integrated Information System".

V. PESCARU, D. DUTA: "An Optimization System of Supplies and Transport of the Main Petroleum Products"

M. AVRAM: "A Tree-like Model for Selecting Optimal Solutions for Industry Halls by the S.E.P. Method".

I. ŞTEFĂNESCU: "A Problem of Multidimensional Selection with a Great Number of Versions"

R. EFTIMIE: "On the Problems of Data Bases and Data Banks"

GH. BOLDUR: "On logical Fundaments of Economic Decision-making Processes"

EVA ALTMAN (Assistant Lecturer, Information-Processing College, Bonn, F.R. of Germany): "The Planning Process in Public Administration-System Analysis and Design"

I. TRIFU, V. PESCARU, L. MIZA, M. IONESCU-BUJOR; V. DUMITRESCU: "Problems Concerning the Creation of an Automatical System of Storage, Retrieval and Spreading of Information, for a Documentation Centre"

D. DUTA, CS. FABIAN, GH. WEISZ: "CROCODILE — a Program System for Bidimensional Cutting-Stock Problems"

M. STOICA, H. CHELARU, D. CHIRA: "The Complex Problem of Production Programming and its Applications in the Chemical Industry"

J. AURIAN, N. GHEORGHIU: "Production Management Systems in the ADC/MP/TR-type Building"

M. DUMA: "Some Aspects of the Accuracy of Input Data for an Optimization Program of Power Distribution in a Power System".

L'ECOLE INTERNATIONALE D'ETE SUR LES SYSTEMES INFORMATIONNELS CONSTANŢA 1971

Le présent article passe en revue l'activité de l'Ecole internationale d'été sur les systèmes informationnels, organisée sous les auspices de l'UNESCO et qui a eu lieu à Constanţa (Mamaia) — Roumanie, dans l'intervalle 1—17 août 1971.

On présente les problèmes qui ont fait l'objet des conférences, cours et séminaires, ainsi que l'ensemble — très varié — des thèmes d'un prestigieux symposium "L'informatique et la recherche opérationnelle", part intégrante du riche programme scientifique de L'Ecole d'été.

Cet article, outre, qu'il passe en revue les conférences et les cours les plus importants, illustre l'intérêt tout particulier accordé par les specialistes participants à l'application des moyens et des méthodes les plus modernes de calcul automatique à l'activité sociale-économique et technique-scientifique.

МЕЖДУНАРОДНАЯ ЛЕТНЯЯ ШКОЛА ИНФОРМАТИКИ—КОНСТАНЦА, 1971 г.

Настоящая статья представляет собой обзор работы Международной летней школы по информационным системам (L'ÉCOLE INTERNATIONALE D'ÉTÉ SUR LES SYSTÈMES INFORMATIONNELS), организованной под руководством ЮНЕСКО в Румынии — Констанца (Мамайя) с 1 по 17 августа 1971 г.

Представлены проблемы, явившиеся предметом лекций, курсов и семинаров, а также разнообразная тематика важного симпозиума „Информатика и операционные исследования" — неотъемлемой части обширной научной программы Международной летней школы.

Эта статья, помимо обзора важнейших лекций и курсов, выявляет особый интерес, проявляемый специалистами-участниками по отношению к применению наиболее современных средств и методов автоматического расчета в социально-экономической и научно-технической деятельности.