From your Editors

Dear Readers!

This Newsletter is a product of our editorial collaboration. We hope that it will appeal to you. We are trying to make our Newsletter better, faster and cheaper. First of all, we have attempted to cut costs by converting to desktop editing and single-color printing. Furthermore, we have tried to make this publication more up-to-date by drastically reducing the interval between the editorial deadline and the time the Newsletter lands on your desk. Overseas mailing delays do still present a considerable problem, but we are working on it!

You will also find a new face on the editorial board: Gerhard Chroust, the new secretary/treasurer of the IFSR, will take primary responsibility for the Newsletter, together with our experienced editor Stephen Sokoloff. Together we hope to provide a Newsletter which deserves the prefix 'news' and which servers your interests. In each Newsletter we will provide information on past and future conferences and on relevant books on the market . We will report on the IFSR and plan to present some of its members. One section will be devoted to some new trend in our field.

Since a Newsletter should not be a one-way street we invite you to provide the necessary input to make it a living connenction between the members. If you have suggestions etc. please contact us.
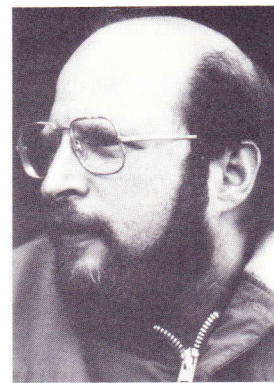
Hoping for a good cooperation,

Gerhard Chroust, Stephen Sokoloff

Systemtechnik und Automation
Kepler University Linz, 4040 Linz, AUSTRIA
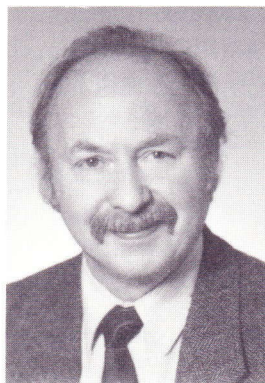
Gerhard Chroust   Stephen Sokoloff

The Future of CAST
"T" for "Technology"

EUROCAST 1993 is a memory now, and CAST-gurus are already busily forging bold new plans for their next workshops and for the future of their discipline. They will increasingly emphasize the technological applications of *computer aided systems theory* (CAST) not only in their traditional engineering domain but also in such "soft" fields as peace research, city planning and even driver training.

That will necessitate the development of new models. If, however, these are merely verbal or mathematical, "nobody will take the time to try them out", maintains Franz Pichler, professor of systems sciences at the University of Linz. The probability of their acceptance will be considerably enhanced if they are made available in the form of software which is ready for immediate implementation.

EUROCAST 93 took place 21-26, February 1993 in Las Palmas (Gran Canaria, Spain). About 80 participants from 13 countries (65 of them lecturers) attended the workshop. The following sessions were held: systems theory and applications, symposium on CAST and CAD,

stochastic models and complex systems, modelling and environments, vision and machine intelligence.

A detailed interview of Franz Pichler is planned for the next issue of the IFSR-Newsletter. He will explain what CAST is what its potentials are and what hurdles it still has to surmount.

Reported by: Witold Jacak, Christoph Schaffer, Franz Pichler, written by Stephen Sokoloff.

CBSE Task Force Meeting London

(London, Dec 14-17, 1992)

The design and construction of computer based systems, i.e. of systems in which the computer is an essential and characterizing element of the whole design, is nowadays recognized as an important subarea of systems engineering. At this meeting, approx. 20 people from all over the world sketched the current state of this sub-discipline. One exercise was to apply different existing design notations/methods to a common problem - the choice was the simplified control of an airport.This served to elucidate many of the intrinsic problems: real-time response, fail-soft behaviour, asynchronicity and the existence of ill-defined requirements and assumptions. Besides, there were intensive technical discussions, and an initiative to establish a (new) IEEE Technical Committee on CBSE was approved.

For further details contact:
Dr. Johan Z. Lavi
Israel Aircraft Industries, Ben Gurion Airport
Tel Aviv, Israel
tel: 972-3-935-3716, fax: -8516

NEW TRENDS

Designing an Effective System of Environmental Laws

a few Basic Considerations

Prof. Dr. Herbert Wegscheider*) and Dr. Stephen Sokoloff
)Institute of Criminal Law, University of Linz

Nowadays we are becoming increasingly aware of the threat of environmental disaster and many authorities concede that it will be necessary for us to move rapidly in the direction of sustainable economic and social development ("qualitative instead of quantitative growth"), as defined by the Brundtland-Report. Certainly, however, this kind of reorientation cannot be achieved solely through appeals to reason or morals; a system of effective legal constraints will have to be imposed.

What sort of concrete measures might this entail? Unfortunately, environmental laws generally do not fulfill their intended functions. By determining the reasons for past failures we might, however, be able to avoid repeating them. Besides, in recent decades a few models have emerged that are workable and worthy of imitation.

Priority for Economic Regulation

We can be certain that environmental destruction will continue as long as some people profit from it. Appropriate taxes and fees (e.g. on fossil fuels) would discourage both pollution and the excessive utilization of non-renewable natural resources. The funds they generated could be used to promote the development of solar and other environmentally compatible technologies.

One promising system of economic control which is obtaining increasing popularity in the United States involves emissions credits. For a certain fee the state grants industries pollution rights. These are issued until a predetermined limit is attained. They can be resold; only supply and demand dictate their price. This approach is not applicable to all situations, however. It works best for the regulation of a small number of large polluters emitting toxins into a single local medium such as a lake or the air around an industrial center.

Legal Measures

Of course, economic controls can never completely replace classical laws; after all, new plants have to be approved, poisonous products must be banned and it is necessary to punish violations. One common complaint ·is that environmental regulations are often hard to find. Frequently they consist of clauses and paragraphs inserted into laws whose content is primarily non-environmental. A demand has arisen for their codification, and Switzerland has already taken some steps in this direction.

As far as the environment is concerned, **administrative law** is by far the most important legal field. It includes, for example, the innumerable and often confusing norms for routine plant operations and approval procedures. Environmentalists have good reasons to complain that many of these regulations exist only on paper. Violations are rampant, since surveillance is generally inadequate. Separate, well-equipped and adequately-staffed controlling authorities, preferably ones independant of the regulative bureaucracies, could remedy this situation. They should be authorized to measure industrial emissions at the source (e.g. the factory smokestack). It would be better to prohibit all large-scale emissions and issue only individual exceptions. Unfortunately, governments usually resort to the reverse procedure; they allow all pollution that is not explicitly proscribed. Flexible emissions limits is another demand; these should be reduced whenever new, more efficient anti-pollution technology becomes available. And finally, conservation groups and other concerned parties must have the right to participate in environmental administrative procedures.

Criminal law has been designed to punish the most serious offenders, but in environmental cases the "big fish" usually go free. One reason is the priority given to administrative regulations. Irregardless of the damage resulting from his plant operations, a factory owner, for example, is in most cases acquitted of criminal charges. Only when approved procedures such as emissions limits have been violated can he be convicted. We must remember that usually-safe norms may in exceptional situations (such as inversions of atmospheric layers) prove hazardous. Therefore plant owners should, when necessary, be required to take precautionary measures such as reducing emissions - just as automobile drivers have to watch out for pedestrians, even for those crossing the street on "red". The current practice amounts to a favoring of profit interests over environmental protection and public safety.
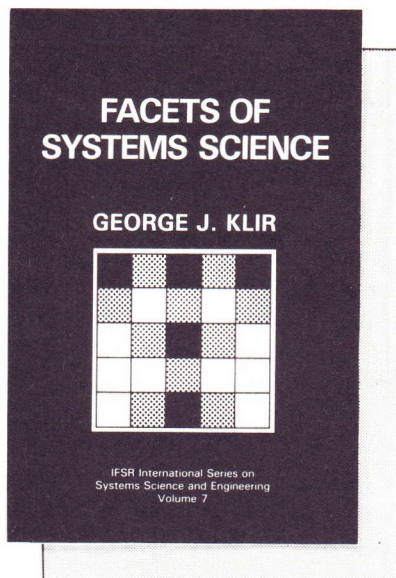
Environmental cases often present great difficulties for judges and prosecuting attornys. These officials are neither engineers nor chemists and yet they may have to decide under which conditions a certain technical procedure is safe or what concentrations of various organic compounds are tolerable in drinking water. Of course they can rely upon expert opinions, but these are often confusing and contradictory. They should be given better training in legally relevant aspects of the natural sciences.

With the current constraints which are placed on it, environmental **civil law** is merely useful for the protection of property rights. It could however, be converted into a more incisive anti-pollution instrument. One of its alluring features is the use it makes of "controllers" who are not paid officials but citizens acting without remuneration, guarding personal interests. They are, however, currently in a poor position to sue for emissions reductions - and not just compensation for damages. When the accusation is plausible, we feel that it is justifiable to compel the enterprise, in accordance with current Japanese practice, to assume the burden of proving its innocence. After all, every factory keeps a record of its operations, but plant outsiders are often hard-pressed to demonstrate the origin of a toxin; compounds don't have any labels on them. Finally, the law should permit environmental organizations and similar groups - and not just property owners with damage claims - to sue polluters in civil courts.

We have attempted to describe some of the imposing array of legal and economic instruments which environmentalists now have at their disposal. Of course these methods have to be improved upon and more effectively employed. Ultimately it will be necessary to determine by trial and error what kind of a comprehensive multidimensional approach is best suited for bringing environmental pollution under control.

Prof. Wegscheider is a specialist on environmental criminal law. Together with Dr. Sokoloff he has written a popular book on Austrian environmental problems and the laws designed to ameliorate them: Recht auf Umwelt, Orac Verlag 1991, Vienna, AS 198,--.

News from the Bookmarket

FACETS OF SYSTEMS SCIENCE

GEORGE J. KLIR

IFSR International Series on
Systems Science and Engineering
Volume 7

Facets of Systems Science
by George J. Klir

This textbook offers a broad introductory coverage of the growing field of systems science, including its historical roots, relationship with other areas of human affairs, current status and probable role in the future. Some of the topics which are covered: what is systems science? systems movement, conceptual framework, methodology, goal-oriented systems, systems knowledge, complexity, simplification strategies, systems metamethodology, systems science in retrospect and prospect. The book includes reprints of 35 classical papers that reinforce the elucidated concepts. It is written in a non-technical format with a minimal use of mathematics, and is intended for the advanced undergraduate or beginning graduate student.
Plenum Publishing Co, New York, 1991 (680 p)
Volume 7 in the IFSR International Series on
Systems Science and Engineering.

Price: $79,50 (US, Canada), $95.40 (elsewhere)
Phone orders: 212-620-8047
FAX orders and inquiries: 212-807-1047

Systems Engineering

Principles and Practice of Computer-based Systems Engineering.
by B. Thome (ed.)

This book is an outflow of the ESPRIT project 'ATMOSPHERE' and discusses most aspects of developing computer based systems: definition, scope and concepts of computer based systems engineering, system development activities, life-cycle, configuration and project-management, quality, performance, existing methods and steps toward a formal theory.

John Wiley & Sons, Chichester, New York, 1993
ISBN 0-471-93552-2

Relative Information

Theories and Applications
by G. Jumarie
University of Quebec, Montreal, Que.

There are many open problems related to Shannon's information theory. For instance, it has long been recognized that the theory does not take account of the subjectivity of the observer, but all previous attempts to deal with this remained at a rather qualitative level. Another problem is the apparent discrepancy between discrete and continuous entropy. A task of paramount importance is to define the Shannon entropy of a stochastic trajectory and of a deterministic function. This book provides thorough answers to these questions by suitably modifying Shannon theory. It presents a quantitative model of subjective information, a unifed approach to discrete and continuous entropy, a theory of information for stochastic functions and a model of Shannon's entropy of deterministic maps, which is quite different from Kolmogorov's entropy.

Springer Series in Synergetics, 1990
Ed.: H. Haken, Vol.47,. approx. 280 pp.1fig.
hardcover DM 148,-- (ca. $100,--)
ISBN 3-540-5190-X

New officers for IFSR

In its board meeting of April 1993 the IFSR elected the following officers:

President:	Prof. Dr. G. de Zeeeuw
Vice-President:	Prof. Dr. J.D.R. de Raadt
Secretary-Treasurer:	Prof. Dr. G. Chroust
Board:	Prof. Dr. R. Trappl,
	Harold Nelson,
	Prof. Dr. G. Broekstra

There are currently 3 full members and 5 applications to change over to full membership.

From the new Treasurer/Secretary

Dear Members of the IFSR!

I would like to welcome you to the IFSR in my capacity as the new treasurer/secretary. Some of you have met me at the EMCSR92 in Vienna. For those of you who do not know me; since Jan. 1992 I have been the new professor for Systems Engineering and Automation at the University Linz. I am in the same institute as Franz Pichler, our previous secretary/treasurer.

Before coming to Linz, I worked at the IBM Development Laboratory in Vienna. There I was concerned with Software Engineering Environments (IPSEs) for the last 8 years.

I hold a 'Diplom-Ingenieur' (approx. Master of Science) in Electrotechnics and a PhD. in Computer Science from the Technical University Vienna. I also have a Master of Science in Computer Science from the University of Philadelphia.

My main interest is the theoretical and practical side of the development of large socio/technical systems. One focus is development processes and their support ('interpretation') by computers. At the moment we are working with software systems (i.e. CBSE - Computer Based System Engineering) and Flexible Manufacturing.

My goal is to increase the amount and the intensity of the IFSR's activities. I therefore invite you to take an active part in the IFSR by providing me with news, ideas and actions to be followed. I hope that we will be able to make the IFSR worthwhile to work for and remain
yours sincerely

Gerhard Chroust

New members:

IFSR welcomes the following new members

Learned Soc. of Praxiology
Anna Lewicka-Strzalecka, Ph.D (Treasurer)
Nowy Swiat 72
PL-00-330 WARSAW, Poland
Technology Transfer Center
Dr. M.N.B. Ayiku
P.O.Box M-12
Accra, Ghana
International Systems Institute
25781 Morse Drive
Carmel, CA 93923, USA
Tel.: 001(408) 625-3178
FAX: 001(408) 625-3178
London Cybernetics Society
c/o School of Architecture
Prof. R. Glanville
King Henry Building
King Henry I Street
Portsmouth P01 2DY, England

List of Members:

AFCET - College de Systemique de l'AFCET, France
American Society for Cybernetics, USA
Asociacion Argentina de Teoria General de Sistemas y Cibernetica, Argentina
Asociacion Mexicana de Sistemas y Cibernetica, a.c., Mexico
Gesellschaft für Wirtschafts- und Sozialkybernetik eV (GWS), Germany
Greek Systems Society, Greece
Instituto Mexicano de Sistemas, Mexico
Int. Society for the Systems Sciences, USA
International Systems Institute, USA
John v. Neumann Society for Computing Sciences, Hungary
London Cybernetics Society, United Kingdom
Österr. Studiengesellschaft für Kybernetik (ÖSGK), Austria
Polski Towarzystwo Cybernetyczne (Polish Cybernetical Soc.), Poland
Sociedad Espanola de Sistemas Generales, Spain
SOGESCI - B.V.W.B., Belgium
Systemgroep Nederland, The Netherlands
Technology Transfer Center, Ghana
The Cybernetics Society, United Kingdom
The Learned Society of Praxiology, Poland
The Society of Management Science and Applied Cybernetics, India
United Kingdom Systems Society, United Kingdom.

Conference Announcements

For contact address, etc. see Calendar of Events.

C.E.S. 2: 2°Congrès Européen de Systémique

(2nd European Congress on Systems Science)
Oct.5- 8, 1993, Prague
The Congress aims at providing the Systems Science experts, in the framework of their scientific traditions, with the opportunity to compare their approaches.

5th Annual Conf. on Comprehensive Systems Design of Education

Monterey, Calif., Nov. 14 to 19, 1993.
The objective of the International Systems Institute, which is organzing this conference, is to design "just" systems of learning and human development for future generations.
Upon arrival "themes-focused" research groups will be organized. After formulating objectives, working methods and rules of operation, they will spend the next four days in intensive and structured conversation on their themes with progress reports and general discussion in the evenings.

In preparation for the conference, participants should write a 2-3 page "idea-paper" on their chosen themes and on the expected outcome. Possible conference topics: processes and products of design, developing a design culture in education and society, ethics of design, etc.

EUROMICRO '93 ('Open Systems')

Barcelona, Spain,Sept. 6 to 9, 1993
All fields of microprocessor-controlled systems and relevant aspects of Software Engineering, System Design, Communication and LAN, VLSI-Design and Parallel Processing will be dealt with in 94 papers.
Keynote speeches, one of them by Lofti Zadeh (the father of fuzzy logic), will put the topics into a broader perspective.

12th EMCSR 1994

(Vienna, April 5-8, 1994)
The 12th European Meeting on Cybernetics and Systems Research, organized by the ÖSGK, will again provide an opportunity for scientists to exchange ideas. Planned sessions:
- General Systems Methodology
- Advances in Mathematical Systems Theory
- Fuzzy Sets, Approximate Reasoning and Knowledge-Based Systems
- Designing and Systems, and their Education
- Humanity, Architecture, Conceptualization
- Biocybernetics and Mathematical Biology
- Systems and Ecology
- Cybernetics and Informatics in Medicine
- Cybernetics of Socio-Economic Systems
- Systems, Management and Organization
- Cybernetics of National Development
- Communication and Computers
- Intelligent Autonomous Systems
- Cybernetic Principles of Knowledge Development
- Cybernetics, Systems and Psychotherapy
- Artificial Neural Networks and Adaptive Systems
- Artificial Intelligence and Cognitive Science
- AI and Systems Science for Peace Research

Calender of Events

Title		CfP: Call for Papers, FP: Final Paper due:
Human Science research: a Systemic Approach (Summer Course)	July 18-24, 1993 Castel Ivano, Strigno, Italy	Saybrook Institue et. al., Rich McGoo tel: +415-441-5034, fax +415-441-7556
1993 System Dynamics Conference: The Role of Strategic Modelling in International Competitiveness	July 19-23,1993 Mexico City CfP: expired	J.A.D. Machuca, Dept. of Finance and Op. Mgt, Avda. Ramon y Cajal, 1-41018 Sevilla, Spain fax: (345) 4-55-7570
3rd UKSS Int. Conf. on Systems Sciences: 'Adressing Global Issues'	July 27-30,1993 Univ. of Hull,Scotland CfP: expired	F.A.Stowell, Dept. Computing Science, Paisley College High Street, PAISELY PA1 2BE Renfrewshire, Scotland
EUROMICRO 93: Open Systems Design	Sept 6-9, 1993, Barcelona, Spain CfP: expired	EUROMICRO, PO Box 2346, NL-7301 EA Apeldoorn fax: +31-55-557393
Colloque Intelligence Artificielle et Epistemologie	Sep.30 - Oct.2,1993 Tramelau,Switzerld	J.-P. Müller, Inst. d'Informatique, Universite de Neuchatel, Rue de Manruz, CH-2000 Neuchatel, Switzerland
CES2: 2°Congrès Européen de Systémique (2nd Europ. Congress on Systems Science)	Oct. 5-8 1993,Prague Jan. 30, 1994	AFCET, CES2, 156 Bd Pereire, 75017 paris, France tel: +33-1-47662419, fax: +33-1-42679312
INTERAKTION - Modellierung, Kommunikation und Lenkung in komplexen Organisationen	Oct. 8-9, 1993, Koblenz, Germany	Prof. Dr. B. Schiemenz, Inst. f. Wirtschaftsinformatik Rheinau 3-4, 5400 Koblenz, Tel: (0261) 9119-481 fax -37524
5th Annual Conf. on Comprehensive Systems Design of Education	Nov.14-19,1993 Monterey, Calif.	Bela H. Banathy, 25781 Morse Drive, Carmel CA 93923 tel/fax: (408) 625-3178,
12th European Meeting on Cybernetics and Systems Research, Vienna	Apr. 5-8, 1994 Vienna, Austria CfP: Oct 5, 1993 FP: Dec 1993	Robert Trappl, Dept. of Med. Cybernetics & AI Univ. of Vienna, Freyung 6/2, A-1010 Vienna, Austria tel: +43-1-53532810, Fax: +43-1-5320652 E-mail: sec@ai.univie.ac.at
CAST'94 , 4th Int. Workshop on Computer Aided Systems Technology	May 9-13, 1994 Ottawa, Canada	Tuncer I. Ören, Univ. Ottawa, Computer Science Dept. Ottawa, On., Canada K1N 6N5 tel: + (613) 564-5068, fax (613) 564-7089
STIQE'94: 2nd Int. Meeting on Systems Thinking, Innovation, Quality and Entrepreneurship	Dec. 1994, Maribor, Slovenia	M. Rebernik, EPF, Univerza di Maribory - 62000 Maribor, Slovenia tel.: 062-28-261, fax 062-27056