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Founding Editor: F. de Hanika · Editor: Stephen Sokoloff · International Federation for Systems Research Schottengasse 3, A-1010 Wien, Austria · Electronic Mail: K 323390 @ aearn, Bitnet



CHARLES FRANCOIS

Also the operational algorithm, simple or complex, must be antroduced by a mind, and the machine cannot produce anything other than what is contained in its program. Therefore artificial intelligence is still largely dependent upon natural intelligence.

For some years now, however, we've seen the emergence of expert systems, which handle not only data, but also knowledge. This knowledge is kept apart from the rules governing its handling, which constitute a second systems level, a sort of "metaknowledge" in the form of algorithmic combinations.

Expert systems have already produced spectacular results. A system of this type can include the total knowledge of many human experts, and its algorithmic operation sometimes leads to the discovery of things which all of the specialists — even the designers of the system — had failed to notice. Of course the operations are carried out much more rapidly and exhaustively in artificial than in natural inalligence systems.

No expert system is, however, capable being independent-

# Artificial Intelligence is becoming more Brainlike

#### **Charles Francois**

Asociation Argentina de Teoria General de Sistemas y Cibernetica

Libertad 742, 1640 Martinez, Argentinien (Reflections on a lecture by Brother J. M. Ramlot O. P.)

Computers are to an increasing extent taking on problems previously reserved for humans. Nowadays many of them can deal not only with data but also with knowledge. The gap between artificial and natural intelligence is gradually closing; therefore we have to constantly reevaluate the differences between both forms.

Artificial intelligence can compete successfully with natural intelligence 1) in resolving equations and 2) in demonstrating and even in finding previously unknown demonstrations for mathematical theorems. The algorithmic and sequential capabilities needed to perform these tasks can be found in both human brains and computers — but the computer does this kind of work much faster.

Nevertheless the machine still needs an operator to put the data into it, or at least to equip it with a collecting device. Besides, it generally isn't able to discern whether the data is correct.

ly creative and of inventing something which is not implicit in its algorithm. The computer's limits are obvious:

- it doesn't "know" (isn't conscious of) what it knows (what's in its memory and its algorithm). (At least, we think it doesn't know.)
- it can't break out of its sequentiality. The parallel multisequentiality of some systems is only a first approximation to the truly simultaneous parallelism and the selfinterconnection of natural intelligence.
- it's a prisoner of binary logic, which implies a particular type of reductionism.

However artificial intelligence may cross a new threshold in the coming years, since we are now gaining a better understanding of some properties of the brain. The following ones seem particularly interesting:

- It has a fantastic combinatory capacity.
- It begins practically virgin, which is why we remember almost nothing about the first years of life.
- Making use of varied means of learning, it must organize itself.

- It must acquire perceptual and conceptual selectivity without having to actively register everything in its surroundings.
- havior of a natural intelligence system is concerned.

-It is capable of forgetting.

These characteristics lead us to some surprising conclusions when we take Ashby's ideas about variety and constrictions into consideration:

- The brain receives and processes many observations simultaneously.
- —The brain needs to form algorithms in order to be able to function usefully in its super-complex and constantly changing environment.
- —The "algorithmization" can be transferred from brain to brain, and is called instruction/education.
- —Learning leads to the formation of mental algorithms by trial and error. Any algorithm can arise as a result of the repeated strengthening of correct answers; it therefore represents a set of organizing constrictions.
- —Once established, the algorithm replaces chance behavior with determined behavior. This determination is, however, never absolute, probably because of the great potential of the algorithms acquired in childhood and youth.
- The algorithmic functions acquired by the brain tend to partly block creative capacity. This phenomenon undergoes rapid enhancement during adolescence and youth
   with few exceptions, older people are no longer creative.
- —The ability to forget seems to be indispensible for relieving the brain of useless data. The mechanism for forgetting is, however, by no means completely understood.

On the basis of these characteristics we can conceive of a type of artificial intelligence which could go much further than the most advanced machines currently available and come to much more closely resemble natural intelligence. The prerequisites for this type of system are:

- -the ability to "learn" not only the contents of data but also behavior patterns.
- -the simultaneous functioning of many units.
- —the formation of interconnections, at first by chance, between these units.
- -the progressive dynamic stabilization of certain of these interconnections (ultrastability).
- —the maintenance of a great deal of variety, partly by random utilization of the algorithms which are formed.
- —an ability to selectively destroy certain portions of a memory.

#### The essential differences between current artificial and natural intelligence systems lie in the following characteristics of the latter:

- -Their multi-simultaneous mode of operation prevents them from becoming absolutely determined.
- —The entire algorithm acquired by the brain is so large and complex that no human can possibly use all its potential contents.
- —The "algorithmization" is never complete. A virgin reserve (potential for variety) is always left over. Thus there is always a margin of imprevisibility as far as the future be-

# GENERAL SYSTEMS LEARNING FOR COMMUNITY DEVELOPMENT

#### **Robert Domaingue**

University of Wisconsin, Madison, WI. 53706, USA

It is time for general systems learning to come down out of the ivory tower! Discussions involving systems learning have heretofore mostly been confined to purely academic issues such as comparisons of different systems curricula and systems departments. Of course such considerations are important, but by focussing our entire attention upon intrauniversity concerns we have been missing out on some crucial opportunities to convert general systems theory into an instrument for alleviating local problems. The contemporary community is after all complex and there is an overriding need for tapping the entire available conflict-solving potential.

The breakthrough I would like to see can only be made if we shift our focus. We should try to put the tools of general sy\_\_\_\_\_\_stems theory into the hands of the people who need them — those who are involved in local affairs on a practical level. The goal should be to make the average citizen a general systems practitioner. I believe this would lead to a reinvigoration of general systems theory and to an improvement of the quality of everyday life.

But how can we accomplish this aim? I propose that we concentrate upon teaching part-time adult students. We should develop night and weekend programs — curricula, to which working people could have access and which would be relevant to their needs. This would be an ideal means of spreading the good news about the potentials of systems theory.

General systems theory must succeed in bridging the gap between elite academic institutions and the everyday world. We should get out of the current dead-end street!

**Editor's comment:** I would welcome articles about practical applications of systems theory with concrete example.

# **EUROCAST '89**



PROF. FRANZ PICHLER, AUSTRIA (LEFT, WITH GLASSES) PROF. BERNARD ZEIGLER, USA (MIDDLE) PROF. ROBERTO MORENO-DIAZ, SPAIN (GENERAL CHAIRMAN EUROCAST '89 — RIGHT)

# **EUROCAST '89**

#### **Bernard P. Zeigler**

The University of Arizona Tucson, Arizona 85721, USA

EUROCAST '89 was held at the Universidad Politecnica de Canarias, Las Palmas, Canary Islands (Spain) from February 26 to March 3, 1989. Some 30 scientists from around the world met with about the same number of Spanish researchers in this tropical vacation paradise.

The theme was set by Prof. Franz Pichler of the Laboratory of Systems Theory, Johannes Kepler University (Linz, Austria): <u>Computer Aided Systems Theory</u>. CAST is striving to crystallize current systems theoretical advances in a manner such that engineers in the next century and beyond will be able to make use of them. CAD (Computer Aided Design) and CAM (Computer Aided Manufacturing) provide sets of tools increasingly available on high-performance workstations. However the development and use of such tools should have the sound theoretical base that systems theory can provide. This would lead to a minimization of reinventions of old concepts in slightly varying guises and vould unify the set of newly developed tools, thus enabling them to provide mutual enrichment within a cumulative growth pattern.

# **Pathways to CAST**

Of course different viewpoints do exist and several of them were evident at the workshop. Classical control theory, highly developed in the 60's and 70's, is now embodied in such CACSD packages as CONTROL-C and MATHLAB. Raimo Ylinen of the Helsinki University of Technology demonstrated that the power of modern computing makes it possible to realize fundamental improvements in the theory of linear systems. W. Jacak of Wroclaw University showed how nonlinear control for the design of robotic movement also needs further development and CAST support if it is to be integrated with higher-level planning stages. Similar developments in signal processing, as represented in the new field of computer algebra, were discussed by Thomas Beth *i* Karlsruhe University.

Starting from systems concepts originating with Zadeh and Desoer as well as with Wymore and Mesarovic, Franz Pichler's group in Linz is actively implementing systems theory method banks. These are environments realized on stateof-the-art, user-friendly programming systems which enable the engineer to apply existing systems-theory methods towards the solution of engineering problems. Objectoriented facilities are thereby exploited to organize methods according to a hierarchy of systems classes. The goals of method bank research are to:

- construct and implement specific systems theory method banks and integrate them into existing CAD tools.
- carry out case studies showing successful applications of such method banks to engineering design problems.
- investigate new knowledge-based paradigmas to support the use of CAST method banks in problem solving.
- develop and implement new curricula for CAST in engi-

neering education.

The general systems methodological framework of George Klir (Suny-Binghampton) provides another pathway to CAST. Although an inclusive framework, its focus has until recently been on supporting inductive modelling applicable to data sets where there is little a priori knowledge of key relationships. However, as Klir and as Doug Elias of Cornell University reported, the current goal is to integrate support for other systems activities in the form of Systems Toolkits, a reimplementation of the earlier GSPS package.

Bernard Zeigler of the University of Arizona and Tuncer Øren of the University of Ottawa represented a somewhat different perspective. They emphasized modelling and simulation formalism as foundations for CAST environments. In order to attain a compatibility of interfacing with method banks, such formalisms and languages must themselves be grounded in systems frameworks. Most simulation packages do not qualify in this regard, but more recent ones such as GEST and DEVS-SCHEME were designed to fulfill this criterium. Such environments are precursors of knowledge-processing environments which will be able to transform knowledge from one form to another and even to generate new knowledge.

Areas of application for CAST environments were also discussed. The designing of computer software and hardware needs CAST-support right now. Artificial vision and perception systems and intelligent robotics were intensively dealt with at the meeting, especially by the colleagues of the organizer, Roberto Moreno-Diaz. These systems are still to a much greater extent than the ones mentioned above in the research stage but they can nonetheless profit considerably from the integrated knowledge representation schemes provided by systems concepts.

# **Problems and prospects**

As the first full-scale workshop of its kind, the Las Palmas meeting was a success. Much, however, remains to be done before the aims of CAST can be realized. There are three interrelated goals that stand out:

- Systems theory concepts should be made comprehensible to practical and research engineers; these professionals should be able to relate the techniques they develop to these concepts. This is the only way we will be able to attain a cumulative growth in systems knowledge and avoid the repeated "re-invention of the wheel".
- 2) We need to implement and elaborate existing systems theory in powerful new methods and tools. Such tools are, for example, required to carry out operations on system models that preserve desired structural and behavioral properties (homomorphisms). Model construction and simplification, design refinement and other important activities would greatly profit from possessing the capacity for dealing with abstractions.
- 3) We need to continue to push systems theory to new depths and domains. For example there is an almost total lack of systems theory for supporting the design and modelling of variable structure systems — systems whose structures undergo fundamental changes over time. Likewise, we need a systems theory of intelligent agents,

which for example deals with the ability of these agents to construct and use models. How, for instance, can such agents model themselves and others without getting into endless recursion? Artificial perception needs to be related to the goals of the system which it serves. The state-of-theart might be considerably advanced by viewing perception as a means of continually updating the agent's world model. To achieve its goals, the CAST research community will have to unify its paradigms and strengthen its numbers and funding sources. As Franz Pichler pointed out, CAST must become indispensable to its "users". CAST meetings are already in the works for the near future.

In Las Palmas a carneval was in full swing during the present workshop. Its frivolity served as a stimulating backdrop to the weighty task initiated by EUROCAST '89...

# REPORT OF THE SOCIETY OF MANAGEMENT SCIENCE & APPLIED CYBERNETICS (INDIA)

#### **Current officers**

1. Mr. Nitin Desai	President	(Special Secretary Planning Commission, Govt. of India)
2. Mr. Lovraj Kumar	Honorary Vice President	(Consultant Energy Advisory Board, Govt. of India)
3. Dr. Ajit Mazoomdar	Honorary Vice President	
4. Dr. G.K. Mukherjee	Vice President	
5. Dr. M.N. Qureshy	Vice President	(Advisor Department of Science & Technology Govt. of India)
6. Dr. A. Ghosal	Secretary	(Council of Scientific and Industrial Research, New Delhi)
7. Dr. P. Sen	Joint Secretary	(Chief Economist Joint Plant Committee Govt. of India)
8. Dr. S. Madan	Treasurer	(Council of Scientific and Industrial Research)

#### The functions of the Society:

- A) to propagate Cybernetics & Systems Sciences through lectures, Seminars, national, international & regional conferences;
- B) to publish an international research journal, SCIMA (Journal of Management Science & Applied Cybernetics);
- C) to work on research and consultancy problems.

#### **Activities (Lectures, Seminars & Conferences)**

A number of distinguished specialists in project Management Science, Cybernetics, etc. held lectures during 1986-87. Now we have replaced the monthly lectures with bimonthly ones. Our current focusses:

a) New developments in the area of Systems and Cybernetics (expert systems, A.I., various applications, etc.)

b) Popular lectures on the present status of these fields.

Our main activity for the year 1987 was the Indian International Congress in Cybernetics and Systems which was held in New Delhi from March 17 to 19, 1987. A number of distinguished scientists from all over the world like Prof. Margaret Boden Prof. Akira Ishikawa, etc. attended. Its main theme was "Cybernetics in practice". It is gratifying to note that considerable breakthroughs have been made in applying tenets of Cybernetics to problems in real life. To this endeavour the Indian experts have made considerable contributions.

# **Publications**

The Society publishes an international research journal SCIMA, which is well received throughout the world. It contains original articles on methodology and applications of Cybernetics to real life and system science.

The proceedings of the Indian International Congress of Cybernetics and Systems, which was held by the Society in March '87, will be published in the form of a monograph.

We have decided to bring out a monograph containing 12 or 13 papers illustrating the scope, perspectives, and various applications of Systems and Cybernetics, with special reference to Indian experiences. Its approach will be pedagogic and illustrative. It will be edited by Dr. A. Ghosal.

#### **Research and Consultancy**

The society is interested in building research teams in certain areas of Cybernetics and Systems. Specifically it intends to develop a group in artificial intelligence and expert systems. Currently the Society is involved in a project on the application of systems and cybernetics to the Natural Resources Data Management System (NRDMS), sponsored by the Department of Science and Technology of the Government of India. The Society is studying the scope of decision making for the purpose of planning and development in various small zones (districts). Our team has developed a methodology for assessing a very small portion of a zone for the purpose of agricultural and industrial development. Eventually, the aim is to develop a decision support system - and perhaps an expert system - with which a computer can propose certain decisions from the knowledge base.

#### Miscellaneous

The Society has decided to develop a comprehensive course in Cybernetics and its applications for possible adoption in Indian universities.

The Society proposes to hold two national conferences during 1988-89. It has also decided to hold an International Conference in 1990. Besides, a number of small workshops will be held in the next five years.

We do not have any bit net number presently. However, the Society journal SCIMA has the number: ISSN: 0376 : 4087.

Title	Date	Place	Deadlines	Further Information
Seventh Workshop European Society for the Study of Cognitive Systems	19 22. June 1989	St. Maximin- la-Ste.Baume, Provence, France		Dr. G.I. Dalenoort (ESSCS) Inst. for Experimental Psychology University of Groningen PO.Box 14 9750 AA Haren, The Netherlands Tel. (0) 50-636472
33rd Annual Meeting International Society for the Systems Sciences (co-sponsor: United Kingdom Systems Society)	2 7. July 1989	Edinburgh Uk	Abstracts 31. Oct. 1988	MS L.J. Davies 99 Godwin Road Stratton St. Margaret Swindon Wiltshire SN 34 XF England
Beijing International Conference on System Simulation and Scientific Computing	15 18. August 1989	Beijing (Peking) People's Republic of China	Abstract or Paper 15 March 1988	Chinese System Simulation Council Beijing Institute of Aeronautics and Astronautics Beijing, China
First international conference on computers for handicapped persons	21 23. August 1989	Vienna Austria	25. Feb. 1989	Prof. Roland Wagner Johannes Kepler University Institute for Computer Science A-4040 Linz, Austria
12th International Congress on Cybernetics	21 26. August 1989	Namur, Belgium	_	Association Internationale de Cybernetique Secrétariat Palais des Expositions Place André Rijckmans B-5000 Namur, Belgium Tel: 081 / 735209
14. Symposium on Operations Research	6 8. September 1989	Ulm W. Germany	Abstracts 15. June 1989	Prof. Dr. U. Rieder Abt. Mathematik VII, Univ. Ulm D-7900 Ulm, W. Germany, Tel. 07 31 / 176 - 3273

# **MEETINGS and COURSES**

Title	Date	Place	Deadlines	Further Information
HCI-International '89 Third International Conference on Human-Computer Interaction	18 22. September 1989	Boston Mass. USA		Dr. Gavriel Salvendy HCI International '89 263 Grissom Hall Purdue University West Lafayette, In 47907, USA Tel. (317) - 494 - 5426
I. International Congress on Systems for Development	19 22. September 1989	Murcia Spain	Final Papers 28. February 1989	5. International Congress SESGE Escuela Universitaria de Informatica Universidad de Murcia San Cristo 1 E-3001 Murcia Spain Tel. (968) 833190 or 833908 Ext. 190 or 204
4. International Conference Fault-tolerant Computing Systems	20 22. September 1989	Baden-Baden Germany	Papers 31. Jan. 1989	VDI/VDE GMA H. Wiefels PO. Box 1139 D-4000 Düsseldorf 1 FRG
Congrés Europeèn de Systemique	3 6. October 1989	Lausanne Switzerland	Full papers 15. January 1989	AFCET CES 1 156, boulevard Péreire F-75017 Paris, France
6th World Congress on Medical Informatics	16 20. October 1989	Beijing (Peking) People's Republic of China	Final papers (Camera ready) 10. January 1989	Ms. Shan Huiquin Medinfo 89 - Secretariat 29 Xueyuan Nanlu Haidian District Beijing, China Tel. 892565, 898516 Cable: 2400
Beijing International Conference on System Simulation and Scientific Computing (BICSC)	23 26. October 1989	Beijing (Peking) China	Abstract or complete draft (two copies) 15. Sept. 1988	Secretariat 1989 BICSC POX. 301 Beijing Institute of Aeronautics and Astronautics (BIAA) Beijing, 10083 China Tel. 2017251-609 Telex: 22036 BIAAT CN
Unternehmensstrategien im sozioökonomischen Wandel	3 4. Nov. 1989	Trier F. R. Germany	Kurzfassung 30. April 1989	Prof. Hans Czan Universität Trier Wirtschaftsinformatik Postfach 2835 D-5500 Trier, F.R. Germany
Third Conference on Quality of Life and Marketing	8 10. November 1989	Blacksburg Virginia USA (Virginia Tech)	Papers 30. May 1989	M. Joseph Sirgy Department of Marketing Virginia Tech Blacksburg VA 24061 Tel. (703) 961-5110
EMCSR 1990 10th European Meeting on Cybernetics and Systems Research	<b>Date 1990</b> 17 20. April 1990	Vienna Austria		Prof. Robert Trappl Department of Med. Cybernetics University of Vienna Freyung 6/2 A-1010 Vienna, Austria
CECOIA II 2e Conférence Internationale sur l'Economique et l'Intelligence Artificielle	2 6. June 1989	Paris France		Prof. Robert Vallée 156, bld. Péreire F-75017 Paris France
8th International Congress of Cybernetics	11 15. June 1989	New York City, USA	Abridged Paper Nov. 89	Prof. Constantin V. Negotia Congress Chairman Department of Computer Science Hunter College, City University of New York 695 Park Ave New York, NY. 10021, USA
DIAC 90 Directions and Implications of Advanced Computing	28. July 1990	Boston Mass. USA	Papers (4 Copies) 1. March 1990	Douglas Schuler Boeing Computer Services MS 7L-64, P.O. 24346 Seattle, WA 98124-0346, USA Tel. (206) 865-3226
Operations Research 1990	28 31. August 1990	Vienna Austria	Abstracts 15. April 1990	Prof. G. Feichtinger Institut für Ökonometrie Technische Universität Wien Argentinierstraße 8 A-1040 Wien, Austria
MIE-European Federation for Medical Informatics Medical informatics 10th International Congress	<b>Date 1991</b> 19 22. August 1991	Vienna Austria		MIE 91 Interconvention A-1450 Vienna, Austria Tel. (43) (222) 23 69 26 41

Offenlegung: Der "IFSR Newsletter" erscheint vierteljährlich in englischer Sprache unter der Redaktion von Dr. Stephen Sokoloff. Die Zeitschrift dient der Information über die Aktivitäten der IFSR. Sie wird kostenlos an Mitglieder ihrer insgesamt 17 Mitgliederorganisationen in 14 Ländern versandt. Die Kosten werden von der IFSR aus den Beiträ-gen der derzeit 17 Mitgliederorganisationen getragen. Präsident der IFSR ist für 1988/90 Prof. Gerrit Broekstra (Niederlande). Vize-Präsident Prof. Dr. Franz Pichler (Österreich). Sekretär-Schatzmeister Dr. Bela Banathy (U.S.A.). Alle Funktionen werden ehrenamtlich ausgeübt. Druck: Druckerei Bad Leonfelden, 4190 Bad Leonfelden (To our readers: To comply with the Austrian "Media Act" every Puplication must at least once year contain a declaration concerning ownership and purpose.)

	(	BLOCK LETTERS PLEASE
Date:Signature:	Name: Prof./Dr./Ms./Mr. Adress:	Cybernetics <ul> <li>My cheque for AS covering the Conference Fee is enclosed.</li> <li>I shall not be at the Meeting but am interested in receiving particulars of the Proceedings.</li> </ul>

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ENTH EUROPEAN MEETING

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CYBERNETICS

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APPROPRIATE

ÖSTERREICHISCHE
STUDIENGESELLSCHAFT FÜR KYBERNETIN
(Austrian Society for Cybernitc Studies)

in Cooperation with UNIVERSITY OF VIENNA DEPARTMENT OF MEDICAL CYBERNETICS AND ARTIFICIAL INTELLIGENCE

EMCSR 90

Preliminary Programme and Invitation of Papers

# Tenth European Meeting on Cybernetics and Systems Research

April 17 - 20, 1990

at the UNIVERSITY OF VIENNA (Main Building)

#### EMCSR 90 — Secretariat:

Österreichische Studiengesellschaft für Kybernetik A-1010 Wien I, Schottengasse 3 (Austria) Telephone +43-222-535 32 81-0 Fax +43-222- 63 06 52 E-mail: sec @ai-vie, uucp EMCSR 1990 TENTH EUROPEAN MEETing ON CYBERNETICS AND SYSTEMS RESEARCH Vienna, April 17 - 20, 1990

#### CHAIRMAN:

Robert Trappl, President Austrian Society for Cybernetic Studies

#### SECRETARIAT:

G. Bröckner G. Helscher

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ORGANIZING COMMITTEE:

G. Bröckner E. Buchberger G. Helscher W. Horn J. Matiasek F. Pichler R. Trappl H. Trost

#### CONFERENCE FEE:

Contributors: AS 1600 if paid before January 31, 1990 AS 1900 if paid later Participants: AS 2500 if paid before January 31, 1990 AS 2900 if paid later The Conference Fee includes participation in the Tenth European Meeting, attendance at official receptions, and the volume of the proceedings available at the Meeting. The remarkable innational support for the European Meetings on Cybernetics and Systems Research held in Austria in 1972, 1974, 1976, 1978, 1980, 1982, 1984, 1986, and 1988 (when 239 scientists from 28 countries met to present, hear and discuss 160 papers) encouraged the Council of the Austrian Society for Cybernetics Studies (ÖSGK) to organize a similar meeting in 1990. Our aim is to keep pace with continued rapid developments in related fields.

A number of Symposia will be arranged and we are grateful to colleagues who have undertaken the task of preparing these events. As on the earlier occasions, eminent speakers of international reputation will present latest research results in daily plenary sessions.

#### SYMPOSIA:

- A General Systems Methodology G. J. Klir, USA
- B Fuzzy Sets, Approximate Reasoning and Knowledgebased Systems
- C. Carlsson, Finland Designing and Systems
- C Designing and Systems B. Banathy, USA, and W. Gasparski, Poland
- D Humanity, Architecture and Conceptualization G. Pask, UK
- E Cybernetics in Biology and Medicine L. M. Ricciardi, Italy, and G. Porenta, Austria
- F Cybernetics of Socio-Economic Systems G. Balkus, USA, and O. Ladanyi, Austria
- G Workshop: Managing Change: Institutional Transition in the Private and Public Sector
  - M. U. Ben-Eli, USA, and G. Probst, Switzerland
- H Innovation Systems in Management and Public Policy G. Rosegger, USA, and H. Hübner, FRG
- I Systems Engineering and Artificial Intelligence for Peace Research
- H. Chestnut, USA, and P. Kopacek, Austria
- J Communication and Computers A. M. Tjoa
- K Software Development for Systems Theory F. Pichler, Austria, and G. Chroust, Austria

L Artificial Intelligence C. Habel, FRG, and H. Trost, Austria

- M Parallel Distributed Processing in Man and Machine G. Dorffner, Austria and D. Touretzky, USA
- N Impacts of Artifical Intelligence E. Buchberger, Austria, and O. Oestberg, Sweden

#### TUTORIALS:

We plan to organize a tutorial on "Fundamentals of Cybernetics".

#### PANEL

A panel entitled "Organizational Cybernetics, National Development Planning and Large-scale Social Experiments" is scheduled to take place within the framework of the Meeting. S MISSION OF PAPERS: Acceptance of contributions v be determined on the basis of Draft Final Papers. These Papers may not exceed 7 single-spaced A4 pages, (in English). They have to contain the final text to be submitted, but graphs and pictures need not be of reproducible quality.

The Draft Final Paper must have the title, author(s) name(s), and affiliation in this order. Please specify the symposium in which you would like to present your paper. Each scientist shall submit only one paper.

Please send **three** copies of the Draft Final Paper to the Conference Secretariat (not to the symposia chairman!)

DEADLINE FOR SUBMISSION: October 15, 1989.

In order to enable careful refereeing, Draft Final Papers received after the deadline cannot be considered.

FINAL PAPERS: Authors will be notified about acceptance no later than November 20, 1989. They will be provided by the publisher of the proceedings with the detailed instructions for the preparation of the final paper.

PRESENTATION: It is understood that the paper is to be presented personally at the Meeting by the contributor.

HOTEL ACCOMMODATIONS will be handled by ÖSTERREI-CHISCHES VERKEHRSBÜRO, Kongreßabteilung, Opernring 5, A-1010 Vienna, phone (222) 58 80 00, telex 111 222, fax (222) 56 85 33. Reservation forms will be sent to all those returning the attached postcard.

EMCSR 90

# We look forward to meeting you in Vienna!

# RESEARCH 1990 TENTH EUROPEAN MEETING ON CYBERNETICS AND SYSTEMS Organizing Committee of the

POSTCARD

c/o Österreichische Studiengesellschaft für Kybernetik

Schottengasse 3 A-1010 WIEN 1 (AUSTRIA)