IFIP newsletter
International Federation for Information Processing

Editor:
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CONFERENCES PLANNED ON PROBLEM-SOLVING

IF'- ` September 1989, IFIP's General Assembly approved the formation of a new Technical Committee on Artificial Intelligence (TC12) in San Francisco. Since then, the TC12 chairman, ***Prof. Dr. Robert Meersman (NL),*** has made plans for four Working Groups (WGs) and appointed acting officers for them.

At least one of the provisional WGs appears to be "off to a running start." WG12.3 on Problem Solving, headed by acting chairman ***Prof. Laurent*** I ***(NL),*** has an ambitious program, including an annual workshop on "Advances in Problem-Solving" and a major working conference approximately every two years.

The first annual workshop on " Advances in Problem-Solving" will be held -14 October 1990 in Balatonfüred, Hungary. It will bring together young and seasoned researchers in problem-solving, in an open, intensive, multidisciplinary environment conducive to lively discussion. For further information, one may contact Prof. *Siklóssy,* whose address is given below.

Low-Quality Information

WG12.3 plans the first International TC12 Working Conference on "Low-Quality Information (LQI)" 10-12 March 1991 in Montpellier, France. Processing LQI is an emerging new area of information processing. Until now, most of the information processed by computers could be categorized as high-quality information. In fact, much effort

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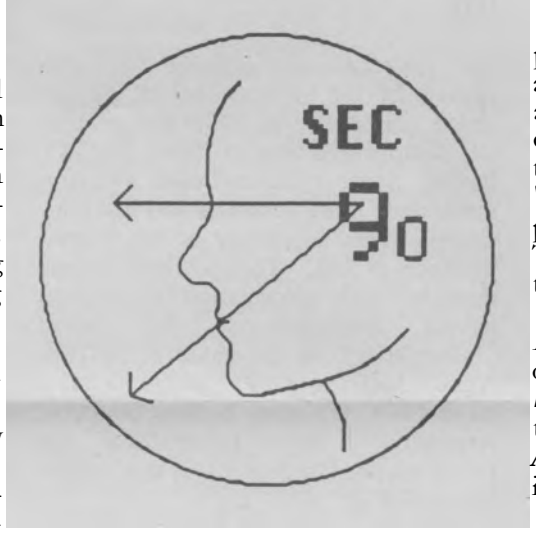
COMPUTER SECURITY AND INFORMATION INTEGRITY IN OUR CHANGING WORLD



From 23 to 25 May, IFIP's Technical Committee on Security and Protection in Information Processing Systems (TC 11) held its sixth International Conference and Exhibition on Information Security (IFIP/Sec'90) in Espoo, Finland. Approximately 350 participants, from 29 countries, attended the Conference, which was hosted by the Finnish Information Processing Association. ***Prof. Klaus Dittrich (D)*** was chairman of the International Program Committee, Mr. limo ***Silvennoinen*** (SF) was chairman of the Organizing Committee, and ***Mr. Juhani Saari (SF)*** was chairman of the Steering Committee.

Thirty-four papers were presented, on a diverse set of topics, including ethics, privacy, personnel, "trusted" systems, risk management, distributed systems, database management systems, object-oriented systems, smart cards, computer viruses, and computer crime. A great deal of attention was paid to security of distributed systems and computer networks, representing a shift from the emphasis in earlier IFIP/Secs on the security of isolated systems. Many of the papers gave lists of principles — do's and don'ts for achieving security or avoiding system failures. Others were concerned with defining terms and establishing taxonomies. Some expressed "alarm," and others detailed catastrophes associated with failures in security. There were also case studies of prototype and production systems.

A brief summary of the current status of computer security was given by Ms. ***Linda Taylor (USA)*** in the introduction to her paper *CASE Tools and Security: A Solution or a Problem? ** part of which is quoted here:

> Since the advent of computers, computer system security problems and

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** (6)* IFIP

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The Secretariat can also answer inquiries about IFIP.

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Kindly submit material for the *Newsletter* three months before the publication date.

Please send the following IFIP information directly to the Secretariat: announcements of conferences, workshops, and other meetings; calls for papers; appointments to committees and other positions; and changes of address. The Secretariat is the clearinghouse for all such information; it will forward it to the *Newsletter.*

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SADIO, THE ARGENTINE SOCIETY FOR INFORMATICS AND OPERATIONAL RESEARCH

*by Mr. Hector Monteverde (RA) **

The 1960s began with strong economic and technological development in Argentina. Two scientific societies were established in 1960, SADIO (Sociedad Argentina de Investigación Operativa) for operational research and SAC (Sociedad Argentina de Cálculo) for computing. They jointly organized a national meeting, and a year later, eager to be in contact with the rest of the world, SADIO joined the International Federation of Operational Research Societies (IFORS, a sister society of **IFIP),** while SAC did the same with **IFIP.**

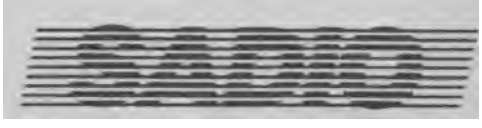
SAC was adversely affected by a disruption of the environment of Argentinian universities in 1966 and eventually disappeared around 1974. SADIO, having closer relations with industry, maintained more activities and had continuity, absorbing many of the former members of SAC. Then SADIO became involved with information processing, having incorporated the word "informatics" in the name of its 10th Annual Meeting in 1977 and in its charter in 1978. (Its name became Sociedad Argentina de Informática Investigación Operativa.) It was admitted to **IFIP** in 1979.

In an environment marked by growing economic difficulties, lower priority of education, and reduced support for research in technology, SADIO has sustained links between the local technical community and friendly technological centers in Latin America and developed countries.

Currently SADIO has more than 1000 members among practitioners, university lecturers, students and a few companies (patrons). Since 1983 it has had its own premises in Buenos Aires, with a small classroom for professional seminars and a couple of meeting rooms for the Council and Interest Groups. It has two small computers for educational and administrative use.

SADIO also runs and maintains CEDINFOR, a library on informatics, established in 1987 jointly with the local chapter of the Computer Society of the Institute of Electrical and Electronics Engineers (IEEE) and the Science and Technology Secretariat of the Argentine government, and publishes a newsletter in Spanish. It has tried several times to publish a journal which, unfortunately, has proved to be a difficult task.

There are Special Interest Groups on Artificial Intelligence, CAD/CAM, Education, Documentation, C Language, Small Computers, and History of Informatics that meet monthly, exchanging information and experiences and organizing professional seminars.



SADIO has been consulted by the government since 1984, and it has participated in the creation of the Brazilian-Argentine Program for Research and Advanced Studies on Informatics, which has run four successful summer schools, with an attendance of 500 each.

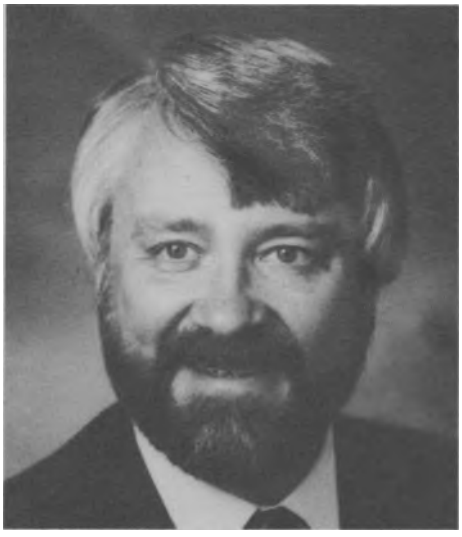
The main activity of SADIO is the annual Meeting on Informatics (JAIIO), which attracts about 600 participants. Usually, it takes place in Buenos Aires. Sometimes it is held in conjunction some other Latin American event, such as a conference of CLEI (a Member of **IFIP)** or CLAIO, as will be the case following the **IFIP** General Assembly, in Buenos Aires, this year. ■

* General Assembly representative of Argentina

IFIP CONGRESS '92

Although we previously indicated we would print an article about the structure of the technical program of **IFIP** Congress '92 (which will take place 7-11 September 1992 in Madrid) in this issue of the ***IFIP*** *Newsletter,* it seems preferable to publish the article after the General Assembly's discussion of the Congress in Buenos Aires in September 1990.—Ed.

Who's Who in IFIP: Dr. RONALD UHLIG



Dr. *Ronald Uhlig,* chairman of IFIP's Technical Committee on Data Communication (TC6), was born in St. Louis, Missouri. He received his bachelor's degree in Physics from the Massachusetts Institute of Technology in 1961 and his doctor's degree in High Energy Physics from the University of Maryland in 1966. Upon receipt of his Ph.D., he served in the Army in the Pentagon, and later as a civilian in the same staff position.

From 1969 to 1978 he was Chief of the Scientific and Management Information Division of the U.S. Army Materiel Command in Washington, D.C. There he was responsible for management, throughout the U.S., of computers used to support research and development activities of Army laboratories and test

From 1978 to 1984 *Dr. Uhlig* held a series of positions with Bell-Northern Research Ltd. in Ottawa, Ontario. In 1984, he moved to Richardson, Texas to join the parent company, Northern Telecom, where he has held a number of major positions, including Director of International Market Development, Pacific, for Northern Telecom World Trade, Director of International Market Development for the Networks Division, and Director of Networks Consulting for the Networks Division.

He is a co-author of the book *The Office of the Future,* published by the North Holland Publishing Company in 1979. This was the first major book on office automation. The English language edition sold more than 6000 copies, and it is translated into Japanese and Spanish. *Dr. Uhlig* has lectured on every (inhabited) continent.

IFIP Activities

Dr. Uhlig became involved in IFIP's Working Group WG6.5 on International Computer Message Systems in 1978 and served as its chairman from 1978 to 1985. While he was chairman, the WG developed the electronic mail/messaging model that became the basis for the X.400 series of recommendations adopted by CCITT, which are now the standard for electronic message systems worldwide. He has been chairman of TC6 since 1986. *Dr. Uhlig* has also served **IFIP** in several other capacities. In 1983, he was awarded the **IFIP** Silver Core.

In addition to his work in **IFIP,** he has served on the Board of Governors of the International Council for Computer Communication (ICCC, an Affiliate Member of **IFIP)** since 1980. He was Secretary General from 1984 to 1988 and at present is the ICCC Executive Vice-President. Recently he was appointed ICCC's representative to **IFIP.**

[It is the custom of the ***IFIP*** *Newsletter* to include a few words about the personal interests of **IFIP** officers in their biographies. In the case of ***Dr.*** *Uhlig,* we decided to include the material he furnished just as he wrote it. — Ed.]

My wife, Beverly, and I have five children scattered around the U.S.A., two working and three in different schools.

My most significant personal activities are with my church. The home church is Resurrection Church, in Dallas. Beverly and I usually spend close to an hour there each week singing and dancing; our worship is probably quite different from what the typical *Newsletter* reader would think of as "church." I have worshiped in many churches throughout the world, including such diverse locations as Australia, Hong Kong, Singapore, New Delhi, Jerusalem, Munich, Paris, and London.

It should be fairly obvious that I enjoy travel — otherwise I would go crazy in my job. I have been in 55 countries during the last 16 years. My wife and I both enjoy sampling the food of many different countries and cultures.

I love to ski (intermediate level). My youngest son (currently turning 17) tries to get me to go with him on the advanced (black) runs, but I prefer the intermediate runs. Unfortunately, my form is terrible, but I have a good time. I also enjoy golfing, although I am ashamed to give my handicap. Maybe some day, if I should retire, I can do something about that, but that is some distance in the future.

My principal hobby is reading. I enjoy historical novels (the big, thick ones, great on the long transpacific flights). I love baroque music — especially Bach, Mozart, and Telemann. I particularly delight in good organ music and will go to an organ concert every chance I get, usually when I am travelling. I especially enjoy the great organs in European cathedrals.

CONSTRUCTING PROGRAMS FROM SPECIFICATIONS

The economic production of correct and acceptably efficient programs is perhaps the central issue in Computer Science. The transformational paradigm for software development, in which efficient programs are derived from their specifications by a sequence of transformation steps, has been the focus of extensive research during the past fifteen years. A successful Working Conference on "Program Specification and Transformation" was held by **IFIP's** Technical Committee on Programming (TC2) in April 1986 in Bad Tölz, near Munich.

IFIP Working Group WG2.1, in the belief that this is an appropriate time to bring together once more the major contributors to this field, in another intensive working conference, is planning a TC2 Working Conference on "Constructing Programs from Specifications," which will be held in the San Francisco area 13-16 May 1991. The conference topics span the entire spectrum of formal program specification and derivation. In recent years, these subjects have become the focus of WG2.1.

Apart from authors of accepted papers, attendance at the Conference is by invitation only. No more than 70 participants are expected. The small size is intended to facilitate in-depth technical discussion. For information about submitting a paper, please see the Calls for Papers column on page 14.

The three co-chairmen of the International Program Committee of the Conference are *Prof. Friedrich Bauer (D), Prof. Dr. Helmut* Partsch *(NL),* and *Dr. Douglas Smith (USA).* Local arrangements will be handled by *Dr. Smith. Dr. Bernhard Moller* (D) will edit the proceedings.

WG7.7 ON STOCHASTIC OPTIMIZATION IS OFF TO A GOOD START

*by Prof. Peter Kall (CH) **

At the August 1987 meeting of **IFIP's** Technical Committee on System Modelling and Optimization (TC7) in Tokyo, we agreed that the developments in the field of stochastic optimization deserved a more active consideration by TC7 than they had received so far. Early in 1988 we tried to figure out whether there was an interest among specialists in this area to form a Working Group (WG) within **IFIP.** The response was very positive, so we were able, within a couple of months, to form a group of some 30 experts from 17 countries around the globe.

At its September 1988 meeting in London, TC7 accepted the proposal to form WG7.7 on Stochastic Optimization, as did the responsible **IFIP** bodies, later on.

Meanwhile, WG7.7 formed an activity plan extending into 1994, according to which it will sponsor or co-sponsor a variety of workshops and working conferences.

The first of these events, the GAMM/IFIP Workshop on "Stochastic Optimization: Numerical Methods and Technical Applications," took place at the Universitat der Bundeswehr in Munich, May 29-31, 1990. Prof. Kurt Marti *(D)* was chairman of both the International Program Committee and the Local Organizing Committee. This workshop was a small, — maybe therefore — very effective meeting. The 24 participants from 10 countries were all accommodated on the campus of the host university and thus had plenty of opportunity for discussions of the 18 papers, as well as other problems of mutual interest.

The lectures covered theoretical insight into stochastic programming problems, new computational approaches, analyses of known solution methods, and applications in such very different technical fields as ecology, energy demands, and optimal reliability of mechanical structures. In particular, the applied presentations also pointed to several open methodological problems.

The frank and relaxed discussions we had between representatives of the practical and the theoretical sides were highly appreciated by all participants and should serve as an example for our future events. We owe thanks for this unusual experience to *Prof. Marti,* who did a perfect job, in organization as well as hospitality. He will edit a proceedings volume, provided that the papers are submitted in time and pass a standard refereeing process.

The next WG7.7 workshop was Computer-Intensive Methods in Si. lation and Stochastic Optimization in Vienna, August 23-26, 1990, co-sponsored by the International Institute for Applied Systems Analysis (IIASA) and the University of Vienna. Prof. *Georg Pflug (A)* was chairman of both the Program and Organizing Committees. ■

* chairman of WG7.7, vice-chairman of TC7, and ***IFIP*** *Newsletter* correspondent

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IFIP'S PUBLICATIONS

[As this issue goes to press, *Mr. Graham Morris (GB),* a vice-president of **IFIP,** and the rest of the Executive Board are soliciting bids from publishers and arranging a new contract for the publication of proceedings and other technical publications generated by **IFIP.** Because of the timing of this activity, it was decided not to print this article about **IFIP** publications in the June ***IFIP*** *Newsletter* but to defer discussion until the new contract had been signed. Rather than wait any longer, however, we have decided to print the article now.—Ed.]

The perennial discussion of the future of **IFIP's** publications was held at the Council meeting in Jerusalem in March. The current master contract with **IFIP's** main publisher, Elsevier/ North-Holland, which has published **IFIP** books since 1963, expires 30 June 1991. Who will publish **IFIP** books scheduled for publication after then? A decision will be made soon by the Executive Board and reported in the ***IFIP*** *Newsletter,* as soon as it is known.

On the one hand, **IFIP** wants its books — a major product of its technical activities — to be as widely disseminated as possible. We would also like the books to be affordable and **IFIP** to receive significant income from royalties, which help to fund other **IFIP** activities. On the other hand, our publishers want to maximize their income and do not want to publish books likely to have small sales.

The Publications Committee (PC) reported that approximately 40 **IFIP** volumes would be published by Elsevier in the publication year July 1989–June 1990, a larger number than normal. Three others are being processed by Springer.

Two new documents should be very helpful: *Summary of the Most Important Requirements for Preparing a Camera-Ready Article* (prepared by Elsevier) and *Guidelines for Editors of* ***IFIP*** *Working Conference Proceedings Published Elsevier/North-Holland* (prepared . *Dr. Karen* Duncan *(USA),* former **IFIP** Publications Officer, and *Mrs. Stephanie Smit (NL),* Elsevier's Administrative Editor in charge of **IFIP** books).

Elsevier is attempting to reduce its production time for **IFIP** books from four months to two.

Problems still exist, however. Two-thirds of our manuscripts are delivered to the publisher late. Communication often breaks down among the parties involved in publishing a book. The market for technical books is decreasing.

Finally, PC chairman *Prof. Alex Verrijn - Stuart (NL)* expressed his appreciation for the "energetic contributions" to the PC of Dr. *Duncan* and for the long-term devotion and hard work in behalf of **IFIP** by Mrs. *Smit.* ■

INFORMATICS CURRICULA FOR THE 1990S

*by Ute Brauer (D) **

IFIP's Working Group on Informatics Education at the University Level (WG3.2), whose Scopes and Aims were recently revised, held its first workshop since *B. Levrat (CH)* took over as chairman last January. The workshop was held at Brown University, Providence, Rhode Island from April 5 to 7, 1990. Both *B. Levrat* and *P. Wegner,* Brown University, did a fantastic job; they planned, prepared and organized this event in about half a year — after a preparatory committee meeting at IFIP Congress 1989 in San Francisco last September. In addition to obtaining financial support from IFIP and Unesco (which IFIP's Technical Committee on Education [TC3] is for- Age to obtain rather often), Peter *gner* managed to get sponsorship by the Association for Computing Machinery (ACM) and considerable financial help from the PEW Foundation.

Because of its very interesting topic, "Informatics Curricula for the 1990s," this workshop attracted so many participants (university professors) that it became more a full-size working conference than a mere workshop. Fifty-seven participants from fourteen countries joined together in an excellent working atmosphere, which was also due to the perfect organization by *Peter Wegner* and his staff at Brown University.

The central subjects presented and discussed at the workshop were the new ACM/IEEE (Institute of Electrical and ctronics Engineers) proposals for a Modular Curriculum in Computer Science and newly established curricula in software engineering, in particular that at Carnegie Mellon University (CMU). These were supplemented by personal views of the current situation and of future trends in the U.S. (mainly by *Mary Shaw* of CMU and by *William Wulf* of the U.S. National Science Foundation) and by information about informatics education in several European countries.

Computer Science vis-a-vis Software Engineering

It was astonishing (especially for Europeans) to realize what a deep distinction is made in the U.S. between computer science (seen as an academic field) and software engineering (considered as a practice-oriented engineering discipline) and their respective educational approaches. It seems that the European concept of informatics subsumes both computer science and software engineering but that informatics education is mainly focused on engineering.

The rather controversial debate about what computer science education should be was complemented on the one hand by presentations on current first year courses in computer science (e.g., by *Harold Abelson* of the Massachusetts Institute of Technology, *Wilfried Brauer* of the Technische Universitat Munchen, and Nico *Haberman* of CMU) and on the other hand by methodological and philosophical reflections (e.g., by *David* Gries of Cornell, *Peter Naur* of the University of Copenhagen, Peter *Wegner* of Brown, and *Niklaus Wirth* of the Swiss Federal Institute of Technology [ETH] in Zurich). The main questions were

- How to introduce students to computer science/informatics? By starting from the ideas of computation and information and the use and significance of computing in society, or by first teaching students how to develop, prove correct and really implement programs on a computer.
- What is the main goal of a university education in computer science/ informatics? Is it to produce educated, knowledgeable, creative individuals whose main purpose during their studies is to develop themselves, or is it to produce a large number of competent, reliable engineers who are trained to apply efficiently the most appropriate methods and techniques.

In spite of the many different opinions and approaches, there was considerable consensus on the increased importance of mathematics in computer science and that learning computer science should be enjoyable.

This workshop was a great success for WG3.2. It united many prominent scientists, engaged them in stimulating work and let them have fun — since doing a job successfully is a delight.

The contributions will be published in a book, edited by *Frank Lovis* and *Peter Wegner,* which will appear by the end of 1990 in the ACM/Addison-Wesly series. ■

* TC3 correspondent for the ***IFIP*** *Newsletter*

RESPONSIBILITIES OF NEW IFIP OFFICER S

At its September 1989 meeting in San Francisco, the **IFIP** General Assembly established the new positions of Contracts Officer and Activity Secretary and abolished the existing positions of Publications Officer and Conference Officer, which had some, but not all, of the same functions. Following are the responsibilities of the new officers.

Contracts Officer

Monitor all **IFIP** activity related to contracts.

Draft and (if necessary) negotiate standard contracts for publications and memorandums of understanding for the organization of events.

Negotiate and advise **IFIP** on all cases requiring nonstandard contracts.

Draft policy on publications and events, for the approval of the Publications Committee (PC) and Activity Management Board (AMB), respectively.

Report to the PC and AMB on all matters deemed necessary.

Activity Secretary

Maintain the **IFIP** calendar of events and supply necessary lists for Technical Committees (TCs), AMB, PC and the **IFIP** Secretariat.

Serve as the main contact point between **IFIP** and the organizer(s) of an event.

Coordinate processing of all necessary documents to organize an **IFIP** event. This includes liaison with the PC, Finance Committee, and the **IFIP** Secretariat.

Initiate financial planning for every event.

Supply TCs with necessary information concerning events, for budgeting purposes.

Request close-out reports of events.

Monitor progress of the **IFIP** requested documents for an event and issue necessary reminders.

Report on status to the AMB. ■

To Organizers of IFIP Conferences:
Please send several copies of your Calls for Papers to the **IFIP** Secretariat, in order that the staff may be able to handle queries.

MEDINFO 89 Was Successful

The International Medical Informatics Association (IMIA, an Affiliate Member of IFIP) held its sixth World Congress on Medical Informatics, MEDINFO 89,16– 20 October 1989 in Beijing and 10-14 December 1989 in Singapore. (See the article "MEDINFO Conference Split" on page 10 of the December 1989 ***IFIP** Newsletter.).* Both parts were successful, with nearly 700 attending the Beijing part, and more than 700 attending the Singapore part.

In his address at the closing session in Singapore, Professor Dr. Jos *Willems (B),* the incoming IMIA president, commented on the Conference and indicated his goals for the future. Parts of his address are quoted here.

> A number of the developments that have been presented at this conference will have a significant impact on the provision and quality of health care in the years to come. The slogan for this MEDINFO, "Informatics in Support of Global Health," was well chosen.
>
> At this conference, we have observed again a significant shift in emphasis from managerial applications to decision support and other functions. Many things we heard were impressive, others promising, but let us remain critical and watch our field. I dare say that not everything that has been said or printed is true. We should always carefully assess our data, their quality, relevance and implications, especially when they are stored and handled by computer. **In** this fast moving area of telematics and networking, we should be very careful and aware of ethical implications, confidentiality, and responsibility, for the user and the patient.
>
> We should, at our future MEDINFOs and at other conferences, have a renewed look at the various nontechnical aspects of Health and Medical Informatics. It is our duty — and it is high time indeed — to focus again on various ethical, legal and social issues of modern information technology and information handling. During my term as IMIA President, I will try to do my best to promote and watch this field.
>
> **In** the footsteps of my predecessor, I will try to achieve further the objectives that he specified.
>
> 1. To enlarge and broaden the coordination of the scientific activities of **IMIA.**
>
> 2. To further enhance the international scope of IMIA. As many of you know, thanks to *Prof. Kaihara* (J), [IMIA's previous president] **IMIA** has become an independent organization. Over the years IMIA has grown and, at the age of 20 or 21 — in common accord with IFIP, its parent organization — can now stand on its own feet and be independent. Nevertheless, IMIA will and shall not forget its origin. On the contrary, together with IFIP we hope to organize joint conferences on technical issues, on software engineering, and even on data protection and legal issues.
>
> As president of IMIA, I sincerely hope that MEDINFO 92 will become a great success. I can assure you that we have a team which makes this possible and which will make this happen.

MEDINFO 92, the seventh IMIA World Congress, will be held 6-10 September 1992 in Geneva. For further information, please contact

MEDINFO 92 Administrative Office
Symporg SA
108, route de Frontenex
CH-1208 Geneva, Switzerland
tel: +41 (22) 786 3744
fax: +41 (22) 786 4080

IFIP Apologizes

During the March **IFIP** Council meeting in Jerusalem, the date for **IFIP** Congress '92 in Madrid was changed to 7-11 September 1992. It was recognized that this would conflict with MEDINFO 92, but there was no satisfactory alternative. This represents the second time that the dates for **IFIP** Congress '92 were changed. Scheduling the Congress was difficult initially because of attempts to coordinate it with the annual Spanish data processing equipment exhibition. The most recent change was due to the unavailability of facilities for the dates established previously. The IFIP Council deeply regrets this conflict in scheduling, and **IFIP** will do its utmost to avoid similar problems in the future. ■

Integration /s a Major Theme

The fourth International Conference on "Computer Applications in Production and Engineering" (CAPE) will take place 10-12 September 91 **in** Bordeaux. Prof. Guy *Doumeingts* **(F)** is chairman of the International Program Committee. The proceedings will be published by Elsevier/North-Holland before the Conference.

The aim of the Conference is to promote the application of research and advanced developments of computer science in industry, more precisely in such manufacturing activities as design, specification, planning, production-control and quality assurance, maintenance, and management.

The industrial world has become familiar with the topics discussed in CAPE conferences, and technology has attained a high level of automation. Yet the effects of automation on manufacturing systems have shown the limits of a purely technological approach. This is why one fundamental concept is emerging now, that of *integration* of all components and functions, whether they be the economic evaluation of return on investment, performance measurement, or human and social aspects. New paradigms must be considered, as innovations are expected in these fields in the years to come.

As the ESPRIT (European Strategy Programme for Research and Development in Information Technology) projects were launched seven years ago 1991 seems the right time for a presentation of the results attained by this program in the domain of CIM (Computer-Integrated Manufacturing). ESPRIT will not be the only major European program discussed in the Conference, as the results of the EUREKA program will also be presented.

The day before the Conference, several tutorials will be given by leading experts. During the three days of the Conference, two plenary sessions will be organized each day, followed by technical sessions held in parallel. The plenary sessions will be devoted to invited papers presenting the state of the art. Technical tours before and after the Conference will travel throughout

continued on page 7

NEWS FROM IFAC

International Conflict Resolution Using Systems Engineering

*by Dr. Harold Chestnut (USA) **

The IFAC [International Federation of Automatic Control, a sister society of **IFIP]** Workshop on "International Conflict Resolution Using Systems Engineering" took place in Budapest, Hungary 5-8 June 1989. The Workshop provided an opportunity for updating and reporting some of the work that has taken place by control and systems engineers and others to seek supplemental ways, besides predominantly military ways, for resolving international conflicts. During the past six years, many changes have taken place as people skilled in various areas, such as political sciences, economics, social studies, reselling and simulation, artificial intelligence and expert systems, military strategy and weaponry, as well as private business and industry, have worked to reduce the likelihood of a major military war between the U.S.S.R. and the U.S.A.

The 25 participants in this Workshop came from 12 countries and presented 25 papers on different aspects of the topic. In addition, contributions came from Unesco and the United Nations Secretariat. Representatives from less developed as well as from more developed countries participated in the Workshop. East-West as well as North-South issues were discussed in a cordial and constructive fashion.

The systems engineering approach to *the* design and construction of an international information system to increase the likelihood of international stability and peace indicated that a Cooperative Security System should be put into place to provide international decision makers with timely and useful information to help them resolve international conflicts without war. ■

* chairman of the IFAC working group on Supplemental Ways for Improving International Stability (SWIIS)

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Europe — mostly in Germany and France — to visit the most advanced CIM systems that have been implemented.

For additional information, see the Calls for Papers column on page 14. ■

DEPENDABLE COMPUTING FOR CRITICAL APPLICATIONS

*by Dr. Jean-Claude Laprie (F) **

Increasingly, individuals and organizations are developing or procuring sophisticated computing systems on whose services they place great reliance. Under differing circumstances, the focus is on different properties of such services, e.g., continuity, performance, real-time response, ability to avoid catastrophic failures, and prevention of deliberate privacy intrusions. The notion of dependability of a computer system, defined as the trustworthiness of the delivered service such that reliance can justifiably be placed on this service, enables these various concerns to be subsumed within a single conceptual framework. Dependability thus includes as special cases such attributes as reliability, availability, safety, and security.

In August 1989, IFIP's Working Group 10.4 on Dependable Computing and Fault Tolerance organized a Working Conference on "Dependable Computing for Critical Applications" to encourage development of a unified framework integrating the approaches, methods and techniques for specifying, designing, building, assessing, validating, operating, and maintaining computer systems that should exhibit some or all of the attributes of dependability. The Conference, sponsored in cooperation with the Technical Committee on Fault-Tolerant Computing of the IEEE Computer Society and Technical Committee 7 on Systems Reliability, Safety, and Security of EWICS, was held in Santa Barbara, California, August 23-25, 1989. It was chaired by Prof. *A. Avizienis (USA)* and Prof. *A.* Costes *(F).* The Program Chair was Dr. *J.-C. Laprie (F). Prof. J.P.J. Kelly (USA)* was in charge of the local organization. This was the first conference organized by WG10.4.

The program was designed to promote the exchange of ideas by extensive discussions. All the paper sessions ended with 30-minute discussions. The titles of the paper sessions provide a flavor of the technical contents: Validation, Design Diversity Assessment, Application-Oriented Systems, Experimental Evaluation, Modeling and Evaluation, Architecture, Design for Security, Security and Fault-Tolerance, and Fault-Tolerant Distributed Systems. In addition to the paper sessions, in which twenty papers were presented, three panel sessions were organized. The first panel, extending over two sessions, concerned the successes and limitations of experimental methods in gaining evidence of dependability of computing systems intended for critical applications. In one session, people who have major responsibility for such systems spoke, and researchers were discussants; in the other session, their roles were reversed. The second panel addressed the societal issues involved in the utilization of computers in critical applications, such as balancing the risks incurred against the benefits to be gained.

Total attendance was 97 persons, of whom 60% were from places outside North America. Half of the participants came from academic institutions, but industrial and governmental organizations were very well represented.

A second Working Conference will be held in Tucson, Arizona February 18-20, 1991. ■

* chairman of WG10.4

TECHNICAL COMMITTEE CHAIRMEN

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IFIP PUBLICATIONS AVAILABLE

New **IFIP** workers should be aware of the availability of the following **IFIP** publications from the **IFIP** Secretariat:

- Information Bulletin
- Statutes and Bylaws
- Standing Orders
- *What Is **IFIP?***
- 6-Year Plan (list of planned **IFIP** events)
- WG Chairman's Handbook
- Event Approval Guidelines
- Policy on Working Conferences
- Publications Policy
- Guidelines for Editors of **IFIP** Working Conference Proceedings

solutions have generated an ever increasing amount of interest. Initially, security of systems was considered to be an issue only for military and intelligence systems. However in the late 1970s, as financial institutions started offering automated tellers and automated international monetary transfers, and these systems were violated, industry's interest and activity in systems security increased markedly.

At the same time, entire organizations were created to "solve" computer systems security problems. Most of these efforts focused on the hardware itself, the physical environment, or on operating systems.

Approaches to these types of security have been extensively researched and implemented. We have ruggedized hardware systems, security for systems facilities and communications, security kernels for operating systems, and the United States Digital Encryption Standard. Why then do we have this new, late-1980s resurgence of interest in system and data security? Because of the proliferation and greater dependency on systems in every aspect of our lives.

The complexity of today's information systems technology makes it more difficult to identify and protect all the possible access paths to this critical asset. At the same time, today's systems are more critical to every facet of life and business. The combination of these two facts, plus the recent publicity regarding "computer viruses," and the plethora of new software development tools, provide the impetus for renewed investigation into how systems can better be protected.

She then proceeded to relate this to Computer-Aided Software Engineering (CASE): "If CASE tools are to be our primary system software development tools, then they must provide features that enable us to improve the security of the systems being built. Currently, they do not do so, and represent enhanced threats."

Distributed Systems

Security of distributed systems was stressed in his paper *The Digital Distributed System Security Architecture* * by *Donald Holden (USA),* the introduction of which follows:

The state of the art of computer security today allows organizations to implement reasonably secure stand-alone operating systems. Most major operating systems today have incorporated security enhancements to meet commercial system security requirements and certain government requirements. It is also possible to have reasonably secure communications among systems. But computer security for distributed systems has made little progress, and implementing reasonably secure distributed systems has become more difficult. Some reasons for this difficulty include

a. incompatible security mechanisms in different operating systems,

b. little security information exchanged across a network,

c. few useful standards for security interoperability.

Similar concerns, with respect to network security, were expressed by *Mr. Jerome Lobel* (USA), Associate for Information Security, Deloitte & Touche, in *Proactive Network Risk Management.* * In the introduction, he said the following:

Most of the effort that has gone into computer system risk analysis or risk assessment in the past has been directed toward the protection of the host computer environment, including minicomputers and to some extent personal computers. To a larger degree the threats associated with telecommunications have been addressed mainly to assure the protection of host systems from external or communications-assisted attacks. This approach is no longer satisfactory in a world where the network may be in fact the most vulnerable part of the corporate or enterprise information system.

Increasingly we are seeing attacks directed against networks in the form of unauthorized use that results in denial of service or at least an additional cost to legitimate system users. In addition, we are also witnessing more compromises that use networks as the primary vehicle to facilitate various forms of information system disruption. Recent computer virus attacks fall into this category.

Fraud perpetrated through telecommunications of course is not new. What may be new could be an alarming increase in the number and size of the frauds facilitated by an unprecedented growth in network resources and connectivity.

Viruses

Computer viruses received attention in two papers, one of which described viruses in simple terms. *Martin Kratz* (CON) and Peter *Johnston (CDN)* began their paper *Managing the Virus Risk* * with the following tutorial:

What is a computer virus? At its simplest, a computer virus is nothing more than a series of instructions telling the computer to perform a certain function. If this sounds to you suspiciously like the definition of a computer program, you're right — a computer virus is nothing more than a computer program.

It is a computer program, however, with a difference. Just as people may have "hidden agendas" that guide their actions, so can a computer virus. No one would knowingly load a program into their computer that would erase the contents of their hard disk without their explicit permission. A computer virus can, and has done so, in some cases. How can this occur?

Computer viruses have two main functions: the first is to reproduce , and the second is to do "something else." Let's look at these functions one at a time.

We stated no one would knowingly run a computer virus program. To avoid this, the virus is attached to a program that you would run. When you run this program, the virus is automatically run too. When the virus runs, it looks for files it can access.

When the virus finds such a file, it copies itself into that file. If the file is another program, the virus will modify the start-up instructions of the program to run the virus code first the next time the program is executed, then carry on with the normal instructions of the original program. Thus when the program is later ex cuted, the first thing it does (with(the knowledge of the user) is run the computer virus code which looks for places to reproduce itself, and the cycle repeats. A computer virus can be programmed to replicate itself as many times as it can find files to infect. Thus running one infected program can easily infect every application on your hard disk, network or system.

How fast can all this happen? Tests suggest that on an average personal computer, all applications on a hard disk can be infected by a computer virus in two to three seconds. Not only is the infection very rapid within the personal computer, but the propagation rate of infection between the computers and systems is also very rapid. In the case of the MacMag virus, it is estimated that 240,000 Apple Macintosh personal computers were infected throughout the world approximately 21/2 months after the computer virus program had been placed in a

* IFIP

"freeware" package and made available to the public.

Real risk of spread has historically manifested itself through the use of software piracy, software "sharing" arrangements, down-loading programs from bulletin board services and service bureaus, and other use or access to other people's software.

What can a virus do to my system? We have examined the first function of a virus. Now let's look at the second function, the "something else." What this consists of is entirely up to the computer virus developer (we call such people vandals). The "something else" is usually a logic bomb triggered after a specific event or after certain conditions are met. Examples of such conditions are for the "something else" to be activated only after the virus has reproduced itself a certain number of times; only on a computer that has a hard disk attached; only on a computer that has a hard disk more han 75% full; or only on the 13th of onth that is also a Friday or April 1st, etc. The possibilities of the trigger for the logic bombs as well as the contents of the "something else" are limited only by the warped mind of the vandal who developed the virus.

In the analysis which follows, we focus, firstly on reasonable steps that users and computer system managers can take to prevent computer virus infection; secondly, we review the responsibilities of the bulletin board service or computer service bureau operator; and, thirdly, we review the liability of the software vandal and the effect of computer virus contamination on "shareware" arrangements.

Mr. Donn Parker (USA), on the other hand, minimized the threat of the virus in his paper *Seventeen Information Secu,ity Myths Debunked.* * Myth 4 fol-)ws.

Myth 4: Computer viruses are a major business security crisis.

Virus attacks, like Trojan horse attacks and other types of program contamination, are exceedingly dangerous. Nevertheless, since the news media finally ended their intense coverage of viruses around May 1989, experimenters with viruses, who were mostly in universities, appear to have lost interest. A few old contaminated diskettes will cause some minor annoyances from time to time, but serious virus epidemics will be supplanted, in fact and in imagination, by new forms of abuse. Vendors of anti-virus software will close down as their market disappears. Nevertheless, security specialists must remain alert for new forms — or new outbreaks of old forms — of program and computer contamination.

Privacy

Mr. Parker also downplayed the issue of personal privacy in Myth 17.

Myth 17: Increasing computer usage is destroying personal privacy.

Concern about invasion of personal privacy by computers peaked in the early 1970s, culminating in the U.S. Privacy Act of 1974. With the advent of computers, the primary issue became a legislator's dream come true. It was an issue easily understood by the public, easily violated by using computers on a massive scale. However, for the first time in history, a powerful means of protection was at hand if computers were properly used. We can protect, control access to, and preserve the integrity of personal information in computers to a far greater degree than we could protect such information when it was stored on paper in manila folders in file drawers. Today all custodians and users of personal information are sensitized to the privacy issue because of new laws, regulations, codes of conduct, and saturation of the news media with stories about excessive practices. All of this protection has been caused by increasing use of computers for storing and processing personal information.

Therefore, I conclude that increasing computer usage is improving personal privacy, not destroying it.

Wayne Madsen (USA) was not so sanguine. In his paper *Data Privacy: Legislation and Intelligence Agency Threats,* * he discussed several concerns about privacy. Some quotes are given here.

As an example of sensitive personal data, the National Institute of Health in Bethesda, Maryland and the Center for Disease Control in Atlanta maintain large databases on individuals with particular diseases and associated complexes and syndromes. Of particular sensitivity are the databases containing information on individuals with the AIDS virus or AIDS-related complex. Since this data is contained in Federal databases, it is protected in accordance with the Privacy Act of 1974. Although violations of the Privacy Act specify criminal penalties, the Act itself is viewed as generally weak in comparison with more stringent privacy legislation around the world. One must ask therefore whether information such as AIDS data is actually protected or is in fact an open book.

There is a myriad of national laws on the protection of computer data and privacy information. They are diverse in both applicability and enforcement. The role of freedom-of-information acts must be weighed against the advancements in relational database and knowledge-based systems, inference engines, neural networks and artificial intelligence. The exposure of large amounts of open information may synergistically yield sensitive and higher levels of information. One international "yardstick" standard must be developed against which all national and sub-national data privacy laws can be measured. Personal Privacy is a recognized right under the United Nations Covenant on Human Rights. Data privacy should also be recognized as an inalienable part of the overall human dignity of privacy. The threats posed by intelligence agencies, criminals, revenge-seekers, and competitors are too great for data privacy to be ignored.

Mr. Madsen included in his paper a list of 153 nations and the quality of their computer espionage capabilities.

A disheartening note was struck by *Stewart Kowalski (S),* who described the ethical attitudes of a group of computer science students in the paper *Computer Ethics Abuse: A Longitudinal Study of Swedish University Students* * His abstract began as follows.

This paper summarizes the results of a comparison of a 1986 and 1990 self-reporting survey of computer ethical attitudes and computer abuse behavior among Swedish university computer science students. A significant increase between the 1986 and 1990 samples in both questionable/unethical attitudes and computer abuse behavior is shown. In the 1990 study, students who owned personal computers were over-represented in the group of students who had attempted and succeeded at unauthorized access. It appears also that the location where unauthorized access is attempted is shifting from the university to the students' homes and work places.

Computer Detectives

Computer detectives for computer crime were discussed by *Philip Stanley (AUS)* in *Computer-Assisted Investigation of Computer Crime.* * He concluded with this summary:

The Police Forces of the world must perform the first line of investigation into computer fraud cases. Many of these will be large and complex. Recognition that such investigations must be computerised has already occurred. The mainframe computer approach

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Who's Who in IFIP: MR. ROBERT IAU

The ***IFIP** Newsletter* tends to be staid, but we welcome the opportunity to chuckle. The following biography is printed essentially as presented to us by Mr. Iau. — Ed.]

Robert Iau, Secretary-General of the South East Asia Regional Computer Confederation (SEARCC), is a Trustee of IFIP, a member of the Developing Countries Support Committee, and Cognizant Officer of IFIP's Technical Committee on Security and Protection in Information Processing Systems (TC11). He claims that he is in semi-retirement, but he currently holds positions as Chairman of the Advisory Board of the Institute of Systems Science, Chairman of Memorex Telex in Singapore, Chairman of the National Theatre Trust, a Director of British American Tobacco in Singapore, and a Director of Rediffusion.

A 1959 graduate with honours in Economics from the then University of Malaya in Singapore, *Robert* also majored in Chinese Literature. Prior to obtaining his degree, he served as a fighter pilot for 5 years. He attended the advanced Management Programme at the Graduate School of Business at Harvard Business School in Boston in 1979. He also completed his final exams in pianoforte and music theory from the Associated Board of the Royal Schools of Music in England in 1951.

He entered into information processing in 1961, when in service with the social security organisation in Singapore. After becoming chief of EDP in 1966, he decided that it was too much hard work to keep up with the bits and bytes of information processing technology and, accordingly, made the cross-over from pure technology to corporate management. He became chief executive officer of the social security system in 1973.

Somewhere along the way, *Robert* spent time with the Ministry of Defense, where he became the Director of Manpower, responsible for the buildup of the Singapore armed forces, and, concurrently, the head of the Ministry's computer department. He holds the rank of Colonel.

Drifting casually through life, *Robert* became a Director of the Post Office Savings Bank and the Singapore Bus Services, the Managing Director of Singapore Land, and a director of various other companies.

A glutton for punishment, he has served on numerous government boards and committees. He also helped to establish the National Computer Board and assisted in the development of The Singapore National IT Plan.

Robert has been the programme chief for the biennial Singapore Festival of Arts since 1980, a 140,000 ticket event. He claims that this is a purely therapeutic exercise to counter the emotional ravages of technology and big business.

He has received the Singapore government's Public Administration Medal for contribution to the civil service and the Public Service Medal for contribution to the arts.

Robert claims that he founded SEARCC in 1976 by accident. With the encouragement and support of IFIP, he organized and held the first SEARCC regional conference in Singapore in 1976. When the regional national computer societies began clamoring for a permanent forum, SEARCC was born. In 1977, *Robert* brought the case of SEARCC to the IFIP General Assembly (GA) in Toronto. He requested the GA to amend IFIP's statutes to admit regional organisations as full members. To the credit of the GA, it moved with great alacrity, and the 1980 GA approved amendments to the statute which provided for regional grouping, as full members. In 1982, SEARCC was formally admitted as the first regional full member of IFIP.

Robert feels strongly that IFIP's commitment to improving the technological competence of developing countries must be reflected not only in its mission statements but in action. He also feels that developing countries must provide the necessary support structure to allow this to happen. This is why he believes that organisations such as SEARCC are so important in developing the philosophy of self-help.

He has two sons: one is working in a bank and concurrently pursuing a master's degree in banking and finance; the other is a physician.

AC

Robert is an avid reader of books on retirement, an inveterate concert-goer, and the owner of a couple of hot Italian sports cars, which he drives recklessly.■

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may need reconsideration, and decentralised evidence collection and assessment may be more productive.

At the EDP Auditor level, which is the next line of investigation of intrusions not involving money or not able to be proved at the criminal level of proof, the necessary tools must be available. In addition the use of such tools must be understood fully. The mere possession of them will be of little help. Each tool will perform a valuable task, and each has a part to play. Unfortunately there is no multi-purpose tool capable of solving everything. As such the tools are more like a set of golf clubs rather than a tennis racquet, and require a knowledge of when and where to use them.

The use of such tools is not an end in itself but a way of obtaining the essential essence of a case, distilled from all of the confusing data surrounding the key facts. They can never take the place of astute brainpower, but they can help focus brainpower on the major issues.

The computer criminal has many advantages in committing his/her crime, the greatest being the use of the computer in the crime. The investigator has the difficulty of unravelling the crime, often by hand, and piecing together a picture of the perpetrator and his/her methods. In this unequal contest the investigator will lose unless he/she harnesses that power of the computer to his/her task.

The Conference proceedings, edited by *Dittrich, Seppo Rautakivi (SF),* and *Saari,* will be published soon by Elsevier/North-Holland. The next IFIP/Sec is planned for Brighton, U.K. in May 1991.

NEW IFIP PUBLICATIONS FROM NORTH-HOLLAND

Human-Computer Interaction

INTERACT '90
(Proceedings of the IFIP TC13 Third International Conference, Cambridge, UK, August 1990)

edited by **D. Diaper, D. Gilmore, G. Cockton** *and* **B. Shackel**

1990 xl + 1078 pages
Price: US $133.25/D(1.260.00
ISBN 0-444-88817-9

The past decade has seen the growth and diffusion of information technology exceeding most predictions, even those of many optimistic researchers. At the same time, there has also been a substantial increase in concern for the human aspects of computing and information technology systems.

Brought together in this book are 150 papers presenting, discussing and surveying recent research into Human-Computer Interaction. Included are a number of case studies describing a wide range of applications and projects.

Contents:The Efforts of the '80s in Human-Computer Interaction *(G. Cockton).* **Invited Papers: SIOIS —** Standard Interfaces or Interface Standards *(T. Stewart).* Empirical Studies of the Software Design Process *(B. Curtis).*
Foundations. Design: Theories, Methods and Tools. Detailed Design. Interactive Technologies and Techniques. Applications and Case Studies. Doctoral Programme. Panel Sessions.
Author Index. Subject Index.

Modelling the Innovation

Communications, Automation and Information Systems
(Proceedings of the IFIP TC7 Conference, Rome, Italy, March 1990)
edited by **M. Carnevale, M. Lucertini** *and S.* Nicosia

1990 xvi + 594 pages
Price: US $123.00/Dft. 240.00
ISBN 0-444-88565-X

Approving Software Products

(Proceedings of the IFIP WG5.4 Working Conference, Garmisch-Partenkirchen, FRG, September 1990)

edited by **W. Ehrenberger**

1990 xx + 350 pages
Price: US $87.25/Dfl. 170.00
ISBN 0-444-88843-8

Human Factors in Analysis and Design of Information Systems

(Proceedings of the IFIP TC8/WG 8.1 Working Conference, Schärding , Austria, June 1990)

edited by **A. Finkelstein, M. Tauber** *and* **R. Traunmuller**

1990 viii + 240 pages
Price: US $61.50/Df1. 120.00
ISBN 0-444-88285-5

Multi-User Interfaces and Applications

(Proceedings of the IFIP WG8.4 Conference, Heraklion, Crete, Greece, September 1990)

edited by **S. Gibbs** *andA.A.* **Verrijn_Stuart**

1990 x + 390 pages
Price: US $92.25/Df1. 180.00
ISBN 0-444-88760-1

Robotic Systems and AMT

(Proceedings of the IFIP TC5/WG5.3 International Conference on CAD/CAM and Advanced Manufacturing Technology, Jerusalem, Israel, December 1989)

edited by **G. Haley!**

Co-editors: **R.** Weill *andI.* **Yudilevich**

1990 xii + 358 pages
Price: US $92.25/Df1. 180.00
ISBN 0-444-88828-4

Information Network and Data Communication, III

(Proceedings of the IFIP TC6 Third International Conference, Lillehammer, Norway, March 1990)

edited by D. Khakhar *and* **F. Eliassen**

1990 xii + 412 pages
Price: US $97.50/Df1. 190.00
ISBN 0-444-88696-6

Advanced Geometric Modelling for Engineering Applications

Proceedings of the IFIP WG5.2 / GI (Gesellschaft fur Informatik e.V.) International Symposium, Berlin, FRG, 8-10 November 1989

edited by **F.-L. Krause** *and* **H. Jansen**

1990 x + 458 pages
Price: US $112.75/Dfl. 220.00
ISBN 0-444-88830-6

Local Area Networks

(Proceedings of the IFIP TC6 International Conference (INDOLAN '90), Madras, India, January 1990)

edited by **S.V. Raghavan**

990 xx + 316 pages
Price: US $84.50/Df1. 165.00
ISBN 0-444-88761-X

Optimization of Manufacturing Systems Design

(Proceedings of the IFIP WG 5.3 International Conference on Modeling and Simulation for Optimization of Manufacturing Systems Design and Application, Tempe, AZ, USA, November 1989)

edited by **D.L Shunk**

1990 viii + 290 pages
Price: US $74.25/Dfl. 145.00
ISBN 0-444-88564-1

Intelligent CAD, II

(Proceedings of the IFIP TC5/WG5.2 Second Workshop, Cambridge, UK, September 1988)

edited by **H. Yoshikawa** *andT.* **Holden**

1990 xiv + 380 pages
Price: US $89.75/Df1. 175.00
ISBN 0-444-88850-0

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PROBLEM-SOLVING cont. from p. 1

is expended to verify the accuracy, integrity, and completeness of information in present information systems. Information is of low quality when it is incomplete, ambiguous, of unknown accuracy, or flawed in other ways. LQI is often provided by informants who have only partial knowledge, are not always reliable, may be biased, have hidden goals that they want to further, show inventiveness to hide ignorance or embarrassment, or have other failures.

Certainly, the great majority of information circulating in our world is LQI. Today's information technology requires high quality information and is usually incapable of supporting the many applications that would use the largely prevalent LQI. It is anticipated that improvements in hardware, software, and methods will make it possible to process LQI, thereby opening up enormous domains to information technology. Computers must learn to process LQI!.

The Conference will focus on symbolic (not statistical) processing of LQI, with emphasis on problem-solving. It will bring together those who have worked in or are interested in symbolic processing of LQI by computer. At this Conference, the present approaches to processing LQI will be reviewed, and promising future approaches will be presented and discussed. The emphasis of the conference is on problem-solving aspects, but the conference will maintain an interdisciplinary nature.

Prof. Siklóssy is chairman of the International Program Committee, and Dr. *Joel Quinqueton (F)* **and Dr.** *Jean Sallantin (F)* are co-chairpersons of the Organizing Committee. Further information is in the Call for Papers column on page **14.**

WG12.3 plans to facilitate the communication of recent results (including partial results) in the area of problem-solving, to foster inter-disciplinary contacts among specialists in problem-solving from different areas, and encourage exploration of new scientific domains where problem-solving can play an important role. Problem-solving encompasses search techniques, heuristics, theorem-proving techniques, and inference mechanisms.

Membership in WG12.3 will be open to active researchers in problem-solving who are regular participants in the activities of WG12.3. New members will be elected by the current members of the WG. For further information, please contact

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FUTURE IFIP MEETINGS

GENERAL ASSEMBLY AND COUNCIL (and related meetings)

Council	4-8 Mar 91	Barcelona
GA	2-6 Sep 91	Harare, Zimbabwe
GA	before or after IFIP Congress '92	Madrid

TECHNICAL COMMITTEE AND WORKING GROUP MEETINGS*

TC2	Jun 91	Australia
WG2.1	Dec 90	Brussels, Munich, or Amsterdam
	Sep 91	Europe
WG2.3	10-14 Dec 90	Catalina Island, California
	Sep 91	Southern France
WG2.5	mid Sep 91 (with Working Conf.)	Karlsruhe, F.R.G.
TC5	21-22 Jan 91	Rome
WG5.4	15-19 Sep 90 (with Working Conf.)	Munich
WG5.7	2nd week of Nov 91	
TC6	Sep or Oct 90 (with Comnet 90)	Brazil
	or Nov 90	New Delhi
	24-25 May 91 (with AFRICOM 91)	Tunisia
	early Nov 91 (with COMTAP 91)	Sydney
	Mar or Apr 92 (with SEACOM 92)	S.E. Asia—Kasmir
	Sep or Oct 92	Spain (under study)
	Mar or Apr 93 (with DATACOM)	Johannesburg
WG6.5	5 Oct 90 (after MHS'90 Symposium)	Zurich
TC8	Aug 91	Helsinki
WG8.2	Dec 90 (with WG8.2 conf. ICIS 90)	Copenhagen
WG8.4	24-26 Sep 90 (with conf.)	Heraklion, Crete
WG8.5	3rd quarter 90 (with conf.)	Austria
WG10.4	22-24 Feb 91 (with conf. on DCCA)	Tucson, Arizona
	Jun 91	Montreal region
	Jan 92	7
	Jun 92	Massachusetts
	Jan 93	
	Jun 93	Sweden
WG10.5	27 Nov 90	St. Paul de Vence, France
TC12	tentatively, Sep 90 (or Aug 90)	Europe
TC 13	1 Sep 90	Cambridge, U.K.

* Some meetings are scheduled in conjunction with Working Conferences, for which the conference dates are listed.

Will TC and WG chairmen kindly keep the Secretariat advised of the dates and locations of their future administrative meetings and also send a copy of the minutes to the Secretariat.

National Abbreviations Used in Newsletter

A	Austria		Spain	P	Portugal
AUS	Australia		France	RA	Argentina
B	Belgium	GB	United Kingdom	RCH	Chile
BG	Bulgaria		Hungary	S	Sweden
CDN	Canada	IND	India	SEARCC	South East Asia Regional Computer Confederation
CH	Switzerland	IRL	Ireland	SF	Finland
CLEI	Centro Latinoamericano de Estudios en Informatica	J	Japan	USA	U.S.A.
			Norway	ZA	South Africa
D	Fed. Rep. of Germany	NL	The Netherlands		
DK	Denmark				

CALLS FOR PAPERS

WG2.1/TC2 Working Conf. on **Constructing Programs From Specifications**
13-16 May 91, Pacific Grove, California
papers due: 30 Sep 90
contact: Prof. Dr. Helmut Partsch
Faculty for Math. and Computer Science
University of Nijmegen
Toernooiveld 1
NL-6525 ED Nijmegen, The Netherlands

TC8 Working Conf. on **Collaborative Work, Social Communications and Information Systems — COSCIS'91**
27-29 Aug 91, Helsinki
papers due: 1 Oct 90
contact: Prof. Ronald Stamper
Dept. of Information Management
Univ. of Twente
PO Box 217
7500 AE Enschede, The Netherlands
tel: 31 (53) 894 038, fax: 31 (53) 357 456
telex: 44200 THTES NL
e-mail (Bitnet): stamper@henut5
or
Prof. Ron Lee
Dept. of Management Sci. and Info. Systs.
CBA 5.202
Univ. of Texas, Austin
Austin, TX 78712-1175, U.S.A.
tel: **1** (512) 471-5252, fax: 1 (512) 471-3034
telex: 650 171 6540 MCI
e-mail (Arpanet): leer@emx.utexas.edu
(Bitnet): BGZL414@UTA3081

Fourth Intl. Conf. on **Computer Applications in Production And Engineering — CAPE'91**
10-12 Sep 91, Bordeaux
abstracts due: 31 Oct 90
contact: Conference Secretariat CAPE '91
Laboratoire GRAI
351 Cours de la Liberation
33405 Talence Cedex, France
tel: 56 84 30, fax: 56 84 66 44
telex: 549000 FX 57095 GRAILAB

Third TC6 Conf. on **Computer Communications — AFRICOM-CCDC/91**
21-23 May 91, Tunis
papers due: 1 Nov 90
contact: Centre National de l'Informatique
17, Rue Belhassen Ben Chaâbane
1005 - El Omrane - Tunis, Tunisia
telex: 13904 CENINF, fax : 781.862
e-mail : africom@tuniscni.uucp

WG8.3/8.4 Working Conf. on **Support Functionality in the Office Environment**
9-12 Sep 91, Canterbury, England
papers due: 1 Nov 90
contact: Prof. Dr. H.G. Sol
Delft Univ. of Technology
Dept. of Information Systems
P.O. Box 356
2600 AJ Delft, The Netherlands

WG5.3 Intl. Conf. on **Information Technology in Advanced Manufacturing Systems — ITAMS '91**
17-19 Sep 91, Nanjing, Jiangsu, P.R.C.
papers due: 15 Nov 90
contact: Prof. DENG Ziqiong
The Machine Building Dept.
East China Institute of Technology
Nanjing, Jiangsu 210014, **P.R. China**
tel: (025) 432333
ext. 605 (office), ext. 996 (home)
fax: (025) 431622, telex: 34128 EEINJ CN

WG9.1 Working Conf. on **Human Jobs and Computer Interfaces**
26-28 Jun 91, Tampere, Finland
papers due: 15 Nov 90
contact: Pertti Jarvinen
Univ. of Tampere
Dept. of Computer Science
P.O. Box 607
SF-33101 Tampere, Finland
tel: (358)-31-15677
fax (Mt.): (358)-31-134473
telex: 22263 tayk sf, e-mail: pj@ohdake.uta.fi

WG5.4 Working Conf. on **Dependability of Artificial Intelligence Systems — DAISY 91**
27-29 May 91, Vienna
papers due: 30 Nov 90
contact: ICOS Congress Organisation Service
Schleifmuhlgasse 1/14
A-1040 Vienna, Austria
tel. +43/222/587 60 44
fax. +43/222/587 60 59
telex: 133 869 blaw a ■

CHANGES IN IFIP

NEW APPOINTMENTS

GA REPRESENTATIVE

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(succeeding R. Brotto)

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WG10.2 vice-chairman for Japan:
Mr. N. Kawato
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Kawasaki, Kanagawa, Japan 211
tel: 81 (44) 7542661, fax: 81 (44) 7542664
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NEW TC MEMBERS

TC8: Dr. B. Glasson
School of Business
Curtin University of Technology
GPO Box U 1987
Perth 6001, Australia
(succeeding C.H.B. Brookes)
and
M.L. Goyal (IND) (succeeding S.N. Gairola)

TC12: Mr. S. Linnainmaa (SF)

TC13:
Dr. M. Patkin (AUS), Prof. J.A. Pino (RCH)

AFFILIATE MEMBER REPS.

ICCC: Dr. R. P. Uhlig
Northern Telecom World Trade
885 E. Collins Blvd.
Richardson, TX 75081, U.S.A.
tel: 1 (214) 301 7287
fax:1 (214) 301 7887
telex: 6502591777 **MCI**
(succeeding Dr. P.H. Enslow, **Jr.)**

IFORS: Prof. W.P. Pierskalla
The Wharton School
University of Pennsylvania
3209 Steinberg Hall-Dietrich
Philadelphia, PA 19104-6302, U.S.A.

ADDRESS AND OTHER CHANGES

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GA **representative of Australia and past-president:** Mr. A.W. Goldsworthy
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GA **representative of Belgium:**
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B-1050 Brussels, Belgium
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fax:32 (2) 2306785

WG3.4 chairman: Dr. B.Z. Barta
The Inspectorate on Computers in Education
The Ministry of Education & Culture
Haneviim Tower
2 Houri Street
Haifa, Israel

WG7.6 chairman: Prof. **H.-J.** Sebastian
Dept. of Math. & Computer Science
Leipzig University of Technology
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WG7.6 secretary: Dr. R. Wetzel
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tel. 37 (41) 3928586

WG7.7 **chairman:** Prof. P. Kall
fax: 41 (01) 2521162

WG8.3 **secretary:** Dr. Anna Vari
(on sabb. leave)
State University of New York at Albany
Dept. of Policy Research
Milne 300
Albany, NY 12222, **U.S.A.**

WG9.2 secretary: Ms. Diane Whitehouse
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TC11 chairman: Prof. Dr. W.J. Caelli
fax: 61 (7) 2212384
e-mail: w__caelli@qut.edu.au ■

CALENDAR OF EVENTS

(continued from page 16)

Event	Date	Location	Organized by
Work. Conf. on *Training — from CAD to CIM*	8-12 Jul91	Aalesund, Norway	TC3 WG3.4
Fifth IFAC Symp. on *Computer-Aided Design in Control and Engineering Systs.*	15-17 Jul91	Swansea, U.K.	TC5 IFAC
Thirteenth IMACS World Congress on *Computation and Applied Mathematics*	22-26 Jul 91	Dublin	IMACS
Seminar on *Social Citizenship in the; Information Age*	28 Jul-2 Aug 91	Brighton, U.K.	TC9 WG9.2
Work. Conf. on *The Teacher and Computing: Why, What, How and When?*	Jul 91	Norway	TC3 WG3.5
Work. Conf. on *Impacts of Informatics on the Organization of Education*	5 Aug 91	Santa Barbara, Calif.	TC3 WG3.1
Twelfth Intl. Joint Conf. on *Artificial Intelligence — IJCAII '91*	18-23 Aug 91	Sydney	IJCAII
Intl. Conf. *VLSI '91*	20-22 Aug 91	Edinburgh	TC10 WG10.5
Work. Conf. on *Collaborative Work, Social Communication and Information Systems*	27-29 Aug 91	Helsinki	TC8 FIPA
Fifteenth Intl. Conf. on *System Modelling and Optimization*	2-6 Sep 91	Zurich	TC7 IFAC SVI SVOR OeGOR AFCET IFORS
Seventeenth Intl. Conf. *VLDB '91*	3-6 Sep 91	Barcelona	VLDB
Workshop on *Supporting Functionality in the Office Environment*	9-12 Sep 91	Canterbury	TC8 WG8.3 WG8.4
Computer Application in Production and Engineering — CAPE '91	10-12 Sep 91	Bordeaux	TC5/GRAI Lab. Univ. of Bord.
Intl. Conf. on *Information Technology for Advanced Manufacturing Systems — ITAMS '91*	17-19 Sep 91	Nanjing, Jiangsu, P.R.C.	TC5 WG5.3 Metal Cutting Soc. of China
Work . Conf. on *Programming Environments for High-Level Scientific Problem-Solving*	23-27 Sep 91	Karlsruhe, F.R.G.	TC2 WG2.5
Work. Conf. on *Process Planning for Complex Machining with AI Methods*	27-29 Sep 91	Dresden, G.D.R.	TC5 WG5.3
Fourth Workshop on *Intelligent CAD*	30 Sep-3 Oct 91	Ohio	TC5 WG5.2
Work. Conf. on *Shaping Organizations and Shaping Technology*	Sep 91	Gold Coast, Queensland	TC9 ACS
Purdue Intl. Workshop on *Industrial Computer Systems*	21-24 Oct 91	West Lafayette, Indiana	Purdue TC5 WG5.4
Work. Conf. on *Management of Complex One-of-a-Kind Production*	12-14 Nov 91	Bremen, F.R.G.	TC5 WG5.7
Intl. Conf. on *Computers in the Automation of Shipyard Operations and Ship Design — ICCAS '91*	91	Rio de Janeiro	TC5 WG5.6
Work. Conf. on *Programming Environments for Concurrent Systems*	91	7	TC10 WG10.3
Work. Conf. on *Stochastic Programming: Stability and Numerical Methods*	Mar 92	Wendisch-Rietz, G.D.R.	TC7 WG7.7 Humboldt Univ.
Purdue Intl. Workshop on *Industrial Computer Systems*	6-9 Apr 92	West Lafayette, Indiana	Purdue TC5 WG5.4
Work. Conf. on *Stochastic Optimization: The State of the Art*	Apr 92	Havana	TC7 WG7.7 U. of Habana
Eighth Intl. Conf. on *Computer Security — IFIP/SEC '92*	May 92	Singapore	TC11
Seventh Symp. on *Dynamic Modelling of National Economies*	18-20 Aug 92	Beijing	IFAC IFORS IIASA
Seventh World Cong. on *Medical Informatics — MEDINFO '92*	6-10 Sep 92	Geneva	IMIA
IFIP Congress '92 — 12th World Computer Congress	***7-11*** Sep 92	**Madrid**	**IFIP**
ICCC '92	27 Sep-2 Oct 92 .	Genoa	ICCC
Eighth IFIP/IFAC Conf. on *Software for Discrete Manufac. — PROLAMAT*	92	Japan	TC5 WG5.3 IFAC
Workshop on *Geometric Modelling*	92	Budapest	TC5
Ask,)rk. Conf. on *Integration in Production Management*	92	The Netherlands	TC5 WG5.7
Eleventh Intl. Conf. on *Pattern Recognition*	92	The Netherlands	IAPR
Work. Conf. on *Computational Techniques of Stochastic Programming*	Jan–Feb 93	Seregelyes, Hungary	TC7 WG7.7 MTA SZTAKI
Intl. Conf. on *Feature Modelling and Recognition for CAD/CAM Systems*	Feb 93		TC5 WG5.3 AFCET/Micado
Ninth Intl. Conf. on *Computer Security — IFIP/SEC '93*	May 93	Tokyo	TC II
Thirteenth Intl. Joint Conf. on *Artificial Intelligence — IJCAII '93*	29 Aug-3 Sep 93	Chambery, France	IJCAII
Work. Conf. on *Statistical Aspects of Stochastic Programming*	Aug 93	Prague	TC7 WG7.7
VLSI '93	Aug 93	Grenoble	TC10 WG10.5
Workshop on *Large-Scale Stochastic Programs: Applications and Solutions*	Oct 93	Jalata, U.S.S.R.	TC7 WG7.7 Glushkov Inst. of Cybernetics
Twelfth *IFAC World Congress*	93	Sydney	IFAC
Workshop on *Stochastic Methods and Global Optimization*	Mar 94	Lithuania	TC7 WG7.7
IFIP Congress '94 — 13th World Computer Congress	29 Aug-2 Sep **94**	**Hamburg**	**IFIP**
Intl. Workshop on *Expert Systems in Computer Integrated Manufacturing*	94	Kiev	TC5 WG5.3 Acad. of Sci. of Ukraine
World Conf. on *Computers in Education — WCCE '95*	24 Jul 95	U.K.	**IFIP** TC3 BCS
Thirteenth *IFAC World Congress*	96	San Francisco	IFAC

Please see page 13 for schedule of IFIP administrative meetings.

The **IFIP** Secretariat can furnish details of most of the events listed.

CALENDAR OF EVENTS

Event	Date	Location	Organized by
First European Conf. on *VHDL Methods*	4-7 Sep 90	Marseille	WG10.2/10.5 IMT AFCET IEEE Comp. Soc.
Fourteenth Intl. Symp. *on Computer Performance Modelling, Measurement and Evaluation*	12-14 Sep 90	Edinburgh	TC7 WG7.3 BCS Performance Eng. SG
Work. Conf. *on Approving Software Products - ASP90*	17-19 Sep 90	Munich	TC5 WG5.4
Intl. Symp. *on Local Communications Systems Management*	18-19 Sep 90	Canterbury, England	TC6 WG6.4A
Fourth Workshop on *Database Security*	18-21 Sep 90	Halifax, Great Britain	TC11 WG 11.3
Work. Conf. on *Multi-User Interfaces and Applications*	24-26 Sep 90	Heraklion, Greece	TC8 WG8.4 ACM
Work. Conf. *on Low-Quality Information*	24-26 Sep 90	Spa, Belgium	TC 12
Seventh Work. Conf. on *Stochastic Systems and Optimization*	Sep 90	London	TC7 WG7.1
Intl. Conf. on *Information Technology Harmonizing with Society - INFO JAPAN '90*	1-5 Oct 90	Tokyo	IPSJ IFIP IPSC IEEE/ACM
Second Intl. Symp. on *on Message Handling Systems and Application Layer Communication Protocols*	3-5 Oct 90	Zurich	TC6 WG6.5
Purdue Intl. Workshop *on Industrial Computer Systems*	8-11 Oct 90	West Lafayette, Indiana	Purdue TC5 WG5.4
Intl. Conf. *TELEMATICA '90*	12-14 Oct 90	Porto Alegre, Brazil	TC6 SUCESU-RS/TC6
Workshop on *Distributed Systems: Operations and Management*	22-23 Oct 90	Berlin	TC6 WG6.6
Fifth *Jerusalem Conference on Information Technology - JCIT*	22-25 Oct 90	Jerusalem	IPAI **IFIP**
Work. Conf. on *Formal Product Information*	23-25 Oct 90	Amsterdam	TC5 WG5.2/3/6/7/8
Symp. on *Safety, Security and Reliability-Related Computers for the 1990s - SAFECOMP '90*	30 Oct-2 Nov 90	Gatwick Almon, U.K.	IFAC **IFIP** TC5 WG5.4 Safety and Reliability S.
First Work. Conf. on *History of Computing in Europe*	Oct 90	Budapest	**IFIP** History Commission J. von Neumann Soc.
ICCC '90 - Technology for Mass Applications	5-8 Nov 90	New Delhi	ICCC
Open Conf. *FORTE '90*	6-9 Nov 90	Madrid	TC6 WG6.1/Tech. U. of Madrid
Second Conf. on *CAD/CAM and Technology Transfer to Latin America*	19-24 Nov 90	Havana	TC5
Workshop on *Design Environments*	26-27 Nov 90	Charlottesville, U.S.A.	TC10 WG10.2 IEEE ACM
Second Workshop *on Protocols for High-Speed Networks*	27-29 Nov 90	Palo Alto	TC6 WG6.1 WG6.4
Work. Conf. on *The Information Systems Research Arena of the 90s: Challenges, Perceptions, and Alternative Approaches*	14-16 Dec 90	Copenhagen	TC8 WG8.2
Eleventh Annual Intl. Conf. on *Information Systems - !CIS '90*	16-19 Dec 90	Copenhagen	I**CIS IFIP** TC8/SIM TIMS ACM
State-of-the-Art Seminar on *Database Principles and Practice*	90	Pune, India	TC2 WG2.6
Workshop on *Formal Methods in VLSI Design*	9-11 Jan 91	San Juan, Puerto Rico	TC10 WG10.2 ACM
Symp. on *Intelligent Tuning and Adaptive Control*	15-17 Jan 91	Singapore	TC5 IFAC IEEE IMEKO
Second Work. Conf. on *Dependable Computing for Critical Applications*	18-20 Feb 91	Tucson, Arizona	TC10 WG10.4
Fifth Workshop on *High-Level Synthesis*	3-6 Mar 91	Buhlerhohe, F.R.G.	TCIO WG10.5/U. Karlsruhe
Second Symp. *Integrated Network Management '91*	1-5 Apr 91	Arlington, Virginia	TC6 WG6.6 IEEE
Open Conf. on *Modelling in Computer Graphics*	8-12 Apr 91	Tokyo	TC5 WG5.10/U. of Tokyo
Purdue Intl. Workshop on *Industrial Computer Systems*	15-18 Apr 91	West Lafayette, Indiana	Purdue TC5 WG5.4
Intl. Symp. on *Computer Hardware Description Languages and Their Applications - CHDL '91*	22-24 Apr 91	Marseille	TC10 WG10.2
Work. Conf. *Computer Graphics and Education '91*	Apr 91	Barcelona	TC5 WG5.10/Eurographics ACM Siggraph
Workshop on *CAD/CAM Interfaces in Mechanical Engineering*	2-4 May 91	Darmstadt, F.R.G.	TC5 WG5.2 WG5.3 WG5.10
Work. Conf. *on Stochastic Partial Differential Equations*	3-6 May 91	Charlotte, N. Carolina	TC7 WG7.1/U. of N. Carolina
Work. Conf. on *Constructing Programs from Specifications*	13-16 May 91	San Francisco	TC2 WG2.1
Seventh Intl. Conf. on *Information Security - IFIP/ SEC '91*	15-17 May 91	Brighton, U.K.	TC 11
AFRICOM '91 / CCDC '91	21-23 May 91	Tunis	TC6 ICCC
Workshop on *Dependability of Artificial Intelligence Systems - DAISY 91*	27-29 May 91	Vienna	TC5 WG5.4 IFAC AWICS
Workshop *on Computer Software Structures Integrating AI / K BS Systems*	29-30 May 91	Bergen, Norway	TC5 IFAC **IFIP** NFA
Eleventh Work. Conf. *on Protocol Specification, Testing and Verification*	9-12 Jun 91	Stockholm	TC6 WG6.1 SICS
Work. Conf. on *Approximations and Applications in Stochastic Programming*	17-21 Jun 91	Tallinn, Estonia	TC7 WG7.7 IIASA Est. Acad./Blushkov Inst.
Work. Conf. on *Human Jobs and Computer Interfaces*	26-28 Jun 91	Tampere, Finland	TC9 WG9.1
Work. Conf. *on Change-Point Detection*	Jun 91	Vilnius, U.S.S.R.	TC7 WG7.1
Workshop on *Hybrid Expert System in Manufacturing*	Jun 91	Genoa	TC5 WG5.3 CAD/CAM Bolzano

(continued on page 15)

IFIP Congress '92 - 12th World Computer Congress	7-11 Sep 92	Madrid	**IFIP**
IFIP Congress '94 - 13th World Computer Congress	29 Aug-2 Sep 94	Hamburg	**IFIP**

Please see page 13 for schedule of **IFIP** administrative meetings.
The **IFIP** Secretariat can furnish details of most of the events listed.