IFIP newsletter

International Federation for Information Processing

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TC10 Plans State-of-the-Art Seminar in India Next January

At the March **IFIP** Council meeting in New York, the chairman of the I **FIP** Technical Committee on Computer Systems Technology (TC10), **Prof. Egon Hörbst (A),** announced that TC10 would conduct a state-of-the-art seminar in India on computer hardware design. He described how India had requested TC10 to prepare such a seminar back in 1993, but, for a variety of reasons (e.g., lack of funds from Unesco or India and difficulty in communication), little progress had been made. **Prof. Carlos Delgado-Kloos (E),** vice-chairman of TC10, who had been working hard to organize the seminar, was ready to give up. The Council, however, encouraged TC10 to persevere, and **Prof. Hörbst** said that TC10 funds would be used to help support the project. (This is the sort of activity for which the TC Funds are intended.)

Prof. Delgado-Kloos has announced the following (tentative) information about the seminar:

- *tide:* Hardware Specification, Verification, and Synthesis
- *venue:* Bangalore, India
- *date:* January 1996, in conjunction with two conferences: VLSI'96 (3-6 January) and APCHDL'96 (8-10 January)
- *lecturers:*
  - **Prof. Luc Claesen (B)** on SFG-Tracing: A Practical Formal Verification Method and Its Application to Behavioral Synthesis Verification
  - **Prof. Werner Damm** (D) on Formal Verification of VHDL-Based Hardware Designs
  - **Prof. Nikil Dutt (USA)** on High-Level Synthesis
  - **Prof. George Milne (AUS)** on Techniques for Asynchronous Hardware Description and Verification
  - Dr. **P. Subramanyam (USA)** on Design of Embedded Systems
  - **Prof. Ed Clarke (USA)** on Automatic Verification of Sequential Circuit Designs

State-of-the-art seminars were conducted by TC2 (Software: Theory and Practice) in 1989, 1992, and 1994 in Brazil, India, and Macao. Such seminars serve to advance **IFIP's** mission by bringing current scientific expertise to developing countries (during the seminars as well as before and after, when **IFIP** experts visit institutions in the host countries) and producing books or notes that can disseminate knowledge throughout the world. (Royalties from such publications can also help **IFIP** fulfill its mission in developing countries.) It is hoped that the seminars can be held **in** other locations, since the effort required to repeat a seminar is less than that involved in preparing it for the first time.

We wish TCIO great success in this endeavor. ■

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Theoretical Computer-Science Conference Helps Interaction of South America with International Community

byProf. Jozef Gruska ***(SK)*** ***

The conference LATIN'95 (Latin American Theoretical INformatics) was held in Valparaiso, Chile, April 3-7, 1995, in conjunction with the second South American Workshop on String Processing. LATIN'95 continued the tradition started by LATIN'92, organized in Sao Paulo, Brazil. The aim of these conferences is to provide a high-level forum for theoretical computer science research in Latin America and to promote a strong and healthy interaction with the international scientific community. The **IFIP** Specialist Group **on** Foundations of Computer Science (SG 14), by supporting and sponsoring both LATIN conferences, has been strongly encouraging the South American theoretical computer science community to develop a major conference by which it could identify itself.

Some 133 participants from 24 countries attended the conference, 83 of whom were from South America (64 of those from Chile). The rest were predominately from North America and Europe. Funding obtained from UNESCO through **IFIP** helped to make participation possible for quite a few theoreticians from South American countries. Good attendance from both South America and Europe have been very encouraging.

The local arrangements were handled by the Universidad Técnica Federico Santa

- SG14 chairman

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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, which it will forward to the *Newsletter.*

On-Line IFIP Databases

Databases of **IFIP** information (including this *Newsletter)* are available through international computer networks. Access is possible as follows:

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www:
http://www.dit.upm.es/~cdk/org/ifip

Details of how to access the databases can be obtained from the Secretariat.

New IFIP Secretariat Opened Officially in July

*by Mr. Plamen Nedkov (BG) **

The new **IFIP** Secretariat held its "official opening" in Laxenburg, Austria, on 6 July. Approximately 60 people attended the opening ceremony and subsequent events. The celebration was opened, at the Conference Center of the IIASA (International Institute for Applied Systems Analysis), by **Prof. Asbjørn Rolstadås (N), IFIP's** president, followed by welcoming addresses from the Mayors of Baden and Laxenburg and the Director of IIASA. **Prof. Rolstadås** presented an overview of **IFIP** and its activities and thanked all supporting organizations. The Austrian Minister for Science, Research and Arts, **Dr. Rudolf Scholten,** addressed the assembly and formally inaugurated the Secretariat. **Prof. Rolstadås** then read a message of congratulations from **Acad. Blagovest Sendov,** President of the Parliament of Bulgaria and an **IFIP** past president. The representative of UNIDO (United Nations Industrial Development Organization) welcomed **IFIP** to Austria and informed the attendees that that the Industrial Development Board of UNIDO had decided to confer the status of consultant organization on **IFIP.**

Next, **Prof. Heinz Zemanek (A),** an Honorary Member and a past president of **IFIP,** made a presentation: **IFIP** and International Cooperation. This was followed by a demonstration of **IFIP** on the Internet by **Prof. G. Quirchmayr** from the University of Vienna.

The opening celebration continued with refreshments at the premises of the Secretariat. The Administration Manager of the Secretariat, **Mr. Plamen Nedkov (BG),** expressed grateful thanks to all who visited the Secretariat and thanks for the valuable support the Secretariat had received in Austria. Additional welcoming addresses were made by Austrian officials and by the secretary of IFAC (International Federation of Automatic Control, a sister Federation of **IFIP,** with offices in Laxenburg). In the evening, a reception was hosted by **Dr. Scholten.**

Among the participants were senior Austrian officials, representatives of international organizations based in Austria, Austrian representatives to **IFIP** Technical Committees and Working Groups, representatives of academia, representatives of companies that have supported **IFIP** with donations of equipment for the Secretariat, and the following **IFIP** officials not mentioned above: **Prof. Kurt Bauknecht (CH),** President-Elect, **Mr. Graham Morris (GB),** secretary, **Mr. Aage Melbye (DK),** treasurer, and **Dr. Richard Tanaka (USA),** a past president and Honorary Member.

The event was covered by the press in Austria and internationally. ■

• Administration Manager of the **IFIP** Secretariat

Opening ceremony

Gathering following opening

Secretariat entrance

Problems Concerning the IFIP Role in Information Technology in Developing Countries

[We reprint the following excerpts from the speech of **Dr. Mayuri Odedra-Straub (KEN),** former vice-chair of the **IFIP** Working Group on Social Implications of Computers in Developing Countries (WG9.4), delivered at its January conference in Cairo. She raised several significant issues of concern to **IFIP.** — Editor]

One of the most crucial and problematic issue we are facing in organising conferences within WG9.4 is funding — both to organise the conferences and, more significantly, to sponsor the attendance of people from developing countries (DCs). This has been a serious problem ever since we started organising such events 5 years ago, and there have been few signs of improvement over the years. I find it a shame that authors from DCs whose papers have been accepted for presentation are often unable to attend such events because of lack of funds. Their institutes or organisations often don't have the money to sponsor such trips abroad. The same can be said about the organisers of such events. ... Even if registration fees are waived, not many would have been able to attend without support towards their air tickets. Some have argued that one cannot provide everything to speakers from DCs. This may be true for some cases but for majority of the African academics, for instance, whose salaries aren't even sufficient to provide a reasonable standard of living for them and their families, I feel it is asking too much for them "to foot part of their own bill." ...

Involving DC Participants

My main worry is that events such as WG9.4 conferences will turn into yearly events where groups of people from the industrialised countries come together for a few days to be with people with whom they share a common interest — IT (information technology) in DCs — and to have some fun. There would be nothing wrong with this under different circumstances, but in this case I feel it would be more appropriate to involve more people from countries that we are trying to discuss. Maybe it is unwise for many of us who are not in daily contact with the situation in DCs to sit here and discuss the "future" of IT in these countries and dictate or direct what should be done and how it should be done.

Future events should be organised only if sufficient funds are available in advance, with some kind of a written agreement from sponsors. This would make it possible to sponsor authors from other DCs to attend the conferences. Otherwise, I feel there is an urgent need to reassess the benefits of these conferences, and see if there are other, more appropriate, ways of getting groups of people together to discuss issues related to IT for development. (Some of us had thought that this could be done on the WG9.4 electronic-mail discussion list, the bulletin board, but we were proved wrong. There are hardly any worthwhile discussions taking place on that bulletin board. **I** have failed to figure out why this is the case. I don't feel that the cost of phone bills is a major problem, as it is made out to be, because a large number of members connected to the bulletin board are from the industrialised countries.)

Small, Regional Conferences

One option would be to organise more small, regional conferences, to overcome the problem of funds to support travel as well as other problems associated with organising big events. There is interest from several DCs to host future WG9.4 conferences, but none have the funds to organise such an event. Maybe they should be encouraged to hold their own regional conferences, for 30-40 people from the neighbouring countries. As far as international conferences are concerned, I feel we should have only one conference every 2-3 years.

Concerning the quality of work presented at the conferences, I certainly feel that we have made some progress — although there is still scope for improvement — since the first conference held in India more than 5 years ago. ... I feel that future conferences should be more focused on a particular theme. This may help attract people whose interests are more focused, yet beyond the topic of IT in DCs in general....

Another related issue is the low quality of papers from authors in DCs, which is largely very disappointing (though improving). I do not wish to mention all the reasons here, but would like to say that one of the major problems is access to reference material in many DCs. Somehow, all the papers, books, reports, etc. we write about DCs do not appear to be filtering back to these countries. It is not uncommon to find authors referring to outdated material in their papers. I feel that we, as a group, should try to address this issue and look for ways in which we can help out. Even the proceedings of our previous conferences are not easily available in many countries. The widespread distribution of the *WG9.4 Newsletter* has helped the situation slightly, but we need to look for other ways to disperse the literature. A suggestion made last year in Cuba was to set up a database containing all the literature, which could be accessed by whoever was interested in issues related to IT in DCs. The problem is that such databases are inaccessible to a majority of the people in DCs — even those having e-mail access — because of high costs involved in transmitting all those bytes over long distances. I hope that part of this problem will be solved by the relaunch of the Journal *1. T. for Development,* which I am very happy to announce will appear in the spring of 1995. [The first issue appeared in March — Ed.]

I feel that WG9.4 has a serious problem as far as collaboration, communication, and cooperation are concerned, and these need to be urgently addressed. There are just a handful of people — out of the 200 or so members — whom one can call "active." I find this unacceptable, probably calling for a re-assessment of WG9.4, i.e., its aims and scope. WG9.4 should play a more active role in the application of IT in DCs, in the distribution of literature, and in joint research projects. Yet, we can take pride in the *WG9.4 Newsletter,* the size of our membership, and our "successful" conferences. ■

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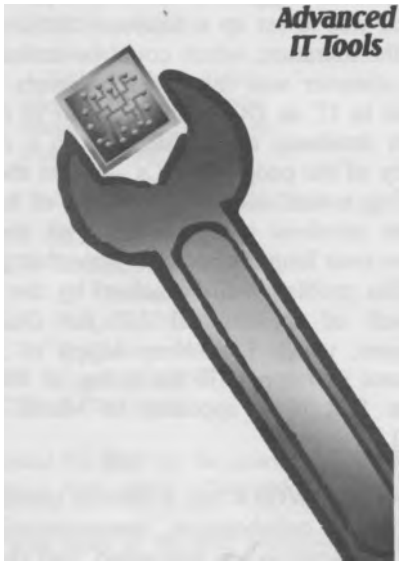
Details Are Announced for the Conferences Comprising IFIP Congress '96

As described in the June 1995 *Newsletter* (page 1), **IFIP** Congress '96 will comprise three world conferences. One of these, Teleteaching '96, was discussed in detail in the June *Newsletter;* we give additional details of the other two here.



The second world conference, Advanced IT Tools, has as its theme Integration of Multimedia-Based Applications and Information Superhighways. Throughout the world, information and communication technologies are providing huge new capacities to human intelligence. This constitutes a resource that changes the way we work together and the way we live together. This large area of new technologies and new applications will be presented in three tracks.

Track 1 is Innovative Applications in the Public Sector. Multimedia and intelligent systems will have a significant influence in many aspects of the public sector. Since the Australian government is located in Canberra, the site of **IFIP** Congress '96, it should provide a fertile forum for advanced applications. Track 2 is Innovative Applications on the Horizon, which will be concerned with turning current technological opportunities into real benefits in the future. Track 3, Intelligent Systems, deals with such systems used for application development, with platforms for these systems, and with intelligent applications.

The chairman of the International Program Committee (IPC) for this conference, **Dr. Nobuyoshi Terashima (J),** received the B.E. and Dr.Eng. degrees from Tohoku University in 1964 and 1979, respectively. In 1964, he joined Denshin Denwa Kosha (now NTT) Laboratories in Musahino, Japan. Since then, he has been engaged in research on operating systems, programming languages, expert systems, and natural-language processing. In 1991, he moved to ATR Communication Systems Research Laboratories as its president.

Dr. Terashima is a member of the Scientific Advisory Board of KTH, Sweden. He is currently concerned with research on intelligent communication systems, including virtual space teleconference systems, and the automation of the development of communication software.

Abstracts of papers for this conference should be submitted by 31 January 1996 to

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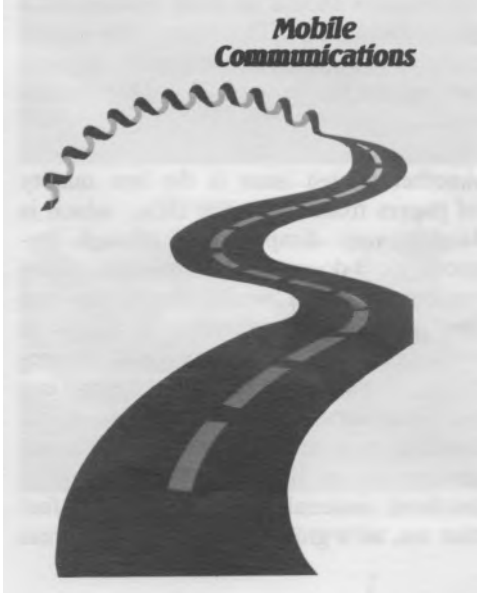

The final world conference, Mobile Communications, has two tracks, the first of which, Mobile Technology, Tools, and Applications, addresses the following questions: What are the challenges in developing mobile computing systems and application software? What are the requirements placed on mobile computing hardware, infrastructure, and communications services? What are the methods and techniques for presentation of and interaction with all types of information and all kinds of media on mobile computing hardware? The benefit of mobile computing devices for the user will be substantially increased if mobile computing devices become part of a greater computing infrastructure, in which mobile computers provide access to information servers connected to networks.

The title of the second track, is "Trusting" in Technology, Authentication, Security. In order to pave the way for the future consumer and business markets in the field of mobile communications, one has to fulfill the requirements of the different actors in this communication world. Some of the prerequisites for the success of new services and products concern the necessity for users, information providers, service providers, equipment providers, and carriers to be able to trust in the new technology.

The chairman of the IPC for this conference is **Prof. Jose Encarnaçã (D),** Professor of Computer Science at the Technical University of Darmstadt, head of its Interactive Graphics Research Group, Chair of the Board of the

Darmstadt Computer Graphics Center, and Director of the Darmstadt R&D Institute of the Fraunhofer Research Society. He serves as a consultant to government, industry, and several international institutions, and was a founder of Eurographics (the European Association for Computer Graphics).

Prof. Encarnaçaô is the author of a large number of papers, the author or co-author of eight textbooks, and editor or co-editor of several books and many proceedings dealing with computer graphics and related applications. He is the Editor-in-Chief of the international journal *Computers and Graphics* and the Managing Editor of the technical book series *Computer Graphics — Systems and Applications.*

Prof. Encarnaçaô holds the Dipl.-Ing. and Dr.-Ing. degrees in electrical engineering from the Technical University of Berlin. He is chairman of the **IFIP** Working Group on Computer Graphics and Virtual Worlds (WG5.10) and a member of the Technical Committee on Computer Applications in Technology (TC5) and the WG on Computer-Aided Design (WG5.2).

Papers for this conference should be submitted by 31 January 1996 to

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Teleteaching 96

Teleteaching '96, the remaining world conference, was described in the June ***IFIP*** *Newsletter*. The chair of the IPC for this conference is **Prof. Sandra Wills (AUS).** She has had twenty years experience in the field of computers and education, from primary through university education, including teacher training and software development. She has been a board member of the Australian Council for Computers in Education since its inception in 1983 and is a Fellow of the Australian Computer Society. She is vice-chair (Asia-Pacific) of the **IFIP** Technical Committee on Education (TC3). In addition to her academic achievements, she has held a number of positions in industry and government, fostering links between industry and education.

Prof. Wills was founding Director of the Interactive Multimedia Learning Unit at the University of Melbourne in 1991. She recently moved to the University of Wollongong to establish Educational Media Services (EMS), which provides a team of experienced educators to advise and manage courseware development for on-campus and off-campus university education. Integrating existing expertise from across campus into one new service, EMS covers all technologies used in the support of educational delivery, including print production, interactive multimedia production, television production, and audio-visual services. EMS is also the host to PAGE, the Professional And Graduate Education consortium of 13 universities.

Suggestions for interactive events for this conference should be submitted by 31 December to

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Broadband Communications Conference to be Held in April in Montreal

Broadband communications is the central, enabling technology for the much-heralded information superhighway, which — apart from being seen as the key to economic prosperity — promises to profoundly change the way we work and play. In response to the challenges faced by designers and users of broadband systems, the **IFIP** Working Group on Broadband Communication (WG6.2) and the U.S. Institute of Electrical and Electronics Engineers (IEEE) Communications Society are sponsoring an international conference on Broadband Communications in Montreal, Canada, 23-25 April 1996. The conference will focus on the leading-edge research being conducted as we enter the era of global connectivity and bandwidth-on-demand. The program will address a range of topics central to broadband communications, with papers on Asynchronous Transfer Mode (ATM) access technology and resource management being stressed.

Previous conferences in this series have been organized by **IFIP** in Estoril, Portugal (1992), and Paris, France (1994).

Prof. Lorne Mason (CDN) is general chair of the conference, and the conference organizers are INRS (Institut National de la Recherche Scientifique) — Telecommunications, and the Canadian Institute for Telecommunications Research. Information about when and where to submit papers can be found in the Call for Papers column on page 15. For further information, one may also submit queries to the address given there. ■

For further information about **IFIP** Congress '96, which will take place 2-6 September 1996 in Canberra, please contact

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Who's Who in IFIP: PROF. BRIAN SHACKEL

"From Classics to Computing in a Random Walk"

[We strive to publish biographies of **IFIP** officers while they are still active in our Federation. For various reasons, however, we sometimes miss the opportunity. **Prof. Brian Shackel,** chairman of the Technical Committee on Human–Computer Interaction (TC13), completes his sixth year in office in 1995 and thus is ineligible for reappointment. Although he will no longer serve as TC13 chair after the September General Assembly in Calgary, he plans to remain active in TC13. Since his biography is enjoyable reading, we print it, more or less as it was given to us. — Ed.]

prof. Shackel, born in Kidbrooke, Kent, England, was one of a fortunate group ordered to go into the British armed services shortly before the end of World War II (in his case, as an RAF navigator) but directed in April 1944 (two months before D-Day) not to report as instructed but to go to the university, where the young men had won scholarships. So he went to Cambridge, graduating in Classics. He then performed deferred national service, spending three happy years as a naval instructor officer, playing cricket, refereeing rugby, and learning how to teach.

After a year as a preparatory-school teacher (while his wife, Penni, completed her training as an occupational therapist), he returned to Cambridge to read Psychology. He then joined the Medical Research Council's Applied Psychology Research Unit in 1952, which led to ergonomics and human factors. In 1954, he founded and built up the Ergonomics Department at EMI Electronics Ltd. (now Thorn–EMI), which still flourishes and is the oldest ergonomics unit in European industry. It was at EMI that he first became involved with computers, and, from 1958 to 1960, he redesigned the operating consoles of both the EMlac analog computer and the EMIdec 2400 digital computer (the largest all-transistor computer in the world at that time).

In 1969, **Prof. Shackel** took up his current post as Professor of Ergonomics at the University of Technology, Loughborough, where he established, in 1970, the HUSAT (Human Sciences and Advanced Technology) Research Centre. This has developed many major research programs, supported by U.K. and European Community funding. HUSAT has a total staff of over 60 and, in 1989, was designated the HUSAT Research Institute — the largest research and consultancy institute in Europe in the field of human–computer interaction. **Prof. Shackel** was also Dean of the School of Human and Environmental Studies (1978-81) and for ten years (1972-82) head of the Department of Human Sciences.

His work in **IFIP** began in the late 1970s in Working Group 6.3 (Man–Computer Communication), which was reconstituted under his chairmanship early in 1981. WG6.3 was transformed into a Task Group on Human–Computer Interaction (HCI) in 1982. The first **IFIP** international conference on HCI, entitled INTERACT'84, was organized under his chairmanship. The status of **IFIP** work on HCI was changed at the 1989 **IFIP** General Assembly, when the Task Group was re-constituted as TC13.

Prof. Shackel has published over 100 papers and several books, including *Applied Ergonomics Handbook* (Ed.), *Man–Computer Communication, Man–Computer Interaction* (Ed.), *Human–Computer Interaction* (Ed.), and *Human Factors for Informatics Usability* (co-Ed.).

He is a Fellow of the British Psychological Society, an Honorary Fellow of the Ergonomics Society, and a Fellow of the Human Factors Society (U.S.A.). His awards include the Distinguished Foreign Colleague Award of the Human Factors Society and the Bartlett Medal (the highest award) of the Ergonomics Society. He has been president of the Ergonomics Society and served in many other capacities in professional societies. He has also consulted for major corporations.

Now that he has retired as Professor Emeritus and is about to retire from the TC 13 chair, he expects to see more of his family. His wife Penni is still a relaxation therapist. His son Nick is a teacher of mathematics, son Julian is an industrial designer, and daughter Francesca is a registered nurse. **Prof. Shackel** hopes now to have more time for his erstwhile hobby of photography, and he wants to explore the WorldWide Web properly. ■

:ATIN'95 continued from page 1

Maria, of Valparaiso. Both the International Program Committee and Organizing Committee were co-chaired by **Prof. Ricardo Baeza-Yates** and **Prof. Eric Goles** from the Universidad de Chile.

The program of LATIN'95 consisted of 38 presentations (selected from 68 submissions) by 131 authors from 22 countries. This demonstrates that the LATIN conference has a well-established international position. In addition, excellent invited talks were given by Professors **Alberto Apostolico (I/USA), Josep Diaz (E), J. Ian Munro (CDN), Isaac Scherson (USA),** and **Mike Watermann (USA).** The program committee consisted of 30 specialists from 14 countries, 10 of them from South America. The orientation of the program was broad, with emphasis on algorithms and complexity issues. Other areas with a large number of papers included parallel and distributed computing, automata theory (especially cellular automata), and the logic of programming.

Design and Analysis of Algorithms

The design and analysis of algorithms is still one of the most active and fruitful areas of theoretical computer investigations and was well represented at LATIN'95. **Prof. Diaz,** in his invited talk, surveyed recent results in one of the hot topics — design of parallel approximation algorithms for NP-complete problems. The basic question is when and how much can parallelism and randomization help. **Prof. Munro** presented a very fine anal-

continued on page 7

IFIP SUPPORTERS

In the June *IFIP Newsletter* (page 5), we listed four companies that had recently provided data processing equipment for the new **IFIP** headquarters in Laxenburg, Austria. Following are brief descriptions of three of the companies, provided by their representatives.

Compaq Computer Corporation

Compaq Computer Corporation is the world's largest supplier of personal computers, offering desktop PCs, portable PCs, and servers.

- Founded in 1982, Compaq sells and supports its products in more than 100 countries through a network of more than 38 000 Compaq marketing partners. These partners include dealers, specialized resellers, network integrators, systems integrators and government systems integrators, value-added resellers, distributors, authorized third-party maintainers, and authorized retailers. In the United States, the company also sells directly through Compaq DirectPlus.

Wholly-owned sales and marketing subsidiaries are located in 34 countries, and manufacturing facilities exist in five countries. The company has over 14 000 employees world-wide.

In 1994, Compaq became the world's Number 1 PC company.

Digital Equipment Corporation

Founded in 1957, Digital Equipment is a leading worldwide supplier of networked computer systems, software, and services. Digital pioneered and leads the industry in interactive, distributed, and multivendor computing. An international company, Digital does more than half of its business outside the United States, developing and manufacturing products and providing customer services in the Americas, Europe, Asia, and the Pacific Rim.

Digital offers a full range of desktop, client/server, production, and mainframe systems for multivendor computing environments. Applications include transaction processing, data management, telecommunications, finance, realtime data acquisition and control, vector processing, education, publishing, manufacturing, software development, and health care.

NEC

NEC was founded in 1899 as the Nippon Electric Company, Ltd., the first joint Japanese venture with foreign capital. Its major products and services are in the areas of communications systems and equipment, computers and industrial electronic systems, electron devices, home entertainment electronics, and household appliances. In the field of communications, NEC manufactures products ranging from cellular mobile telephones to satellite communications and digital switching systems for telephones. In the computer and semiconductor fields, NEC makes a host of products, including supercomputers, mainframes, PCs, distributed systems, high-capacity DRAM and flash memory chips, RISC microprocessors, and color LCD displays.

NEC views "C&C" (computers and communications) as the cornerstone of its activity, striving to help advance societies worldwide toward deepened mutual understanding and the fulfillment of human potential.

NEC employs approximately 150 000 people worldwide, in nearly 90 companies in Japan and 35 companies overseas. ■

LATIN '95 continued from page 6

ysis of fast and space-efficient data structures. **Prof. Joachim von zur Gathen (D)** showed how fast one can perform exponentiation in finite fields, one of the crucial problems in modern cryptography.

Parallel and distributed computing is another hot area in which it is clear that much more theoretical research is badly needed. This area was also well represented at LATIN'95. One of the invited talks, by **Prof. Scherson,** presented progress in one area still not well understood: load balancing in distributed systems. Several papers dealt with cellular automata and neural networks, one of the oldest and, yet, newest areas in which ideas of parallelism have been investigated in various forms. This area is also well represented in Chile, in the group of **Prof. Goles.**

Stringology and text-processing algorithms comprise an old area of research that has acquired a radically new dimension in connection with difficult problems of computational biology. This is another area well represented in South America, especially in Chile, by **Prof. Baeza-Yates** and colleagues. Two excellent invited talks were in this area: **Prof. Apostolico** talked about string statistics problems, and **Prof. Watermann** spoke about difficult and far-from-well-understood problems of probability distributions for sequence alignment scores.

The Future of LATIN

After the first LATIN conference, it was not easy to arrange a successor; however, the situation now seems to be settled. LATIN'97, which will be held in Campinas, Brazil, has already been announced.

An SG14 business meeting was held during the LATIN'95 conference. The main goal was to discuss with representatives of the South American theoretical computer science community what could be done to support fundamental research in South America. Money, of course, is a big problem in that part of the world — but also lack of publishing possibilities, especially in Spanish. The South American theoretical community has been closely tied to either North America or to Europe. Most of their Ph.D.s have studied in those parts of the world. SG14 is greatly concerned with helping this community to find its own identity and place in the world of theoretical computer science.

People in Chile like to emphasize that they live in the most remote corner of the world; however, Chile is a fascinating country that lies on three continents and is trying to make a big leap into the 21st century. ■

TECHNICAL COMMITTEE and SPECIALIST GROUP CHAIRMEN

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SG15:	M. Novak	GB	93-96

TC6 Has Held an International Workshop in Prague on Personal Wireless Communications

An international **IFIP** workshop on Personal Wireless Communications (Wireless Local Access) recently attracted 62 participants to Prague. The workshop, held on 24 and 25 April, was organized by **Mr. Jan Slavik (CZ).** He and **Prof. Otto Spaniol (D),** chairman of the **IFIP** Technical Committee on Communication Systems (TC6), were chairs of the International Program Committee and edited the proceedings. In their preface, the editors outlined the workshop, as follows: *

> Wireless networks have become increasingly popular since the beginning of the nineties. Today, we observe an exponential growth in the number of users as well as in the number of installations. Some experts even believe that the communications market will soon be largely dominated by mobile wireless systems.
>
> The side effects of such over-heated developments are manifold: There is a risk that many incompatible systems will appear, out of which many will eventually fail, whereas others will have enormous problems in interoperating with the "winners" of the competition. Standards will be finalized too late; therefore, severe acceptance problems will be unavoidable. "Toy systems," based on unrealistic assumptions, that are implemented initially could prove to be unsuitable for the much larger user population that is soon to be expected. Precious frequency and transmission capacities could be lost because of poor planning strategies. Finally — but not least important — the security aspects will become particularly obvious and extraordinarily complex in such a broadcast environment. Although this list may look like a nightmare, it is only a partial list of the abundant problems that still have to be attacked (and that will hopefully be solved in the near future).

It Is Time to Act

> There is not much time remaining to deal with all of these complicated aspects, since the wireless systems in question are about to be delivered and/or already existing. Thus, intensive work has been initiated, and this work has to continue with even greater emphasis. That is why the **IFIP** task group on Wireless Communications in **IFIP** Technical Committee 6 on Communication Systems decided to organize a workshop to provide a forum for discussion of all these imminent research and development aspects. It is not difficult to speculate that this workshop will be just the first of a whole series of events dealing with the same area.

The keynote address, written by **Prof. Jens Arnbak (NL)** and **Dr. Jean-Paul Linnartz (NL)** and delivered by **Prof. Arnbak,** was entitled "The European Recipe for Mobile Networking: Technology, Policy, and Markets." We include here a few excerpts that convey the flavor of the talk. *

> In the seventies, the principal design problem encountered in wireless or mobile radio was how to overcome the distortion of received signals by a time-varying and frequency-selective propagation path. Radio waves near the ground do not travel over a single, well-defined radio path as in free space; they are scattered against reflecting obstacles in the vicinity of the mobile antenna. A moving user (e.g., with a vehicular telephone) receives a signal that is rapidly varying in time. This effect is called "fading." Modern digital signal-processing techniques can mitigate these effects to a great extent. As a result, nowadays the most quoted critical issues of wireless systems are no longer directly related to multipath fading, but are
>
> - the scarcity of radio spectrum and the resulting mutual interference among users
> - the power consumption of portable terminals and the inadequacy of existing battery and other energy-storage technologies
> - the complexity of the software needed to support user mobility, e.g., from cell to cell or from operator to operator. ...
>
> In the past ten years, the general emphasis of radio-communications design has shifted away from maximizing the capacity of individual links to optimizing the capabilities of multi-user networks. The decisive interference now seldom comes from outside, but is produced by authorized users of the very same wireless networks. Users thus share an interest in developing and adhering to the best possible protocols and standards for allocating the joint network resources. Accordingly, wireless-systems engineering is developing into a more conscious search for the best common culture for multiple users in a real environment. ...
>
> In the autumn of 1994, 102 operators in 60 countries were committed to GSM (the new standard for Pan-European digital cellular telephony). The networks already in operation had 3 million subscribers, almost half of them in Germany. ...
>
> The benefits of international standards, memorandums of understanding, and mutual roaming agreements for public mobile telephony have caused the annual growth of mobile communications markets to exceed 60% in many countries. No other telecommunications sector can boast similar growth rates at present. The infrastructure supply market is dominated by the few international manufacturers who combine expertise in both radio transmission and national switching systems. The handset market, on the other hand, is subject to the typical supply principles and economics of consumer electronics: short product-development times and "murderous" competition due to the eroding profit margins on microelectronics commodity products since the late 1980s. (Several U.S. operators even provide a free handset as part of a subscription for a certain minimum period of time.)
>
> On January 1, 1995, commercial GSM telephone service was already offered in 16 countries. The major transit routes in Europe had been reasonably covered within one year after the first GSM service went on the air in 1992, despite initial delays in type approval of the first telephone handsets, with their complicated software. ...

Data-Transmission Concerns

> Until very recently, the only possible way in many countries to conduct data transmission over public mobile networks was to attach low-speed, voice-band modems to analog radio telephone circuits. Generally, this results in a poor bit-error rate because of the rapid signal fading and shadowing associated with mobile radio, the interference from adjacent cells, and the frequent handoffs between base stations inherent in systems with moving users. Improvement by the use of suitable error-correcting codes or data-link protocols is possible, but the data throughput of the narrowband radio voice channel remains small.
>
> With the advent of digital GSM, there is a popular belief that mobile corn-

* IFIP

puter communications will become easier, cheaper, and better. While the circuit quality and data rate do indeed improve, a circuit-switched channel (supporting up to 9.6 Kbits/s) is not well suited to any bursty data source, even if using digital transmission. Furthermore, call set-up procedures in GSM, requiring the exchange and sequential processing of about 24 control messages, is prohibitively long for some computer applications. With sufficient error control, digital voice circuits are useful for transfer of batch data such as scheduled up- or downloading of files. On the other hand, dialing up (and paying for!) a real-time two-way circuit between end users is quite inefficient for the more frequent modes of mobile computer communications: electronic mail, interactive access to information services, etc. ...

Despite the many development programs currently under way for universal, integrated, and ubiquitous systems, the ongoing introduction of separate digital networks for mobile telephony and mobile data applications will not come as a surprise to experienced network engineers. In the past, optimum use of classical hard-wired transmission resources motivated separate communications networks and signalling protocols for telephone and computer traffic, adapted to the different statistical characteristics of the corresponding information sources. ...

The concept of Asynchronous Transfer Mode (ATM) could become a viable compromise between circuit and packet-oriented network design. It supports teletraffic at widely ranging rates and burstiness over a guided communication infrastructure. A similar concept for wireless (or "unguided") communication has not yet been developed, although many research programs, including the European Advanced Communications Technologies and Services (ACTS) program, aim to demonstrate wireless access to multi-media services in the period 1994-1998.

Security in Mobile Communications

Another interesting paper, by **Mr. Hannes Federrath, Mrs. Anja Jerichow, Mr. Dogan Kesdogan,** and **Prof. Andreas Pfitzmann,** all from Germany, was entitled "Security in Public Mobile Communication Networks." It raised issues one doesn't normally consider when using a mobile telephone. The paper began as follows: *

The increasing use of mobile communication networks results in ever more stringent security requirements. In an information society, availability, integrity, and confidentiality are essential. The provision of the latter is especially difficult to demonstrate. If the capability exists for some individual or component to gather personal data, one cannot *be sure* that these data are not gathered and misused. But this "being sure" is essential with respect to data protection. Therefore, legal means alone are insufficient and have to be complemented by the technical means we are going to describe. We present data-protection and security requirements, which we believe are the strongest ever presented....

Data to be protected when communicating can be subdivided into *user data* and *switching data.* User data are given to the network to be transmitted. Switching data are needed for connecting sender and recipient. Other data can be derived from user and switching data: for example, data that allow conclusions about who has communicated with whom and for how long. ...

In our opinion, the following requirements should be met for public mobile communication systems intended for broad use:

Protection of Confidentiality
- Message contents should be kept confidential from all parties except the communicating partners.
- The senders and the addressees of messages should stay anonymous to each other [under certain circumstances — Ed.], and third parties (including the network operators) should be unable to observe their communication.
- Neither potential communication partners nor third parties (including the network operators) should be able to locate mobile stations or their users.

Protection of Integrity
- Forging message contents (including the sender's address) should be detected.
- The recipient of message y should be able to prove to third parties that entity *x* has sent message y.
- The sender of a message should be able to prove the sending of a message with correct contents, if possible — even that the addressee received the message.
- Nobody should be able to cheat the network operator(s) of the usage fees. On the other hand, the network operator(s) should be able to collect usage fees only for correctly delivered services.

Protection of Availability
- The communication network enables communication between all parties who wish to communicate (and who are allowed to). ...

In the following, we show how, by technical means, we can not only provide security for the network operator, but provide it for the users of the network as well.

The authors went on to describe their protection schemes. They concluded as follows:

This exposition gives options on how to design public communication networks to technically secure data protection. Furthermore, because of new requirements concerning personal mobility and reachability, existing techniques must be reconsidered and improved. Additionally, new techniques must be developed.

In the phase of standardization of the next generation of mobile networks, there is an opportunity to include these techniques as a solid part of the system. Otherwise, an unnecessarily great effort will be needed to implement data protection afterwards. ...

A Hot Topic

Prof. Spaniol wrote the following summary of the Workshop:

The Workshop theme is one of the "hottest" topics within the area of communication systems. Most presentations were excellent. Discussions were intensive, lively, of high technical quality, and long-lasting. The outstanding events besides the "normal" technical sessions were a really excellent keynote lecture by **Prof. Arnbak** and a panel discussion on the deployment and evolution of the personal handy phone system (a system for pedestrian wireless telephone service in which the size of the radio zone, or cell, is of the order of 100m). The panelists were representatives of seven Japanese firms. According to the participants, it was one of the best panels ever heard.

About a quarter of the delegates came from the Czech and Slovak republics, a quarter from Japan, a quarter from Germany, and the remainder from other countries. Unfortunately, some countries very experienced with respect to wireless communications were not represented at all.

In order to maintain a low registration fee (not more than 120 Swiss francs,

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Corruption and Computerization in Developing Countries

*by Dr. Richard Heeks (GB) **

[The following material is extracted from an article that appeared in the newsletter of the **IFIP** Working Group on Social Implications of Computers in Developing Countries (WG9.4). We believe it will be of interest to the entire **IFIP** community. — Editor]

Corruption (inducement to wrong by bribery or other unlawful or improper means) is a global problem. The focus of this article is on corruption related to computerisation within the public sector in developing countries. In choosing this focus, we recognize, of course, that other sectors and countries have corruption problems, and that much of the corruption in state organisations of developing countries involves payments from the private sector and from other countries. ...

In the research on computerisation and corruption, one obvious interest is to understand whether computerisation — for example, through improved control mechanisms — might help to reduce or even eliminate corruption. Some thumbnail sketches are offered below to help provide initial pointers to an answer. They are drawn from the author's personal experience and from the direct experiences of study fellows at the University of Manchester's Institute for Development Policy and Management.

Is the Computer Responsible?

Case 1: An Asian customs department kept manual records with the names and addresses of overseas firms that had been involved in import or export transactions. These contacts were useful to local entrepreneurs, particularly those seeking export collaborations. The entrepreneurs, therefore, paid customs officials illegally to provide them with the contact details. The department, including its details of overseas firms, was computerised, and one computer was put into a front office, where members of the public could access it. Entrepreneurs gained direct access to the contact details they wanted; therefore, payments were no longer made. ...

Of course, this had little to do with computerisation. The department could have made its manual records publicly accessible, leading to a similar result. Thus, when looking at computerisation and change, one must take care to disentangle the impact of computers and the impact of simultaneous organisational change.

New Corruption

Case 2: In an African public works department, there was concern about the number of "ghost workers" (people listed on the payroll, and therefore paid, who do not exist in reality; someone else collects the wages paid out under their names). The payroll system was computerised, and, during this process, a check was made between listed and actual workers. Any non-existent staff were removed from the system.

This seemed to have solved the problem, assisted by the word being spread that the computer could make an automatic check between the payroll list and reality and could automatically detect who was picking up ghost-worker wages. Of course, it could do no such thing, and an audit 18 months later uncovered a very well-to-do computer operator who was collecting his own wages plus those of thirty other workers he had entered into the payroll system.

Two points emerge from this. First, as in the previous case, computerisation had little to do with the removal of ghost workers and the consequent (temporary) removal of corruption. This required a physical check, as was done both before and after computerisation. Second, computerisation did change things by altering the set of people with the skills, confidence, and access to undertake this type of corrupt activity. Many of the ordinary staff were frightened from attempting this form of corruption by a mistaken perception of the computer's powers (quite possibly spread by the computing staff). Those with IT (information technology) skills saw a wonderful new opportunity emerging as a result of computerisation.

Resisting Computerisation

Case 3: Examination marks at an Asian university were previously kept on paper, with calculation of final grades and averages done manually by a small group of trusted staff. Mark lists were kept locked in a safe when not being used. Because of the large number of students, it was decided to computerise the marks and calculations. There was an assumption that information on the (un-networked) computer would be safe, though a password, known to only a very few staff, was added just in case.

All seemed well until one lecturer noticed that a relatively dull student had achieved a spectacular final grade. Enquiries revealed that he was the son of one of the computer managers. The manager, knowing the importance of university grades for job prospects, had opened up the marks files and changed his son's mark. Unfortunately for him, instead of altering the figures slightly, he got over-ambitious and pushed them from the 40s up to the 70s.

This case more or less reinforces the point made earlier. Computerisation may open up new corruption opportunities, particularly by altering who has access to information, and it may also alter the skills necessary to indulge in corruption.

Where There's a Will...

Case 4: Managers **in** an Asian railway system were concerned about the efficiency of its seat/berth reservation system and about corruption within the system. Booking staff had access to and control over the allocation of places on trains, and a few would take bribes (either directly or via ticket "touts") for providing passengers with reserved places, these being at a premium, since all trains were overbooked. A computerised system was introduced, one objective of which was to eliminate corruption. To achieve this, allocation of reservations was handled automatically.

Computerisation did make it harder for the clerical staff to be corrupt, because the software, not the clerk, now decided — on the basis of booking date — which passengers would fill vacated slots. However, corruption was not eliminated. First, station managers retained manual control over a certain proportion of the train places, supposedly to cover emergencies or last-minute travel by VIPs. Some continued to provide these places to non-emergency, non-VIP passengers in return for cash. Second, ticket touts showed how ingenious and resourceful they can be. Knowing that their best customers were businessmen in a hurry, they would book places well in advance on the main inter-city trains. ...

Here, some of the more powerful system stakeholders ensured that their discretionary powers were not computerised. To some extent, this was part of the process of getting computerisation accepted: it was only able to proceed once the decision was reached that it would not threaten these

* Regional correspondent for WG9.4

stakeholders' control and private incomes. Indeed, by removing sources of competition for corrupt earnings from the clerical staff, it offered an opportunity for station managers' incomes to be increased. This case also shows from the example of the touts that if the motivation to be corrupt is present, human beings will almost invariably find a way to "beat the system."

More Resistance

Case 5: Computerisation was taking place in two African universities, and it seemed obvious to turn its attention to the admissions process, which was notoriously slow and corrupt. Computerisation of admissions typically involves producing a prioritised list, headed by the candidate with the best overall marks. This clearly represented a considerable threat to members of the admissions committees, who can gain significant financial and political rewards by offering admission to the sons and daughters of the rich and powerful, who would not get into university if an entirely merit-based system were adopted.

The two committees adopted different approaches. In the first university, a decision was made that "computerisation of admissions would not improve organisational efficiency," and things continued as they were. In the second, computerisation did take place, but the prioritised list was accepted merely as an "advisory tool" for the committee, and was never made public outside that committee.

These cases reinforce the earlier point that where powerful stakeholders are involved, they will devise ways to ensure that computerisation does not threaten their powers or incomes. They do this by keeping certain information or processes away from the computer. In the first case here, this was done by preventing computerisation, while in the second it involved computerisation of some aspects, but not the critical process — that of actually making the admissions decision.

Conclusions

Two principal outcomes are seen from the cases above. In some cases, computerisation leaves corruption unaffected, because it occurs in such a way that the key corruption-linked resources or processes are left uncomputerised, despite their possibly being surrounded by other computerisations. In other cases, computerisation does alter corruption by changing what people it is who have access to and control over valuable resources, especially information, and/or by changing the skills required to be corrupt, typically "upskilling corruption" by providing corruption opportunities only to those with IT skills. ...

Of course, access, control, and skills are necessary, but not sufficient, conditions for corruption to take place. People must also have the motivation to be corrupt and the confidence that they will not be caught or punished. Computers are unlikely to affect underlying motivations, but they can affect confidence. The promotion of a mythical image of the computer as an "objective, all-seeing, all-doing machine" may cause some corrupt staff to lose confidence and refrain from corrupt practices — though perhaps only temporarily, until they attend their first IT-awareness course!

Overall, then, if it leads to any changes at all, computerisation provides new corruption opportunities for some groups and closes down or requires alteration of corruption routes for other groups. These changes, particularly the threat of a reduction in corrupt incomes, are likely to have a significant impact when new computerised information systems are planned in the presence of corrupt practices....

It is clear that the link between computerisation and corruption will have to be recognised in the planning of some information systems, and must be drawn out as a component of resistance to computerisation.

Two Types of Corruption

Aside from the "corruption of opportunity," such as that which arose in the payroll case, two particular types of corruption can be distinguished. There is the "corruption of necessity" practised by poorly-paid, low-level officials. Their incomes do not meet the many demands placed upon them, and they must find ways of supplementation. Computers may suppress some of their activities but will not extinguish the underlying drive for additional income. Thus, corruption is almost bound to re-emerge.

Alternatively, there is the "corruption of greed" practised by senior staff. They have enough income to live on, but they want and get more because they are in a position to do so and because it is seen as a natural activity for those in power. Given the power of these staff to determine their working environment, computerisation is unlikely to be allowed to have much impact unless imposed by a very strong external agency. ...

In very simplified terms, computerisation affects symptoms of a corrupt system rather than causes. Corruption is a phenomenon rooted in the cultural, political, and economic circumstances of those involved. Computerisation does little to affect these root causes, and so cannot eliminate corruption.

In writing up the cases above, I was struck by how easily such descriptions can degenerate into the realm of gossip and hearsay. There is, therefore, clearly a need for more in-depth case studies dealing with the issue of computerisation and corruption. ... If readers are aware of such studies, or know of cases in which computerisation and corruption interact, please contact the author at the following address:

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e-mail: richard.heeks@man.ac.uk

All contacts will, of course, be treated confidentially. ■

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.

National Abbreviations Used in Newsletter

A	Austria	DK	Denmark	N	Norway
AUS	Australia	E	Spain	NL	The Netherlands
B	Belgium	GB	United Kingdom	S	Sweden
BG	Bulgaria	I	Italy	SF	Finland
CDN	Canada	IL	Israel	SK	Slovakia
CH	Switzerland	IRL	Ireland	USA	U.S.A.
CZ	The Czech Republic	J	Japan	ZA	South Africa
D	Germany	KEN	Kenya	ZW	Zimbabwe

TC10 Holds Annual Meeting in Great Style in Munich

*by Mr. Ron Waxman (USA) **

The annual meeting of the **IFIP** Technical Committee on Computer Systems Technology (TC10), hosted by Siemens in Munich-Neuperlach, Germany, was held March 14-15, 1995. The meeting was well attended by the national representatives from 11 countries, leaders of 3 of the TC Working Groups, and guests. Notable among the guests 'was **Prof. Robert Piloty (D),** who founded TC10 in 1977.

Some items addressed by the meeting attendees included a report from **Prof. Egon Hörbst (A),** the TC chairman, on the healthy status of the TC, Aims and Scope of the TC, plans for future activities, Special Interest Groups, budget, and membership. A major discussion topic was **IFIP** Congress '96 (**Prof. Hörbst** is co-chairman of the International Program Committee (IPC)). The general feeling was that the inclusion of TC chairs in the IPC is an important and beneficial step to help develop the conference program. [For further information, see the article about the Congress on page 4. — Ed.] A second major topic dealt with the new publication agreement with Chapman & Hall, under which an attempt will be made to have final conference publications (in the form of books and/or CD-ROMs) available at the conferences. Discussion of the new TC10 Special Interest Groups (SIGs) was also lively. There are two SIGs within the TC10 Working Group on Design and Engineering of Electronic Systems (WG10.5). This WG was newly formed by a merger of former WGs 10.2 and 10.5. The new SIGs are on VHDL and Codesign. The expectation is that the SIGs will contribute much to the vitality of the TC and to **IFIP** in general.

* U.S. representative to TC10

Festive Dinner

The attendees and guests at the meeting were hosted for a festive dinner the night of March 14 by Gesellschaft flit Informatik (GI), the German Member of **IFIP,** with **Dr. Hermann Rampacher,** director of GI, and **Prof. Wilfried Brauer (D), IFIP** vice-president, acting for **IFIP.** The invited guests were **Prof. Piloty** and **Prof. Friedrich Bauer (D),** former representative from Germany to the **IFIP** General Assembly and TC2. The dinner was held at the castle of Kaltenberg, owned by **Prince Luitpold** of Bavaria, located near Munich. The Prince arrived during dinner to address the dinner party, and stayed to speak with several of the attendees and enjoy the festivities.

Musical Accompaniment

The dinner, arranged by **Prof. Hörbst,** was accompanied by a small group of musicians playing various stringed instruments from the locality and by a Bavarian band composed of various kinds of horns and drums. The band greeted the TC10 group at the entrance to the castle and led them down a road to the castle, where the group was escorted through the Prince's brewery, located under the castle, and then to dinner. The photograph on this page shows **Prince Luitpold** and **Prof. Piloty,** as the latter points to a portrait of King Ludwig of Bavaria, who lived some 150 years ago. The portrait was painted by the great-grandfather of **Prof. Piloty,** who was a famous painter in Ludwig's time. As the evening ended, the band sent the party up the road to their waiting bus to the sound of more wonderful music.

The second meeting day included a tour of Siemens' research facilities and a visit to the German Technical Museum in Munich. **Prof. Bauer,** who played a major role in the development of the new section of the museum dealing with computers and computation, guided the TC 10 group through that section and provided fascinating commentary.

Professor Piloty (left) and Prince Luitpold.

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Logic and Architecture Synthesis
July 1995: c.370: 100 line illus: Hb: 0-412-72690-4: c.£49.50

Open Distributed Processing
K Raymond and L Armstrong
July 1995: c.640pp: 100 line illus: Hb: 0-412-71150-8: c.£60.00

Performance Modelling and Evaluation of ATM Networks - Volume 1
D Kouvatsos
July 1995: c.600pp: 100 line illus: Hb: 0-412-71140-0: c.£79.00

Protocol Specification, Testing and Verification XIV
S T Vuong and S T Chanson
November 1994: 416pp: 145 line illus: Hb: 0-412-63640-9: £50.00

Protocol Test Systems
T Mizuno, T Higashino and N Shiratori
June 1995: c.368pp: 100 line illus: Hb: 0-412-71160-5: £55.00

Protocols for High Speed Networks IV
G Neufeld and M Ito
March 1995: c.384pp: 150 line illus: Hb: 0-412-71180-X: £50.00

Re-engineering the Enterprise
J Browne
September 1995: c.320pp: 4 line illus: Hb: 0-412-64260-3: c.£45.00

Reliability and Optimization of Structural Systems
R Rackwitz, G Augusti and A Borri
May 1995: c.324pp: 150 line illus: Hb: 0-412-63630-1: £50.00

Simulation Games and Learning in Production Management
J 0 Riis
May 1995: c.208pp: 50 line illus: Hb: 0-412-72100-7: £49.00

Software Quality and Productivity
Theory, practice, education and training
M Lee, B Z Barta and P Juliff
December 1994: 416pp: 45 line illus, 5 halftone illus: Hb: 0-412-62960-7: £56.00

System Modelling and Optimization
J Dolezal
February 1996: c.960pp: Hb: 0-412-71880-4: c.£85.00

World Conference on Computers in Education
D Tinsley and T van Weert
July 1995: c.960pp: Hb: 0-412-62670-5: c.£95.00: CD-ROM: 0-412-71460-4: c.£79.00

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Education and Information Technologies

AIMS AND SCOPE

Education and Information Technologies, edited by **Mr Brian Samways** and **Dr Betty Collis** will be a refereed quarterly journal publishing papers from all sectors of education on all aspects of information technology and information systems. Subjects which are indicative of the changes in the methods of teaching and learning will be addressed by the journal as well as examples of good practice and innovative ideas

AN ESSENTIAL NEW JOURNAL

Education and Information Technologies will be of interest to both experienced professionals as well as those relatively new to Information Technology. It is specifically intended for teachers and trainers, informatics specialists, policy makers, curriculum designers, vendors, vocational trainers and academics. In addition, it will appeal to people involved at all levels from elementary and primary through secondary to tertiary and vocational education.

AN INTERNATIONAL PUBLICATION ADDRESSING ALL ASPECTS OF EDUCATION AND INFORMATION SYSTEMS

New technologies have the ability to liberate the learner and the teacher enabling their time to be used more efficiently. The need for a publication to address the subsequent issues which have arisen as a result has led to the timely creation of **Education and Information Technologies.** In addition to more efficient learning, information systems can improve and extend channels of communication making dialogue within the community easier. **Education and Information Technologies** will offer a vibrant forum for good experiences to be shared.

THE JOURNAL OF IFIP TECHNICAL COMMITTEE 3 ON EDUCATION

This group will ensure that appropriate papers from TC3 Working Group Conferences are seen by a wider audience. It also offers those outside IFIP who are in the forefront of development, a platform from which to share their ideas with the international community, and thus provide insight and analysis of policy and practice for decision and policy-makers.

RELEVANT SUBJECT TOPICS INCLUDE:

*Computer Literacy *Teaching about Computing and Computers throughout the Educational Process *Computing in the Workplace *Information Technology in Schools and Continued Learning *Tools and Techniques of Educational Computing, including expert Systems and AI *Educational Computing Networks *Communication and Telematics *Flexible and Distance Learning *Integration of IT into Education and Training *Educational Software & Hardware Infrastructures *Equity and Social Issues

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CALENDAR OF EVENTS

(continued from page 16)

Event	Date	Location	Sponsored by
Work. Conf. on *Place of Information Technology in Management Education*	8-12 Jul 96	Melbourne, Australia	**IFIP** WG3.4 Deakin U.
Fourteenth ***!FORS*** *World Congress*	8-12 Jul 96	Vancouver, B.C., Canada	IFORS
IFIP Congress '96 — Fourteenth World Computer Congress	**2-6 Sep 96**	**Canberra, Australia**	**IFIP**
Open Conf. on *Formal Description Techniques and Protocol Specification, Testing, and Verification — FORTE/PSTV'96*	24-27 Sep 96	Kaiserslautern, Germany	**IFIP** WG6.I
Work. Conf. on *Mathematical and Scientific Computing: Quality of Numerical Software*	96	Oxford, U.K.	**IFIP** WG2.5
Fourteenth ***IMEKO*** *World Congress*	2-6 Jun 97	Tempaere/Helsinki, Fin.	IMEKO
IFIP Congress '98 — Fifteenth World Computer Congress	**23-29 Aug 98**	**Vienna, Austria, and Budapest, Hungary**	**IFIP**

The **IFIP** Secretariat can furnish details of most of the events listed. For a schedule of **IFIP** administrative meetings, please see the list below.

FUTURE IFIP MEETINGS

GENERAL ASSEMBLY AND COUNCIL (and related meetings)

GA	6-10 Sep 95 (Wed.–Sun.)	Calgary, Alberta, Canada
Council	3-7 Mar 96 (Sun.–Thurs.)	South Africa
GA	(contiguous to **IFIP** Congress '96)	Canberra, Australia
GA	(contiguous to **IFIP** Congress **'98)**	Vienna, Austria, or Budapest, Hungary

TECHNICAL COMMITTEE AND WORKING GROUP MEETINGS

WG2.1	23-27 Oct 95	Ulm, Germany
	June 96	Western U.S.A.
WG2.2	Sep/Oct 96	Macao
	97	Graz, Austria
WG2.4	20-24 May 96	Ameland, The Netherlands
	Jun 97	Berlin, Germany
	98	Colorado, U.S.A.
WG2.5	23-25 Oct 95	Kyoto, Japan
WG2.6	23-25 Oct 95	Barcelona, Spain
WG2.7/13.4	15-18 Apr 96	Vancouver, BC, Canada
WG2.8	18-22 Sep 95	Lake Aspenes, Sweden
WG2.9	second quarter 96	Northwestern U.S.A.
TC3	Aug–Sep 96	Canberra, Australia
TC5	10 May 96	Trondheim, Norway
WG5.4	28 Nov 95	Berlin, Germany
WG5.l I	Nov–Dec 95 (with IFIP/IFAC conf.)	Queensland, Australia
TC6	15-16 Sep 95	Palma, Spain
	26-27 Apr 96	Montreal, Canada
	6-7 Sep 96	Australia
TC8	12-13 Apr 96	Tucson, AZ, U.S.A.
WG8.2	7 Dec 95	Cambridge, U.K.
	Dec 96 (with ICIS)	Cleveland, OH, U.S.A.
	Dec 97 (with ICIS)	Atlanta, GA, U.S.A.
WG9.2	Jan 96	Namur, Belgium
WG9.6	14-15 Sep 95	Farnham, U.K.
	9-10 Mar 96	Hamburg, Germany
WG10.2	95 (with conf.)	U.S.A.
TC12	Sep 95	Wroclaw, Poland
WG12.2	3-6 Jul 96 (with ICML96)	Bari, Italy
TC13	14 Apr 96	Vancouver, BC, Canada
WG13.1	16 Apr 96	Vancouver, BC, Canada
WG13.2	13 May 96 (during working conf.)	Geneva, Switzerland
WG13.3	10-13 Oct 95 (with EART 3 conf.)	Lisbon, Portugal
WG13.4/2.7	15-18 Apr 96	Vancouver, BC, Canada

This information is furnished to the *Newsletter* by the Secretariat. 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. Some meetings are scheduled in conjunction with Working Conferences, for which the conference dates are listed.

WIRELESS COMMO. cont. from page 9

including all meals as well as an evening social event), it was decided not to produce "normal proceedings." Instead, a book was printed by a small German publisher, who offered the best financial arrangement. These proceedings can be obtained from

Augustinus Buchhandlung
Pontsrasse 96
D-52062 Aachen, Germany
tel. and fax.: +49-241-23948

We were extremely glad that there were no problems with no-show authors. All authors were present! An article on page 10 of the March ***IFIP Newsletter*** addresses the problem of "no-show authors." — Ed.]

CALLS FOR PAPERS

IFIP WG6.2–IEEE Work. Conf. on
Broadband Communications '96 — BB'96
23-25 Apr 96, Montreal, Canada
e-mail: bb96@inrs-telecom.uquebec.ca
papers due: 31 Oct 95
contact: Prof. Lorne G. Mason
INRS-Telecommunications
16 Place du Commerce
Verdun, Quebec, Canada, H3E 1H6
tel: +1 (514) 765-7836, fax: +1 (514) 761-8501

IFIP Congress '96
2-6 Sep 96, Canberra, Australia
Please see the article on page 4 for information concerning submitting papers to the three conferences that constitute **IFIP Congress '96.**

Will event organizers please note that calls for papers cannot be listed in this column until the events have been approved by **IFIP.**

CALENDAR OF EVENTS

Event	Date	Location	Sponsored by
Intl. Conf. on *Computer Hardware Description Languages and Their Applications — CHDL'95*	29 Aug-- I Sep 95	Makuhari, Chiba, Japan	**IFIP** WG10.2/10.5 et al.
Intl. Workshop on [illegible]	4-6 Sep 95	Evry, France	**IFIP** TC6
Intl. Symp. on *Operations Research — SOR'96*	4-6 Sep 95	Braunschweig, Germany	DGOR, **IFIP** WG7.4
Work. Conf. on *Managing Concurrent Manufacturing to Improve Industrial Performance*	11-15 Sep 95	Seattle, WA, U.S.A.	**IFIP** WG5.7
Sixth Conf. on *High Performance Networks — HPN'95*	11-15 Sep 95	['al]ma de Mallorca, Spain	**IFIP** WG6.4
Work. Conf. on *Communications and Multimedia Security*	20-21 Sep 95	Graz, Austria	**IFIP** TC6 TCI I Austrian Comp. Soc.
Joint Intl. Conf.: *Modelling Techniques and Tools for Computer Performance* and *Measuring, Modelling, and Evaluating Computing and Communication — PT'95/MMB'95*	20-22 Sep 95	Heidelberg, Germany	GI **IFIP** WG7.3 et al.
Workshop on *Hardware/Software Codesign*	22-23 Sep 95	3righton, U.K.	**IFIP** WG10.5, SIG-CODES
Fifth Work. Conf. on *Dependable Computing for Critical Applications — DCCA-5*	27-29 Sep 95	Urbana , IL, U.S.A.	**IFIP** WG10.4, TCI I IEE TC-FTC EWICS U. III.
Eighth Symp. on *information Control Problems in Manufacturing — INCOM '95*	4-8 Oct 95	Beijing, China	IFAC IMACS IFORS ISPE **IFIP**
Workshop on *Software Engineering Data — IWSED'95*	9-11 Oct 95	College Park, MD, U.S.A.	**IFIP** WG5.4, IEEE
Intl. Conf. on *Computer Safety, Reliability and Security — SAFECOMP'95*	11-13 Oct 95	Belgirate, Italy	**IFIP** WG5.4 EWICS TC7 *et al*
Work. Conf. on *Diffusion and Adoption of Information Technology*	14-17 Oct 95	Oslo, Norway	**IFIP** WG8.6
Sixth Intl. Workshop on *Distributed Systems: Operations and Management — DSOM'95*	16-18 Oct 95	Ottawa, Canada	**IFIP** WG6.6 IEEE CNOM
Eighth Open Conf. on *Formal Description Techniques on Distributed Systems and Communication Protocols — FORTE '95*	17-20 Oct 95	Montreal, Quebec, Canada	**IFIP WG6.I**
First Workshop on *Knowledge-Intensive CAD — KIC-1*	Oct 95	Helsinki, Finland	**IFIP** WG5.2
Work. Conf. on *Models and Methodologies for Enterprise Integration — El95*	8-11 Nov 95	Heron Island, Queensland, Australia	**IFIP** TC5 (SIG on Architectures for Enterprise Integration)
Intl. Work. Conf. on *Upper Layer Protocols, Architectures and Applications — ULPAA '95*	6-8 Dec 95	Sydney, Australia	**IFIP** TC6 WG6.5 et al.
Work. Conf. on *Information Technology and Changes in Organizational Work*	7-9 Dec 95	Cambridge, U.K.	**IFIP** WG8.2
Intl. Workshop on *Stochastic Optimization*	17-19 Jan 96	Tucson, AZ, U.S.A.	**IFIP** WG7.7
Third Intl. Conf. on *Achieving Quality in Software — AQuIS'96*	24-26 Jan 96	Florence, Italy	**IFIP** WG5.4
Intl. Conf. on *Distributed Platforms — 1CDP '96*	27 Feb — I Mar 96	Dresden, Germany	**IFIP** WG6.1 RWTH Aachen et al.
Symp. on *Industrial Benefits and Advances in Formal Methods — FME'96*	17-22 Mar 96	Oxford, U.K.	Comm. of European Comm., **IFIP** WG14.3
Work. Conf. on *Impact of Information Technology from Practice to Curriculum*	18-21 Mar 96	Neve-Ilan, Israel	**IFIP** TC3, TC9/WG9.5
Work. Conf. on *Software Engineering and CASE Tools for Control Technology of Manufacturing Systems*	28-29 Mar 96	Stuttgart, Germany	**IFIP** WG5.3
Seventh Work. Conf. on *Reliability and Optimization of Structural Systems*	2-4 Apr 96	Boulder, CO, U.S.A.	**IFIP** WG7.5, Univ. of Col., Tech. Univ. of Munich
Work. Conf. on *International Office of the Future: Design Options and Solution Strategies*	9-11 Apr 96	Tucson, AZ, U.S.A.	**IFIP** WG8.4 U. of Arizona
Work. Conf. on *Broadband Communications '96 — BB'96*	23-25 Apr 96	Montreal, Canada	**IFIP** WG 6.2 IEEE-CS
Intl. Conf. on *Nonlinear Problems in Aviation and Aerospace*	9-11 May 96	Daytona Beach, FL, U.S.A.	Intl. Fed. of Non-Linear Analysts **IFIP** WG7.2
Work. Conf. on *Domain Analysis and Modelling for Interactive Systems*	9-12 May 96	Geneva, Switzerland	**IFIP** WGI3.2 WG8.I
Twelfth Intl. Open Conf. on *Information Systems Security: Facing the Information Society of the 21st Century — IFIP/SEC'96*	21-24 May 96	Island of Samos, Greece	**IFIP** TCI I Greek Comp. Soc. Cyprus Comp. Soc.
Work. Conf. on *Information and Communication Technology: Supporting Change in Teachers Education*	30 Jun — 5 July 96	Kfar Blum, Israel	**IFIP** TC3, WG3.1 & 5
Thirteenth *IFAC World Congress '96*	30 Jun — 5 Jul 96	San Francisco, CA, U.S.A.	IFAC

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IFIP Congress '96 — 14th World Computer Congress	2-6 Sep 96	Canberra, Australia	**IFIP**
IFIP Congress '98 — 15th World Computer Congress	23-29 Aug 98	Vienna, Austria and Budapest, Hungary	**IFIP**

This calendar information is furnished to the *Newsletter* by the Secretariat. It contains only approved **IFIP** events, arranged by local Organizing Committees. I **FIP** does not assume any financial or legal liability. The Secretariat can fumish details of most of the events listed. Please see page 15 for a schedule of **IFIP** administrative meetings.