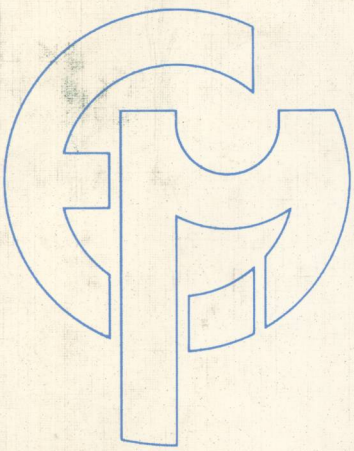
SUPERCOMPUTERS: TECHNOLOGY AND APPLICATIONS

EUROMICRO SYMPOSIUM

ZURICH,
AUGUST/SEPTEMBER 1988

S. WINTER
H. SCHUMNY
EDITORS



NORTH-HOLLAND

SUPERCOMPUTERS: TECHNOLOGY AND APPLICATIONS

fourteenth EUROMICRO symposium on microprocessing and microprogramming (EUROMICRO '88)

Zurich, August 29–September 1, 1988

edited by
Stephen Winter
Harald Schumny

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CHAIRMAN'S INTRODUCTION

EUROMICRO 88 is the fourteenth in the series of annual symposia organized by the European Association for Microprocessing and Microprogramming (EUROMICRO) based in Enschede, The Netherlands. After fourteen years EUROMICRO returns for the first time back to Switzerland where the association was founded in 1974 in Lausanne. The structure of this year´s conference follows the succsessful scheme of its predecessors, but contains also several interesting improvements which shall make it even more attractive to participate.

The annual EUROMICRO symposium is the leading European forum concerned with microprocessors and all related topics. It attracts contributions and participants from almost all European countries, the United States, Africa, and the Far East.

The significance of this symposium is also reflected by the generous sponsoring support of many leading companies and Swiss Authorities. Please refer to the inner title page of these proceedings for a complete list. Their financial support to EUROMICRO 88 is very much appreciated.

Although the general heading of this year´s symposium Supercomputers: Technology and Applications might seem somehow contradictionary for EUROMICRO at a first view, it enlightens the overall trend we can observe daily. The traditional classification into micros, minis and mainframes has become more or less obsolete for already a couple of years. Instead the performance of some recent microprocessors and particularly those chips, which carry a lot of internal parallelism, have achieved a computational power of near supercomputer ranges. This status is strongly reflected by seveal sessions of the Zurich symposium.

The scientific and technical program at EUROMICRO 88 includes three keynote sessions with invited papers, about 100 contributed papers out of more than twice as much submitted, and a line of short-note papers. In addition, a special session on Computer Music will be performed for a first time. A Computer Music Concert open to the public will show the progress achieved so far by the experts in this field.

I have been most fortunate that Stephen Winter from the Polytechnic of Central London took responsibility as Program Chairman for EUROMICRO 88. He did an extremely professional job well supported by his Deputy Program and Short Notes Chairman Harald Schumny from Physikalisch- Technische Bundesanstalt in Braunschweig, Germany. The result of their combined efforts are contained in these proceedings.

In addition to the scientific program, EUROMICRO 88 features similar as in the foregoing years a Robot Ping-Pong which brings together several international groups of young and engaged technicians whose experiments are open to all conference attendants.

Two new events have still to be mentioned explicitly. In order to support technical ad-hoc discussions among the participants in more structured manner, so-called DIY (Do-It-Yourself)-Panels will be established. According to the attendants´ desire, selected professional topics may be choosen and all conference delegates who are interested may actively participate. The organizers of EUROMICRO 88 are convinced that this type of communication will be a further attraction of this symposium. Furthermore, a few real products related to the symposium´s general theme will be exhibited at main conference site. In this way the delegates may obtain additional information about the current state-of-the-art.

The site of EUROMICRO 88 is University Zurich-Irchel where excellent convention facilities are available in a rather close-to-downtown location. The participants will find there the right athmosphere for an exchange of ideas and information flow. The Institut für Informatik (Computer Science) at the University of Zurich as well as the other facilities at the Swiss Federal Institute for Technology (ETH) are not only known in Switzerland.

Thus, I am most grateful for the support of the University of Zurich and particularly the Institut für Informatik. But I also have to thank my colleague Kurt Bauknecht without whose competent help and support, this symposium could hardly have taken place at this favorable location. Furthermore, I appreciated very much the non-ending assistance and support from Doris Morelli, Rade Adamov and many other members of the Institut für Informatik. Their help is extremely acknowledged.

From the EUROMICRO organization I am indebted first of all to Chiquita Snippe-Marlisa who did everything imaginable at EUROMICRO´s homestead in Enschede, The Netherlands, to make this symposium a success. Besides her I should like to thank all my colleagues from the EUROMICRO Council who supported me with many valuable suggestions and energetic assistance.

Last but not least I wish to thank all the delegates participating in EUROMICRO 88. I hope very much that your expectations will be met and that this symposium will be a success for you.

Lutz Richter
General Chairman
EUROMICRO 88

PROGRAMME CHAIRMAN'S INTRODUCTION

The purpose of EUROMICRO 88, which is the fourteenth annual symposium organised by Euromicro, is to bring together people from business, industry, government and academia, who are interested in all problems related to the technology and application of micro-computer systems. The symposium, whose motif this year is "Supercomputers: Technology and Applications", is being held at the Institut für Informatik der Universität Zürich.

Three keynote addresses, one each day starting at 11.30 in the Main Auditorium, will be made by leading experts on the technology and application themes of supercomputing systems:

* Oberon: A Flexible, Efficient and Extensible Workstation System
  by Prof Niklaus Wirth, Professor of Computer Science at ETH Zurich

* Communication Strategies in International Banking
  by Dr. Hubert Huschke, Executive Vice-President of the Union Bank of Switzerland

* Microprogramming, Microprocessing and Supercomputing
  by Dr. Joseph A. Fisher, Founder and Executive Vice-President of Multiflow Computers Inc.

The opening address will be given by Professor H.H. Schmid, Rector of the University of Zurich.

Technical papers were invited on four major themes of Supercomputing: Microelectronics, Software Engineering, Parallel Processing and Applications. In response, a record number of 197 papers were submitted by authors for consideration, and based on the reviews of an international panel of over 200 referees, 100 papers were finally selected for inclusion in the major scientific and technical programme.

The main technical programme has been scheduled as four parallel tracks. Each track is devoted, in the main, to one of the above themes, so that particpants may elect to follow an entire theme by staying in the appropriate track. An exception to this is the parallel processing theme, which unsurprisingly in view of the Supercomputing motif, attracted a large proportion of the submitted papers, and has been split between Tracks 2, 3 and 4. It will, nevertheless, be possible to attend more than half of the presented papers on parallel processing. The themes are organised into the following sessions:

* MICROELECTRONICS THEME
  * VLSI Design Tools
  * Specification & Verification
  * Processor Architectures
  * Fault Tolerance & Reliability
  * The VLSI-/370 Microprocessor

* SOFTWARE ENGINEERING THEME
  * Formal Methods
  * Object-oriented Approach
  * System Aspects
  * Environments

* PARALLEL PROCESSING THEME
  * Multiprocessors
  * Transputers
  * Array Processors
  * Networks
  * Function-directed & Neural Architectures
  * Operating Systems & Environments
  * Concurrent Program Design
  * Simulation
  * Fault Tolerance

* APPLICATIONS THEME
  * Real Time Systems
  * Sensors & Robotics
  * Image & Speech Processing
  * Education

There is also a separate track of Short-note sessions, which are designed to accommodate topical reporting of recent work in all fields relevant to the symposium. These papers will be published in the Euromicro Journal early in 1989.

An innovation for Euromicro symposia is a special session on Computer Music, which will complement the evening performances on the social programme. The music papers are included in these Proceedings.

The three-day symposium is preceeded by a tutorial programme consisting of:

* The Software Production Process
  by Dr. G. Chroust, IBM Austria

* Computer Graphics & Image Processing by Prof. P. Stucki, Institut für Informatik, Universität Zürich

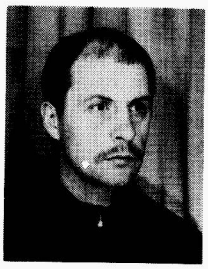
We extend our thanks to Professor Lutz Richter, who as Conference Chairman, has expended enormous effort to provide an excellent setting for EUROMICRO 88.

The programme itself would not have offered such a rich variety if there had not been so many contributors: the authors, programme committee, reviewers and session chairman. I would especially like to mention the roles of the Deputy Programme Chairman, Harald Schumny, for co-ordinating the Short Notes sessions; Fausto Distante, for organising the Music session; and John Molgaard, Derek Wilson and Robert Negrini, the major theme co-ordinators.

The Programme Committee has put in a lot of hard work, and the efforts and support of the Euromicro Administrative Manager, Mrs Chiquita Snippe-Marlisa, are much appreciated.

Special thanks to go Philippe Fernin and Henri Guiheux for invaluable administrative assistance, and also to my family, for helping out whenever needed. Finally, I wish to thank all co-workers, colleagues and friends who have contributed to the scientific programme of EUROMICRO 88.

Stephen Winter
Programme Chairman
EUROMICRO 88



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