

# Preface

This book stands as the visible mark of *VECPAR'98 – 3rd International Meeting on Vector and Parallel Processing*, which was held in Porto (Portugal) from 21 to 23 June 1998. *VECPAR'98* was the third of the *VECPAR* series of conferences initiated in 1993 and organised by *FEUP*, the Faculty of Engineering of the University of Porto.

The conference programme comprised a total of 6 invited talks, 66 contributed papers and 18 posters. The contributed papers and posters were selected from 120 extended abstracts originating from 27 countries.

## Outline of the book

The book, with 7 chapters, contains 41 contributed papers and 6 invited talks. The 41 papers included in these proceedings result from the reviewing of all papers presented at the conference.

Each of the first 6 chapters includes 1 of the 6 invited talks of the conference, and related papers. Chapters 1, 2, 4, 5 and 7 are initiated by an introductory text providing the reader with a guide to the chapter contents.

Chapter 1 is on numerical algebra. It begins with an introductory text by Vicente Hernández, followed by the invited talk by Gene Golub, entitled *Some Unusual Eigenvalue Problems*. The remaining 11 contributed articles in this chapter deal either with large scale eigenvalue problems or with linear system problems.

Computational fluid dynamics and crash and structural analysis were brought under the same chapter and that is Chapter 2, which contains the invited talk by Timothy Barth, entitled *Parallel Domain Decomposition Pre-conditioning for Computational Fluid Dynamics*, plus 8 contributed papers. Timothy Barth also authors the introductory text to the chapter.

The invited talk by Peter Welch, entitled *Parallel and Distributed Computing in Education*, alone makes up Chapter 3.

The main article in Chapter 4 is the invited talk, by Jean Vuillemin, entitled *Reconfigurable Systems: Past and Next 10 Years*. José Silva Matos provides the introductory text. Apart from the invited talk, the chapter contains 15 contributed papers, covering subjects such as computer organisation, programming and benchmarking.

Thierry Priol authors the introductory text and also the invited talk in Chapter 5, entitled *High Performance Computing for Image Synthesis*. The chapter includes only one contributed paper.

Database servers are the topic of Chapter 6, which includes the invited talk entitled *The Design of an ODMG Conformant Parallel Object Database Server*, by Paul Watson.

Chapter 7 brings the book to an end with 6 papers on various nonlinear problems. The main features of these articles are discussed by Heather Ruskin and José A.M.S. Duarte in their introductory text.

## Readership of this book

The wide range of subjects covered by this book reflects the multi-disciplinarity of the *VECPAR* series of conferences. The book may be of interest to those in scientific areas, as for instance computational methods applied to either engineering or science in general, computer architectures, applied mathematics or computational science.

## Student papers

To encourage the participation of students and provide a stimulus that may be of great importance for their careers, *VECPAR'98* included a student paper competition for the first time. There were 10 participants in this competition. The evaluation was performed by a jury of 13 members that attended the presentations, questioned the students and evaluated the written version of the work.

As a result of this competition 2 articles emerged. The first prize was awarded to M. Arenaz (Spain) with the work entitled *High Performance Computing of a New Numerical Algorithm for an Industrial Problem in Tribology*, by M. Arenaz, R. Doallo, G. García and C. Vázquez. An honourable mention was awarded to Carmen Borges (Brazil) for her study entitled *A Parallelisation Strategy for Power Systems Composite Reliability Evaluation*, by C.L.T. Borges and D.M. Falcão.

## Paper selection

The extended abstracts and the papers were evaluated on the basis of technical quality, originality, importance to field, and style and clarity of presentation. Each paper was marked in a scale ranging from 1 (poor) to 5 (excellent). No paper with a score lower than 3.5 was included in this book.

One must note that, in our terminology, an *extended abstract* is what some may call conference paper, and a *paper*, as included in the book and presented at the conference, is what some may call a journal article. The extended abstracts had a maximum of 2000 words (about 7 printed pages) and the articles could run to 14 printed pages, or 30 printed pages in the case of the invited talks. We believe that authors should have no major space limitations that could prevent them from presenting their work in full detail.

It is our hope that the efforts put into the selection process have contributed to the prestige of the *VECPAR* series of conferences and the quality of this book, making it a valuable source of future reference.

January 1999

*José M.L.M. Palma,  
Jack Dongarra  
Vicente Hernández*

## Acknowledgments

This book, a 700 page document, contains the results of the organisational works performed over 2 years, since the 2nd edition of *VECPAR* in 1996.

First, one must acknowledge the excellent work of the Organising Committee. Lígia Ribeiro's and Augusto de Sousa's attention to details contributed to a general feeling of satisfaction among the participants of the conference.

The Local Advisory Organising Committee was much more than its name may suggest. It was its responsibility, jointly with the Organising Committee and a restricted number of members of the Scientific Committee, to identify the topics of the conference, to select those for which an invited speaker should be designated, and also to identify the Invited Speaker. To honour the multidisciplinary nature of the *VECPAR* conferences, the help of colleagues was required (too many to mention here), to whom we are grateful for providing us with information and suggestions on who should be invited.

The selection of the articles was much facilitated by the excellent work of the Scientific Committee. Our colleagues were extremely generous in providing part of their precious time for careful reading of the many documents that we asked them to review. The depth and detail of their comments were essential: firstly to us, when making the final decision on which manuscript to accept or reject; and secondly to authors, providing them with suggestions that contributed to further improvement of their work.

Our word of gratitude also to all authors and participants at *VECPAR'98*. They were those who made the conference possible and also those for whom the conference was intended.

The financial support of all sponsoring organisations is also acknowledged.

## Committees

### Organising Committee

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C. Sá	Universidade do Porto, Portugal
A. Sousa	Universidade do Porto, Portugal
K. Schloegel	University of Minnesota, USA
P. Watson	University of Newcastle, England
P. Welch	The University of Kent at Canterbury, England

## Best Student Paper Award (Jury)

Filomena d'Almeida	Universidade do Porto, Portugal
Michel Daydé	ENSEEIH-IRIT, France
Jack Dongarra	University of Tennessee and Oak Ridge National Laboratory, USA
José Duarte	Universidade do Porto, Portugal
José Fortes	University of Purdue, USA
Sílvio Gama	Universidade do Porto, Portugal
Gene Golub	Stanford University, USA
Vicente Hernández	Universidad Politécnica de Valencia, Spain
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Alberto Proença	Universidade do Minho, Portugal
Rui Ralha	Universidade do Minho, Portugal
Heather Ruskin	Dublin City University, Ireland

## Sponsoring Organisations

FEUP - Faculdade de Engenharia da Universidade do Porto  
FCT - Fundação para a Ciência e Tecnologia  
EOARD - European Office of Aerospace Research and Development  
Fundação Dr. António Cupertino de Miranda  
FLAD - Fundação Luso Americana para o Desenvolvimento  
Reitoria da Universidade do Porto  
FCCN - Fundação para a Computação Científica Nacional  
Fundação Calouste Gulbenkian  
AEFEUP - Associação de Estudantes da Faculdade  
de Engenharia da Universidade do Porto  
Câmara Municipal do Porto  
Digital Equipment Portugal  
Bull Portugal  
ICL  
SGI - Silicon Graphics Inc.  
Porto Convention Bureau  
PT - Portugal Telecom  
Sicnet - Sistemas Integrados de Comunicações,  
Novos Equipamentos e Tecnologias, Lda

## Invited Lecturers

- Timothy Barth  
NASA Ames Research Center, Moffett Field, USA
- Gene Golub  
Stanford University, Stanford, USA
- Thierry Priol  
IRISA/INRIA, Rennes, France
- Jean Vuillemin  
École Normale Supérieure, Paris, France
- Paul Watson  
University of Newcastle-upon-Tyne, England
- Peter Welch  
University of Kent at Canterbury, England



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