




Fourth Mexican International Conference on

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Foreword

It is with great pleasure that we welcome you to the Fourth Mexican International Conference in Computer Science ENC 2003. The SMCC (Sociedad Mexicana de Ciencias de la Computación) has organized these academic meetings to bring together scientists and students working in all fields of Computer Science from the major research institutions and universities in Mexico, as well as guest institutions from around the world, to share the latest advances in computer science research. This event seeks to promote research exchanges that will benefit our academic community. We are proud to have a high quality technical program, as exemplified by the papers collected in these proceedings, which provides evidence of a maturing computer science community in Mexico.

In putting together this conference, we have had the pleasure of working with an outstanding group of volunteers who dedicated substantial portions of their already busy schedules to create a superb conference. We thank them all for their hard work on behalf of this conference and applaud the program they have helped create. In particular we would like to thank the hard working group of local sponsors at the Universidad Autónoma de Tlaxcala led by Guillermo Alvarez.

We extend our thanks to our sponsoring SMCC organization, its executive committee for the confidence it has shown on us and their constant advice, and its staff who supported us in innumerable ways.

We extend a special acknowledgment to our sponsoring organizations: Consejo Nacional de Ciencia y Tecnología (CONACyT) and the National Science Foundation (NSF), as well as our corporate sponsors: Sun Microsystems and Microsoft. Their support has helped make this conference possible.

Last, but certainly not least, we thank you for your interest in ENC 2003, and very much hope you find your experience in the conference to be enriching.

Jesús Favela
ENC'03 General Chair

Antonio Sánchez Aguilar
President SMCC

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Preface

ENC'03 is a symposium in computer science, organized by The Mexican Society of Computer Science (SMCC), in collaboration with several educational and research institutions across the country. ENC is the biannual forum that gathers (in Mexico), researchers, educators, and scholars from around the world to present and discuss progress, challenges and opportunities in Computer Science.

The venue for ENC'03 was the city of Tlaxcala, Tlaxcala. Our host was the Universidad Autónoma de Tlaxcala. With the enthusiastic participation of the computer science community, we hope ENC'03 has surpassed the achievements of previous editions of the conference, which were held in Queretaro (1997), Pachuca (1999) and Aguascalientes (2001).

With this fourth edition, ENC aimed at: continuing to provide a forum in Mexico for presentation and discussion of advances and new research in computer science; strengthening the sense of community among computer science researchers and practitioners in Mexico; as well as reinforcing our academic community's links with the global community through a high-quality international technical program.

The selection of papers followed a strict refereeing process by a renowned international committee. In addition to research papers in all areas of computer science, ENC featured a rich mix of discussion panels, plenary lectures and hands-on tutorials given by international lecturers and instructors invited by each of the Special Interest Groups of SMCC. We received 120 contributions, and 46 were selected to be presented and published in this proceedings volume.

We also had six internationally renowned scholars as keynote speakers: Gregory D. Abowd, Georgia Tech, USA; Martín Farach-Colton, Rutgers, USA; Mario Gerla, UCLA, USA; Gonzalo Navarro, U. Chile, Chile; Jorge Nocedal, Northwestern University, USA; and Alan Watt, U. Sheffield, UK.

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Editors

