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# High Performance Computing – HiPC 2005

12th International Conference  
Goa, India, December 2005  
Proceedings



Springer

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## Message from the Program Chair

Welcome to Goa and the 12th International Conference on High Performance Computing!

This year, we were delighted to receive 362 submissions to this conference from more than 30 different countries, including (besides India!) countries in North and South America, Europe, Asia, Africa, and Australia. This is a major increase compared with last year (253 submissions from 25 countries). Eventually, 50 submissions from 12 different countries were selected for presentation at the conference and publication in the conference proceedings.

This sharp increase in the number of submissions meant we had to adapt the regular selection process used in previous years. First, all submitted papers were carefully considered by the Program Chair and Vice-Chairs to check their consistency with the minimal syntactic requirements for acceptance. At the end of this first stage, we were left with 271 submissions, which were further considered by the Program Committee. Each of these papers was reviewed by three Program Committee members. As many as 785 reviews were collected (2.90 per paper on average) and each paper was discussed at the online Program Committee meeting. Finally, 50 out of 271 (18.5%) were accepted for presentation and publication in the proceedings.

Among them, two outstanding papers were selected as “Best Papers”; one focusing on the Systems Software area (“Preemption Adaptivity in Time-Published Queue-Based Spin Locks,” by Bijun He, William N. Scherer III, and Michael L. Scott) and the other focusing on the Architecture area (“Criticality Driven Energy Aware Speculation for Speculative Multithreaded Processors,” by Rahul Nagpal and Anasua Bhowmik). They will be presented in a separate plenary session, and each paper will be awarded a prize sponsored by InfoSys.

Here is a general summary of the results with respect to the origin of the submissions:

Submission origin	Reviewed	Accepted	Acceptance rate
Overall	362	50	13.8%
India	56.4%	28%	6.9%
Asia except India	19.3%	10%	7.1%
North America (mainly USA)	14.4%	46%	44%
Elsewhere (mainly Europe)	9.9%	16%	22%
Total	100%	100%	

These figures show that the selection process was highly competitive. We are pleased to accommodate ten (parallel) technical sessions of high-quality contributed papers, plus the special plenary “Best Papers” session. In addition, this year’s conference also features a poster session, industrial exhibits, five keynote addresses, five tutorials and four workshops.

It has been a pleasure putting together this program with the help of five excellent Program Vice-Chairs and their 70 Program Committee members. The hard work of all the Program Committee members has been deeply appreciated. I especially wish

to acknowledge the dedicated effort put forth by the Vice-Chairs: Michael A. Bender (Algorithms), Zhiwei Xu (Applications), José Duato (Architecture), M. Cristina Pinotti (Communication Networks), and Satoshi Matsuoka (System Software). Without their help and timely work, the quality of this program would not be as high nor would the process have run so smoothly.

I thank the other organizers who have contributed to assembling this program, including those who organized the keynotes, tutorials, workshops, awards, poster session, industry exhibits, and those who performed the administrative functions that have been essential to the success of this conference. The work of Sushil K. Prasad in putting together the conference proceedings is also acknowledged, as well as the support provided by Kamesh Madduri and Vaddadi Chandu, Ph.D. students at Georgia Institute of Technology, and Vipin Sachdeva, M.S. student at the University of New Mexico, in assisting with the EDAS online paper submission and evaluation software. Last, but certainly not least, I express heart-felt thanks to our General Co-chairs, Manish Parashar and V. Sridhar; Steering Chair, Viktor Prasanna; and to the Vice-General Chair, Rajendra V. Boppana; for all their useful advice.

Lastly, I thank the Conference General Co-chairs for allowing me to serve our community as the Program Chair of this high-quality international conference. It has been my pleasure to correspond with so many of you, and I personally welcome you to Goa. As you can see from these proceedings, we have made considerable effort to select and assemble the highest-quality technical program for this year's meeting. Please enjoy the informative and stimulating presentations and your entire experience at HiPC 2005 including the food and beautiful coastal scenery in this culturally-rich location of Goa, India!

December 2005

David A. Bader

## **Message from the General Co-chairs and the Vice General Chair**

On behalf of the organizers of the 12th International Conference on High Performance Computing (HiPC), it is our pleasure to welcome you to the paradise state of Goa.

The HiPC 2005 technical program includes technical paper sessions interspersed with keynotes from leading HPC researchers, a poster paper session, an industry session with presentations from leading HPC companies, a HPC user community meeting, an exhibition, tutorials on hot topics in computing and networking, and several workshops focusing on emerging areas. We do hope you find the conference and these proceedings exciting and rewarding.

This year, the HiPC call for papers, once again, received an overwhelming response with a record number of submissions from across the globe. For this, we would like to specially thank David Bader, Program Chair, who, with remarkable dedication, put together an outstanding technical program consisting of the papers that appear in these proceedings. We would also like to thank the program committee for their efforts in assembling such an excellent program and the authors who submitted the high quality material from which that program was selected. We would like to especially thank the presenters of the keynotes, posters and tutorials, the organizers of the workshops, and all the participants, who complete the program.

Arranging an exciting meeting with a high quality technical program is easy when one is working with an excellent and dedicated team and can build on the practices and levels of excellence established by a quality research community. HiPC 2005 would not have been possible without the tremendous efforts of the many volunteers. We would like to acknowledge the critical contributions of each one. We would specially like to thank Viktor Prasanna, Chair of the HiPC Steering Committee, for his leadership, sage guidance, and untiring dedication. This year we were lucky to have a number of new volunteers joining us. We would like to welcome you to the team and thank you – your efforts are critical to the continued success of this conference.

We would like to gratefully acknowledge our academic and industrial sponsors including IEEE Computer Society, ACM SIGARCH, EATCS, IFIP, BHU, Infosys, Satyam, HP, IBM, Cray, Dell, and Sun. We would also like to acknowledge the local support we have received from Cidade De Goa, Goa Chamber of Commerce and Industry, National Institute of Oceanography, and Goa University.

Once again, we welcome you to Goa and HiPC 2005.

December 2005

Manish Parashar  
V. Sridhar  
Rajendra V Boppana

## Message from the Steering Chair

It is my pleasure to welcome you to the 12th International Conference on High Performance Computing and to Goa, a unique city with its blend of Indian and Portuguese culture. First, I would like to single out the contribution of David Bader, Program Chair, for his enthusiasm, commitment and attention to details in putting together an excellent technical program. We received a record number of submissions this year, surpassing our previous high set last year. I am grateful to David for his efforts and thoughtful inputs in putting together the program.

2005 marks a year in transition. We have several new volunteers who continue the rich tradition set by HiPC over the years. Manish Parashar, General Co-chair, took responsibility for the overall meeting organization. He identified several new volunteers as well as handling local arrangements in Goa. I would like to welcome Rajendra Boppana, Vice General Chair, Rajeev Thakur, Poster/Presentation Chair, Anu Bourgeois, Student Scholarships Co-chair, Rajeev Raje, Publicity Co-chair, and Viraj Bhat, Cyber Chair, to the “HiPC family.” The continued efforts of Rajeev Muralidhar of Intel India and Ramamurthy Badrinath of HP India are gratefully acknowledged.

The technical program was expanded through committed efforts from several volunteers. Ramamurthy Badrinath, with assistance from Venkat Ramana of Hinditron Infosystems, put together the first HPC Users’ Group meeting. Frank Baetke of HP organized a panel entitled “Processors, Instruction Sets, Operating Systems – Challengers and Survivors”.

I would like to thank all our volunteers for their tireless efforts. The meeting would not have been possible without the enthusiastic commitment of these individuals.

Major financial support for the meeting was provided by several leading IT companies in India. I would like to acknowledge the following individuals and their organizations for their support: N.R. Narayana Murthy, Infosys, India; Kris Gopalakrishnan, Infosys, India; Harish Grama, IBM India; P. Gopalakrishnan, IBM Solutions Research Center, India; Venkat Ramana, Hinditron Infosystems; Dinkar Sitaram and Faisal Paul, HP India; V. Sridhar, Satyam; Raghuram Tupuri, AMD; Raj Yavatkar and Kumar Ranganathan, Intel.

Finally, I would like to thank Animesh Pathak at USC for his continued assistance and enthusiasm in organizing the meeting.

December 2005

Viktor K. Prasanna



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