Soma Chaudhuri
Samir R. Das
Himadri S. Paul
Srikanta Tirthapura (Eds.)

Distributed Computing and Networking

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8th International Conference, ICDCN 2006
Guwahati, India, December 2006
Proceedings

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Soma Chaudhuri Samir R. Das
Himadri S. Paul Srikanta Tirthapura (Eds.)

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Volume Editors

Soma Chaudhuri
Iowa State University
Department of Computer Science
230 Atanasoff Hall, Ames, IA 50011, USA
E-mail: chaudhur@cs.iastate.edu

Samir R. Das
Computer Science Department, SUNY at Stony Brook
Stony Brook, NY 11794-4400, USA
E-mail: samir@cs.sunysb.edu

Himadri S. Paul
Indian Institute of Technology, Guwahati
Department of Computer Science & Engineering
Guwahati-781039, India
E-mail: hspaul@iitg.ernet.in

Srikanta Tirthapura
Iowa State University
Department of Electrical and Computer Engineering
Ames, IA, 50010, USA
E-mail: snt@iastate.edu

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Message from the General Chairs

The *Eighth International Conference on Distributed Computing and Networking*, which was held in Guwahati, India in December 2006, is an outgrowth and a continuation of the sequence of workshops titled *International Workshop on Distributed Computing (IWDC)*". Since its modest start in 1999, this annual event has grown rapidly in scope, volume, quality and visibility. Being traditionally situated in the different academic centers in India, it has also reflected the high-level research carried out in India in the area of distributed computing, and has helped to nourish and strengthen research interconnections among researchers in India itself as well as with distributed computing researchers throughout the world.

During the seventh meeting of IWDC, held last December in Kharagpur, the Steering Committee noted with deep satisfaction how the once small workshop has gradually grown, through the efforts of a dedicated group of academics in the area, and acquired the stature and recognition of a leading international conference. Subsequently, the Steering Committee decided to reflect this development by changing the title of the meeting from a *Workshop* to a *Conference*. At the same time, it was also recognized that the recent shifts in research interests within the area of distributed computing, and particularly the recent focus on topics related to distributed networking and on links bridging between distributed computing and networking, should also be reflected in the new name. The conference was thus renamed the *International Conference on Distributed Computing and Networking* (*ICDCN*). It should be stressed that while the new name entails a certain departure from the traditional track outlined by the seven previous IWDC meetings, with an eye towards further expansion in size, scope and competitiveness, the underlying intention is still to maintain and preserve the special character of IWDC, as well as many of the features that contributed to its past success, and particularly the pleasant and informal atmosphere, facilitating close interactions and academic discussions.

Organizing a large conference is not a trivial task, and we are indebted to many. First and foremost, we are thankful to our generous sponsors, IBM, HP India Ltd., The Department of Science and Technology and The Department of Information Technology of the Government of India, for their benevolent support which was vital to making the conference a success.

The Program Committee made arduous efforts in reviewing the numerous submissions and selecting an impressive collection of high-quality papers for presentation. Our sincere thanks are due to the Program Chairs, Soma Chaudhuri and Samir R. Das, for coordinating and leading this effort, culminating in an exciting and well-balanced program. We are grateful to the Keynote Chair, Sajal K. Das, for arranging five high-quality keynote talks by eminent leaders in the field. Following the tradition of previous years, we set up four advanced tutorials on topics of interest, relevant to the

realm between distributed computing and networking, namely, Modeling Biological Networks, Network Security, Algorithmic Issues in Wireless Sensor Networks, and Optical Networking. This was made possible by the efforts of the Tutorial Chairs, Sridhar Iyer and Pinaki Mitra.

The Organizing Committee worked hard to ensure that the participants enjoyed a comfortable stay and the technical meetings proceeded as smoothly as possible. We are grateful to the General Vice Chair, Sukumar Nandi, for arranging to hold the conference in Guwahati and for all he did to make the conference a success. Thanks are due to the Publicity Chairs, P. K. Das and Sriram V. Pemmaraju, for their great work in publicizing the event both locally and internationally, to the Publication Chairs, H. S. Paul and Srikanta Tirthapura, for their tremendous efforts in compiling the final proceedings, and to the Organizing Chair, D. Goswami, the Finance Chair, J. K. Deka, and the Scholarship Chair, S. V. Rao, for their hard work.

We are grateful to the Indian Institute of Technology Guwahati for extending the logistic support to the conference. We thank Sukumar Ghosh, the head of the ICDCN Steering Committee, for his guidance, continuous support and advice.

Last but not least, we extend our heartfelt thanks to the authors, reviewers and participants of the conference, for their vital contribution to the success of this conference. It is our sincere hope that this event becomes another invaluable link in the sequence of IWDC and ICDCN meetings and a useful outlet for knowledge dissemination within the distributed computing and networking communities.

December 2006

Gautam Barua
IIT Guwahati
Guwahati, India

David Peleg
Weizmann Institute of Science
Rehovot, Israel

Message from the Technical Program Chairs

Welcome to the Proceedings of the Eighth *International Conference on Distributed Computing and Networking* (*ICDCN*), 2006! This event was previously known as *IWDC* or *International Workshop on Distributed Computing*. It is great to see that a small workshop that grew out of the interests of a dedicated group of enthusiasts now has gained the stature of a truly international conference, covering most aspects of distributed computing and networking.

This year we received 245 paper submissions continuing on the growth trend that we observed in recent years. We received submissions from all over the world. The electronic submission system (WIMPE) registered authors from India, USA, China, Korea, UK, Canada, Iran, Germany, Greece, Netherlands, France, Italy, Israel, Lebanon, Turkey, Ireland, and Poland, reflecting a true international nature of the conference. A good fraction of submitted authors are from outside India, a fact also reflected in the conference program and the content of these proceedings.

Similar to the geographical diversity, the topical diversity of the submissions was noteworthy. All topics mentioned in the Call for Papers were covered. The 50 members of the Technical Program Committee along with a team of external reviewers worked hard on the reviews under a very strict timeline. At the end of the review period, the Program Chairs selected 29 regular papers and 30 short papers for inclusion in the proceedings and presentation in the conference.

We were also fortunate to have an array of keynote speakers – Faith Ellen (University of Toronto), Nicola Santoro (Carleton University), Eli Gafni (UCLA), Shay Kutten (Technion), Manindra Agrawal (IIT-Kanpur), Anurag Kumar (Indian Institute of Science). Their talks provided us with the unique opportunity to hear the leaders of their fields. Their papers related to the talks are also included in these proceedings.

The main conference program was preceded by a day of tutorial presentations. We had an array of four tutorials, presented by Kalyan Basu (University of Texas at Arlington), Indranil Sen Gupta (IIT, Kharagpur), Sriram Pemmaraju (University of Iowa) and Ashwin Gumaste (IIT, Bombay), on biological networks, network security, sensor networks and optical networks, respectively.

We thank all authors for their interest in ICDCN 2006, and all Program Committee members and external reviewers for their commitment in spite of a tight schedule and a high review load. We hope that you will find the IDCDN proceedings to be technically rewarding.

December 2006

Soma Chaudhuri
Iowa State University
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