Special Issue on Distributed Computing

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This special issue of Theory of Computing Systems is dedicated to distributed computing. The International Conference on Distributed Computing and Networking (ICDCN) 2011 had two tracks, distributed computing and networking, each with a separate program committee. ICDCN 2011 got 140 submissions from over 15 countries, and submissions were carefully reviewed and evaluated by the program committee. For the distributed computing track, the Program Committee eventually selected 15 regular papers and 1 short paper for inclusion in the proceedings and presentation at the conference. The networking track had 16 regular papers and 2 short papers.

From the distributed computing track of ICDCN 2011, the program committee invited the authors of a number of selected papers to submit extended versions of their conference papers for publication in journals. Based on the topic of a selected paper, a paper was invited to either Operating Systems Review or Theory of Computing Systems. This issue presents the four selected papers for Theory of Computing Systems. After submission, all invited papers went through several rounds of careful reviewing by external peers to ensure they met the high standards for journal scholarly publication.

The first paper is “Generating Fast Indulgent Algorithms”, by Dan Alistarh, Seth Gilbert, Rachid Guerraoui, and Corentin Travers. The paper proposes a technique to transform algorithms for synchronous systems into algorithms that work in partially synchronous systems, using an asynchrony detector abstraction defined in the paper.

The second paper in this issue is “A Single-Version STM that is Multi-Versioned Permissive”, by Hagit Attiya and Eshcar Hillel. This paper presents a new software

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transactional memory with several interesting properties: it keeps only one version of data items, it never aborts read-only transactions, it avoids spurious aborts of non-conflicting transactions, and it avoids unnecessary contention on the memory.

The third selected paper is “Efficient Decentralized Algorithms for the Distributed Trigger Counting Problem”, by Venkatesan T. Chakaravarthy, Anamitra Roy Choudhury, Vijay K. Garg, and Yogish Sabharwal. This paper considers the distributed trigger counting problem, in which n processors may receive triggers for an event, and the system needs to notify the user if the total number of triggers reaches a chosen value w . Several algorithms are proposed that trade off the total message complexity for the maximum number of messages sent or received by a processor.

The fourth selected paper is “A Near Optimal Periodic Transmission Schedule in Bounded Degree Wireless Sensor Network”, by Bala Kalyanasundaram and Mahe Velauthapillai. The paper considers the problem of finding a periodic schedule of transmissions in a wireless sensor network so that each sensor can communicate with all of its neighbors without interference. The proposed protocol uses $O(\log n)$ random bits and transmissions per sensor, under a generalized interference model, for a network with bounded degree.

We hope that you will enjoy reading this special set of selected papers.

Acknowledgments

We are grateful to all authors who submitted a paper to ICDCN 2011, and especially those who later extended their papers for journal publication. We thank the ICDCN Program Committee members and external reviewers for their diligence and commitment. We thank the conference General Chairs, Lorenzo Alvisi and Sanjoy Paul, as well as other organizational committee members, for working with us to make ICDCN 2011 a success. We thank Alan L. Selman for providing a forum for these selected papers in Theory of Computing Systems.

About ICDCN 2011

The International Conference on Distributed Computing and Networking (ICDCN) is a yearly premier international forum for distributed computing and networking researchers, vendors, practitioners, application developers, and users. It originally started as the International Workshop on Distributed Computing (IWDC) in 2000. With the growing number of paper submissions to the Workshop as well as more submissions related to networking, IWDC grew into ICDCN in 2006. ICDCN (<http://icdcn.iitkgp.ac.in/>) continues to expand as a leading forum for disseminating the latest research results in distributed computing and networking.

ICDCN 2011 was held Bangalore, India, on 2–5 January 2011. Bangalore is the capital of the Indian state of Karnataka. Bangalore has many well-recognized universities and research institutions in India, and is known as Indian’s Silicon Valley. The total number of attendees for ICDCN 2011 in Bangalore reached 272, out of which 160 were students.

Besides the core technical program, ICDCN 2011 offered a number of other stimulating events. Before the main conference program, we had a full day of tutorial program. During the main conference, we were fortunate to have several distinguished scientists as keynote speakers. The main conference was further followed by several other exciting events including the Ph.D. forum.