# Table of Contents

The 2010 Edsger W. Dijkstra Prize in Distributed Computing .......... 1

**Invited Lecture I; Consensus (Session 1a)**

The Power of Abstraction *(invited lecture)* .............................. 3  
*Barbara Liskov*

Fast Asynchronous Consensus with Optimal Resilience ................... 4  
*Ittai Abraham, Marcos Aguilera, Dahlia Malkhi*

**Transactions (Session 1b)**

Transactions as the Foundation of a Memory Consistency Model .......... 5  
*Luke Dalessandro, Michael L. Scott, Michael F. Spear*

The Cost of Privatization .................................................... 20  
*Hagit Attiya, Eshcar Hillel*

A Scalable Lock-Free Universal Construction with Best Effort  
Transactional Hardware ...................................................... 35  
*Francois Carouge, Michael Spear*

Window-Based Greedy Contention Management for Transactional Memory 50  
*Gokarna Sharma, Brett Estrade, Costas Busch*

**Shared Memory Services and Concurrency (Session 1c)**

Scalable Flat-Combining Based Synchronous Queues ........................ 65  
*Danny Hendler, Itai Incze, nir shavit, Moran Tzafrir*

Fast Randomized Test-and-Set and Renaming .............................. 80  
*Dan Alistarh, Hagit Attiya, Seth Gilbert, Andrei Giurgiu, Rachid Guerraoui*

Concurrent Computing and Shellable Complexes .......................... 95  
*Maurice Herlihy, Sergio Rajsbaum*

**Brief Announcements I (Session 1d)**

Brief Announcement: Hybrid Time-based Transactional Memory .......... 110  
*Pascal Felber, Christof Fetzer, Patrick Marlier, Martin Nowack, Torvald Riegel*
Brief Announcement: Quasi-Linearizability: relaxed consistency for improved concurrency ................................................. 113
  Yehuda Afek, Guy Korland, Eitan Yanovsky

Brief Announcement: Fast Local-spin Abortable Mutual Exclusion with Bounded Space ................................................. 116
  Hyonho Lee

Wireless Networks (Session 1e)

What Is The Use Of Collision Detection (In Wireless Networks)? .......... 119
  Johannes Schneider, Roger Wattenhofer

Deploying Wireless Networks with Beeps ........................................ 134
  Alejandro Cornejo, Fabian Kuhn

Distributed Contention Resolution in Wireless Networks ................. 149
  Thomas Kesselheim, Berthold Vácking

A Jamming-Resistant MAC Protocol for Multi-Hop Wireless Networks .. 164
  Andrea Richa, Christian Scheideler, Stefan Schmid, Jin Zhang

Brief Announcements II (Session 1f)

Brief Announcement: Simple Gradecast Based Algorithms ............... 179
  Michael Ben-Or, Danny Dolev, Ezra N. Hoch

Brief Announcement: Decentralized Network Bandwidth Prediction ...... 182
  Sukhyun Song, Pete Keleher, Bobby Bhattacharjee, Alan Sussman

Brief Announcement: Synchronous Las Vegas URMT iff Asynchronous Monte Carlo URMT ............................................. 185
  Abhinav Mehta, Shashank Agrawal, Kannan Srinathan

Invited Lecture II; Best Student Paper (Session 2a)

Foundations of Speculative Distributed Computing (invited lecture) ...... 188
  Rachid Guerraoui

Anonymous Asynchronous Systems: the Case of Failure Detectors ...... 190
  François Bonnet, Michel Raynal

Consensus and Leader Election (Session 2b)

The Computational Structure of Progress Conditions ..................... 205
  Gadi Taubenfeld
Scalable Quantum Consensus for Crash Failures ................. 220
   Bogdan Chlebus, Dariusz Kowalski, Michal Stojnowski

How much memory is needed for leader election ..................... 235
   Emanuele Guido Fusco, Andrzej Pelc

Leader Election Problem Versus Pattern Formation Problem .......... 250
   Yoann Dieudonne, Franck Petit, Vincent Villain

Mobile Agents (Session 2c)

Rendezvous of Mobile Agents in Directed Graphs ................. 265
   Jeremie Chalopin, Shantanu Das, Peter Widmayer

Almost optimal asynchronous rendezvous in infinite multidimensional grids 280
   Evangelos Bampas, Jurek Czyzowicz, Leszek Gasieniec, David Ilcinkas,
   Arnaud Labourel

Exclusive Perpetual Ring Exploration without Chirality .......... 295
   Lelia Blin, Alessia Milani, Maria Gradinariu Potop-Butucaru, Sebastien
   Tixeuil

Drawing Maps with Advice ........................................ 310
   Dariusz Dereniowski, Andrzej Pelc

Invited Lecture III; Wireless Networks (Session 3a)

Network-Aware Distributed Algorithms: Challenges and Opportunities
in Wireless Networks (Invited Lecture Summary) (invited talk) ........ 325
   Nitin Vaidya

Connectivity Problem in Wireless Networks ........................ 326
   Dariusz Kowalski, Mariusz Rokicki

Computing in Wireless and Mobile Networks (Session 3b)

Trusted Computing for Fault-Prone Wireless Networks .......... 341
   Seth Gilbert, Dariusz Kowalski

Opportunistic Information Dissemination in Mobile Ad-hoc Networks:
The Profit of Global Synchrony .................................... 356
   Antonio Fernandez Anta, Alessia Milani, Miguel A. Mosteiro, Shmuel
   Zaks
Brief Announcements III (Session 3c)

Brief Announcement: Failure Detectors Encapsulate Fairness .......... 371
Scott M. Pike, Srikanth Sastry, Jennifer Welch

Francesco Alberti, Silvio Ghilardi, Elena Pagani, Silvio Ranise, Gian Paolo Rossi

Brief Announcement: On Reversible and Irreversible Conversions .... 377
Mitre Costa Dourado, Lucia Draque Penso, Dieter Rautenbach, Jayme Luiz Szwarcfiter

Brief Announcement: An Efficient Decentralized Algorithm for the Distributed Trigger Counting Problem ......................... 380
Venkatesan Chakaravarthy, Anamitra Choudhury, Vijay Garg, Yogish Sabharwal

Brief Announcement: Flash-Log: A High Throughput Log ............ 383
Mahesh Balakrishnan, Philip A. Bernstein, Dahlia Malkhi, Colin Reid, Vijayan Prabhakaran

Brief Announcement: New Bounds for Partially Synchronous Set Agreement ...................................................... 386
Dan Alistarh, Seth Gilbert, Rachid Guerraoui, Corentin Travers

Modeling Issues and Adversity (Session 3d)

It’s on Me! The Benefit of Altruism in BAR Environments .......... 388
Edmund Wong, Joshua Leners, Lorenzo Alvisi

Beyond Lamport’s Happened-before: On the Role of Time Bounds in Synchronous Systems .............................................. 403
Ido Ben-Zvi, Yoram Moses

On the Power of Non-Spoofing Adversaries ......................... 418
H B Acharya, Mohamed Gouda

Implementing Fault-Tolerant Services Using State Machines: Beyond Replication .................................................... 433
Vijay Garg

Self-Stabilizing and Graph Algorithms (Session 3e)

Low Communication Self-Stabilization Through Randomization ...... 448
Dmitry Zinenko, Shay Kutten
Fast Self-Stabilizing Minimum Spanning Tree Construction.............. 463
   Lelia Blin, Shlomi Dolev, Maria Gradinariu Potop-Butucaru, Stephane
   Rovedakis

The Impact of Topology on Byzantine Containment in Stabilization ..... 478
   Swan Dubois, Toshimitsu Masuzawa, Sebastien Tixeuil

Minimum Dominating Set Approximation in Graphs of Bounded
Arboricity .......................................................... 493
   Christoph Lenzen, Roger Wattenhöfer

Brief Announcements IV (Session 3f)

Brief Announcement: Sharing Memory in a Self-Stabilizing Manner...... 508
   Noga Alon, Hagit Attiya, Shlomi Dolev, Swan Dubios, Maria Gradinariu
   Potop-Butucaru, Sebastien Tixeuil

Brief Announcement: Stabilizing Consensus with the Power of Two
Choices .......................................................... 511
   Benjamin Doerr, Leslie Ann Goldberg, Lorenz Minder, Thomas Sauer-
   wald, Christian Scheideler