

Symposium on Algorithmic Principles of Computer Systems (APOCS21)

Held online due to COVID-19

Alexandria, Virginia, USA
13 January 2021

Editor:

Schapira Michael

ISBN: 978-1-7138-2710-8

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2021) by SIAM: Society for Industrial and Applied Mathematics
All rights reserved.

Printed with permission by Curran Associates, Inc. (2021)

For permission requests, please contact SIAM: Society for Industrial and Applied Mathematics
at the address below.

SIAM
3600 Market Street, 6th Floor
Philadelphia, PA 19104-2688 USA

Phone: (215) 382-9800
Fax: (215) 386-7999

siambooks@siam.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

Table of Contents

Session 1

Beyond Worst-case Analysis of Multicore Caching Strategies	1
Shahin Kamali and Helen Xu	
Mitigating False Positives in Filters: to Adapt or to Cache?	16
Michael A. Bender, Rathish Das, Martin Farach-Colton, Tianchi Mo, David Tench and Yung Ping Wang	
ReNets: Statically-Optimal Demand-Aware Networks	25
Chen Avin and Stefan Schmid	
Online Balanced Repartitioning of Dynamic Communication Patterns in Polynomial Time	40
Tobias Forner, Harald Räcke and Stefan Schmid	
On the Feasibility of Perfect Resilience with Local Fast Failover	55
Klaus-Tycho Foerster, Juho Hirvonen, Yvonne-Anne Pignolet, Stefan Schmid and Gilles Tredan	
The Read-Only Semi-External Model	70
Guy E. Blelloch, Laxman Dhulipala, Phillip B. Gibbons, Yan Gu, Charles McGuffey and Julian Shun	

Session 2

Approximate Aggregate Queries under Additive Inequalities	85
Mahmoud Abo-Khamis, Sungjin Im, Benjamin Moseley, Kirk Pruhs and Alireza Samadian	
A Relational Gradient Descent Algorithm for Support Vector Machine Training	100
Mahmoud Abo-Khamis, Sungjin Im, Benjamin Moseley, Kirk Pruhs and Alireza Samadian	
Parallel In-Place Algorithms: Theory and Practice	114
Yan Gu, Omar Obeya and Julian Shun	
Parallel Batch-Dynamic k-Clique Counting	129
Laxman Dhulipala, Quanquan C. Liu, Julian Shun and Shangdi Yu	
PARAD: A Work-Efficient Parallel Algorithm for Reverse-Mode Automatic Differentiation	144
Tim Kaler, Tao B. Schardl, Brian Xie, Charles E. Leiserson, Jie Chen, Aldo Pareja and Georgios Kollias	