2020 19th International Symposium on Parallel and Distributed Computing (ISPDC 2020)

Warsaw, Poland 5-8 July 2020



IEEE Catalog Number: ISBN: CFP20337-POD 978-1-7281-8947-5

Copyright © 2020 by the Institute of Electrical and Electronics Engineers, Inc. All Rights Reserved

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

*** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.

| IEEE Catalog Number: | |
|-------------------------|--|
| ISBN (Print-On-Demand): | |
| ISBN (Online): | |
| ISSN: | |

CFP20337-POD 978-1-7281-8947-5 978-1-7281-8946-8 2379-5352

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 E-mail: curran@proceedings.com Web: www.proceedings.com



2020 19th International Symposium on Parallel and Distributed Computing (ISPDC) **ISPDC 2020**

Table of Contents

| Message from the ISPDC 2020 Chairs ix |
|---------------------------------------|
| Organizing Committee x |
| Program Committee xi |
| Steering Committee xiii |
| Keynote Authors xiv |
| Sponsors xix |

Keynote Session 5 Paper

Optimal Matrix Partitioning for Data Parallel Computing on Hybrid Heterogeneous Platforms .1..... Tania Malik (University College Dublin) and Alexey Lastovetsky (University College Dublin)

Session 1 Papers

Session 2 Papers

| Generating Minimal Nondeterministic Finite Automata Using a Parallel Algorithm .37 Tomasz Jastrzab (Silesian University of Technology), Zbigniew J. Czech (Silesian University of Technology), and Wojciech Wieczorek (Silesia University in Katowice) |
|--|
| Compiler Assisted Source Transformation of OpenMP Kernels .44. Jannek Squar (Universität Hamburg), Tim Jammer (Technische Universität Darmstadt), Michael Blesel (Universität Hamburg), Michael Kuhn (Universität Hamburg), and Thomas Ludwig (Deutsches Klimarechenzentrum) |
| Evaluation of SIMD Instructions on Bio-Inspired Algorithms .52 Natiele Lucca (Federal University of Pampa) and Claudio Schepke (Federal University of Pampa) |
| Robustness Analysis of Scaled Resource Allocation Models Using the Imperial PEPA Compiler .6Q William S. Sanders (Mississippi State University), Srishti Srivastava (University of Southern Indiana), and Ioana Banicescu (Mississippi State University) |

Session 3 Papers

Session 4 Papers

On-the-fly Optimization of Parallel Computation of Symbolic Symplectic Invariants .102...... Joseph Ben Geloun (Université Sorbonne Paris Nord), Camille Coti (Université Sorbonne Paris Nord), and Allen D. Malony (University of Oregon)

Semantically Correct and Intent Defined Commutativity in Distributed Systems .110..... *Courtney Robinson (University of Greenwich)*

| Towards a Cloud Native Big Data Platform using MiCADO .118 |
|---|
| Abdelkhalik Mosa (University of Westminster), Tamas Kiss (University |
| of Westminster), Gabriele Pierantoni (University of Westminster), |
| James DesLauriers (University of Westminster), Dimitrios Kagialis |
| (University of Westminster), and Gabor Terstyanszky (University of |
| Westminster) |
| Provisioning Spot Instances Without Employing Fault-Tolerance Mechanisms .126 |
| Abdullah Alourani (University of Illinois at Chicago; Majmaah |
| University) and Ajay D. Kshemkalyani (University of Illinois at |
| Chicago) |

Session 5 Papers

| Dynamic Load Balancing Based on Multi-Objective Extremal Optimization .134 Ivanoe De Falco (Institute of High Performance Computing and Networking, CNR), Eryk Laskowski (Institute of Computer Science PAS), Richard Olejnik (Universite Lille - CRISTAL, CNRS), Umberto Scafuri (Institute of High Performance Computing and Networking, CNR), Ernesto Tarantino (Institute of High Performance Computing and Networking, CNR), and Marek Tudruj (Institute of Computer Science PAS; Polish-Japanese Institute of Information Technology) |
|--|
| Distributed and Fault-Tolerant Construction of Low Stretch Spanning Tree .142 Aishwarya Gurjar (Indian Institute of Technology Hyderabad), Sathya Peri (Indian Institute of Technology Hyderabad), and Sinchan Sengupta (Indian Institute of Technology Hyderabad) |
| Multivariate Performance and Power Prediction of Algorithms on Simulation-Based Hardware Models .150. Amit Mankodi (Dhirubhai Ambani Institute of Information and Communication Technology), Amit Bhatt (Dhirubhai Ambani Institute of Information and Communication Technology), and Bhaskar Chaudhury (Dhirubhai Ambani Institute of Information and Communication Technology) |
| Accelerated Implementation of FQSqueezer Novel Genomic Compression Method .158 Monica Amich (University of Campania Luigi Vanvitelli), Pasquale De Luca (University of Salerno), and Stefano Fiscale (University of Naples Parthenope) |

Session 6 Papers

| Development and Benchmarking a Parallel Data AcQuisition Framework using MPI with Hash and |
|--|
| Hash+Tree Structures in a Cluster Environment 164 |
| Paweł Czarnul (Gdańsk University of Technology), Grzegorz Gołaszewski |
| (Gdańsk University of Technology), Grzegorz Jereczek (Intel Technology |
| Paweł Czarnul (Gdańsk University of Technology), Grzegorz Gołaszewski (Gdańsk University of Technology), Grzegorz Jereczek (Intel Technology Poland), and Maciej Maciejewski (Intel Technology Poland) |
| |

Experimental Results Regarding the Workload of Many-Core Mobile Devices .172..... Matthieu Pilaudeau (EFREI) and Dan Grigoras (University College Cork)

| Thread Affinity in Software Transactional Memory .180 |
|---|
| Douglas Pereira Pasqualin (Universidade Federal de Pelotas), Matthias |
| Diener (University of Illinois at Urbana-Champaign), André Rauber Du |
| Bois (Universidade Federal de Pelotas), and Maurício Lima Pilla |
| (Universidade Federal de Pelotas) |
| Efficient Parallel Shortest Paths Algorithms .188 |
| David R. Alves (University of Texas at Austin), Madan S. Krishnakumar |
| (University of Texas at Austin), and Vijay K. Garg (University of |
| |
| Texas at Austin) |
| Texas at Austin) |

Author Index 197