Communications in Computer and Information Science 979

Commenced Publication in 2007
Founding and Former Series Editors:
Phoebe Chen, Alfredo Cuzzocrea, Xiaoyong Du, Orhun Kara, Ting Liu, Krishna M. Sivalingam, Dominik Ślęzak, and Xiaokang Yang

Editorial Board Members

More information about this series at http://www.springer.com/series/7899

Esteban Meneses · Harold Castro ·
Carlos Jaime Barrios Hernández ·
Raul Ramos-Pollan (Eds.)

High Performance Computing

5th Latin American Conference, CARLA 2018
Bucaramanga, Colombia, September 26–28, 2018
Revised Selected Papers

Springer

Editors
Esteban Meneses
Instituto Tecnológico de Costa Rica
Centro Nacional de Alta Tecnología
Pavas, Costa Rica

Carlos Jaime Barrios Hernández
Universidad Industrial de Santander
Bucaramanga, Colombia

Harold Castro
Universidad de los Andes
Bogotá, Colombia

Raul Ramos-Pollan
Universidad de Antioquia
Medellín, Colombia

ISSN 1865-0929 ISSN 1865-0937 (electronic)
Communications in Computer and Information Science
ISBN 978-3-030-16204-7 ISBN 978-3-030-16205-4 (eBook)
https://doi.org/10.1007/978-3-030-16205-4

Library of Congress Control Number: 2019935812

This Springer imprint is published by the registered company Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Preface

The use and development of high-performance computing (HPC) in Latin America is steadily growing. New challenges come from the capabilities provided by clusters, grids, and distributed systems for HPC, promoting research and innovation in many scientific disciplines. Building on the great success of the previous editions, the Latin American Conference on High-Performance Computing (CARLA 2018) was held in Bucaramanga, Colombia, during September 26–28. The main goal of CARLA 2018 was to provide a regional forum to foster the growth of the HPC community in Latin America through the exchange and dissemination of new ideas, techniques, and research projects. The conference featured invited talks from academy and industry as well as short- and full-paper sessions presenting both mature work and new ideas in research and industrial applications.

The list of topics included: parallel algorithms; multicore architectures and accelerators; parallel programming techniques; cluster, grid, cloud, fog, and edge computing; federations; HPC education and outreach; HPC infrastructure and data centers; large-scale distributed systems; scientific and industrial computing; modeling and evaluation; high-performance applications and tools; data analytics, data management, and data visualization; AI; machine learning; deep learning; and special topics in advanced computing.

All submitted papers were carefully examined by at least three reviewers. Out of the 38 submissions received, 24 were accepted to be presented at the conference.

March 2019

Esteban Meneses
Harold Castro
Carlos Jaime Barrios Hernández
Raul Ramos-Pollan

Organization

Steering Committee

Mateo Valero	Barcelona Supercomputing Center, Spain
Gonzalo Hernández	University of Santiago, Chile
Carla Osthoff	National Laboratory for Scientific Computing, Brazil
Philippe Navaux	Federal University of Rio Grande do Sul, Brazil
Isidoro Gitler	Center for Research and Advanced Studies of the National Polytechnic Institute, Mexico
Esteban Mocskos	University of Buenos Aires, Argentina
Nicolas Wolovick	National University of Cordoba, Argentina
Sergio Nesmachnow	University of the Republic, Uruguay
Alvaro de la Ossa Osegueda	University of Costa Rica, Costa Rica
Esteban Meneses	National High Technology Center, Costa Rica
Carlos Jaime Barrios Hernández	Industrial University of Santander, Colombia
Harold Enrique Castro Barrera	University of Los Andes, Colombia
Gilberto Javier Diaz Toro	Industrial University of Santander, Colombia
Luis Alberto Nunez de Villavicencio Martinez	Industrial University of Santander, Colombia

Program Committee

Alvaro Coutinho	Federal University of Rio de Janeiro, Brazil
Bruno Schulze	National Laboratory for Scientific Computing, Brazil
Carla Osthoff	National Laboratory for Scientific Computing, Brazil
Daniel Cordeiro	University of São Paulo, Brazil
Esteban Clua	Federal Fluminense University, Brazil
Lucas Schnorr	Federal University of Rio Grande do Sul, Brazil
Marcio Castro	Federal University of Santa Catarina, Brazil
Pedro Mario Cruz Silva	NVIDIA, Brazil
Roberto Pinto-Souto	National Laboratory for Scientific Computing, Brazil
Luiz Angelo Steffenel	Université de Reims Champagne-Ardenne, France
Luiz Derose	Cray, USA
Ginés Guerrero	University of Chile, Chile
Claudia Jiménez-Guarín	University of the Andes, Colombia
Fabio Martinez Carrillo	National University of Colombia, Colombia
Gilberto Javier Diaz Toro	Industrial University of Santander, Colombia
Idalides Vergara-Laurens	University of Turabo, Colombia
Julian Ernesto Jaramillo	Industrial University of Santander, Colombia
Luis Fernando Castillo	University of Caldas, Colombia

Edmanuel Torres	Canadian Nuclear Laboratories, Canada
Cristian Camilo Ruiz Sanabria	Industrial University of Santander, Colombia
Esteban Hernandez Barragan	csddlabs, Colombia
Esteban Meneses	National High Technology Center, Costa Rica
Filip Krikava	Czech Technical University, Czech Republic
Guilherme Peretti-Pezzi	Swiss National Supercomputing Centre, Switzerland
Leonardo A. Bautista Gomez	Barcelona Supercomputing Center, Spain
Bruno Raffin	Laboratoire Informatique et Distribution, France
Claudia Roncancio	Grenoble University, France
Genoveva Vargas-Solar	CNRS-LIG-LAFMIA, France
Laercio Lima-Pilla	University of Paris-Sud, CNRS, France
Michel Riveill	University of Nice, France
Olivier Richard	LIG Laboratory Grenoble, France
Oscar Carrillo	CPE Lyon, France
Rafael Escovar	ASML, France
Thomas Ropars	University of Grenoble-Alpes, France
Yves Denneulin	University of Grenoble-Alpes, France
Matthieu Dreher	Canadian Bank Note, Canada
Xavier Besseron	University of Luxembourg, Luxembourg
Benjamin Hernandez	Oak Ridge National Laboratory, USA
Isidoro Gitler	Center for Research and Advanced Studies of the National Polytechnic Institute, Mexico
Jaime Klapp	National Institute for Nuclear Research, Mexico
José Luis Gordillo	National University of Mexico, Mexico
Ulises Cortés	Universitat Politècnica de Catalunya, Spain
Nicolás Erdödy	Open Parallel Ltd, New Zealand
Eduardo Fernandez	University of the Republic, Uruguay
Eduardo Rodrigues	IBM, Brazil
Ernesto Bautista	DES-DACI, Universidad Autónoma del Carmen, Uruguay
German Schynder	University of the Republic, Uruguay
Gonzalo Tancredi	University of the Republic, Uruguay
Horacio Paggi	Universidad Politécnica de Madrid, Spain
Luka Stanisic	Max Planck Computing and Data Facility, Germany
Martin Pedemonte	University of the Republic, Uruguay
Pablo Ezzati	University of the Republic, Uruguay
Renzo Massobrio	University of the Republic, Uruguay
Sergio Nesmachnow	University of the Republic, Uruguay
Ulises Orozco-Rosas	Universidad Rey Juan Carlos, Spain
Ignacio Laguna	Lawrence Livermore National Laboratory, USA
Nick Nystrom	Pittsburgh Supercomputing Center, USA
Pablo Guillen	University of Houston, USA

Contents