

2020 IEEE/ACM International Workshop on Heterogeneous High-performance Reconfigurable Computing (H2RC 2020)

**Atlanta, Georgia, USA
13 November 2020**



**IEEE Catalog Number: CFP20W49-POD
ISBN: 978-1-6654-1593-4**

**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:	CFP20W49-POD
ISBN (Print-On-Demand):	978-1-6654-1593-4
ISBN (Online):	978-1-6654-1592-7

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

CURRAN ASSOCIATES INC.
proceedings
.com

2020 IEEE/ACM International Workshop on Heterogeneous High-performance Reconfigurable Computing (H2RC) **H2RC 2020**

Table of Contents

Message from the Workshop Chairs .v.....	
Workshop Organization .vi.....	

Technical Papers

Programming Reconfigurable Heterogeneous Computing Clusters Using MPI with Transpilation .1...	
<i>Burkhard Ringlein (IBM Research Europe), Francois Abel (IBM Research Europe), Alexander Ditter (Friedrich-Alexander University Erlangen-Nürnberg), Beat Weiss (IBM Research Europe), Christoph Hagleitner (IBM Research Europe), and Dietmar Fey (Friedrich-Alexander University Erlangen-Nürnberg)</i>	
Evaluating FPGA Accelerator Performance with a Parameterized OpenCL Adaptation of Selected Benchmarks of the HPCChallenge Benchmark Suite .10.....	
<i>Marius Meyer (Paderborn University), Tobias Kenter (Paderborn University), and Christian Plesl (Paderborn University)</i>	
Exploring the Acceleration of Nekbone on Reconfigurable Architectures .19.....	
<i>Nick Brown (EPCC at the University of Edinburgh)</i>	
FPGA Acceleration of Fluid-Flow Kernels .29.....	
<i>Ryan Blanchard (University of Florida, USA), Greg Stitt (University of Florida, USA), and Herman Lam (University of Florida, USA)</i>	
FPGA-as-a-Service Toolkit (FaaS) .38.....	
<i>Dylan Sheldon Rankin (Massachusetts Institute of Technology), Jeffrey Krupa (Massachusetts Institute of Technology), Philip Harris (Massachusetts Institute of Technology (MIT)), Maria Acosta (Fermi National Accelerator Laboratory), Burt Holzman (Fermi National Accelerator Laboratory), Thomas Klijnsma (Fermi National Accelerator Laboratory), Kevin Pedro (Fermi National Accelerator Laboratory), Nhan Tran (Fermi National Accelerator Laboratory), Scott Hauck (University of Washington), Shih-Chieh Hsu (University of Washington), Matthew Trahms (University of Washington), Kelvin Lin (University of Washington), Yu Lou (University of Washington), Ta-Wei Ho (National Tsing Hua University), Javier Duarte (University of California, San Diego), and Mia Liu (Purdue University)</i>	

OpenCL-Enabled Parallel Raytracing for Astrophysical Application on Multiple FPGAs with
Optical Links 48.....

Norihisa Fujita (Center for Computational Sciences, University of Tsukuba), Ryohei Kobayashi (Center for Computational Sciences, University of Tsukuba), Yoshiki Yamaguchi (Degree Program in Systems and Information Engineering, University of Tsukuba), Taisuke Boku (Center for Computational Sciences, University of Tsukuba), Kohji Yoshikawa (Degree Program in Pure and Applied Sciences, University of Tsukuba), Makito Abe (Center for Computational Sciences, University of Tsukuba), and Masayuki Umemura (Degree Program in Pure and Applied Sciences, University of Tsukuba)

Author Index 57.....