2014 5th Workshop on Latest Advances in Scalable Algorithms for Large-Scale Systems

(ScalA 2014)

New Orleans, Louisiana, USA
17 November 2014
2014 5th Workshop on Latest Advances in Scalable Algorithms for Large-Scale Systems

ScalA 2014

Table of Contents

Workshop Overview...........................................................................................................................................v
ScalA'14 Foreword..........................................................................................................................................vi

Technical Papers

Scaling Parallel 3-D FFT with Non-Blocking MPI Collectives ..............................................................1
   Sukhyun Song and Jeffrey K. Hollingsworth
Exploiting Data Representation for Fault Tolerance ...................................................................... 9
   James Elliott, Mark Hoemmen, and Frank Mueller
VCube: A Provably Scalable Distributed Diagnosis Algorithm ....................................................17
   Elias P. Duarte, Luis C. E. Bona, and Vinicius K. Ruoso
TX: Algorithmic Energy Saving for Distributed Dense Matrix Factorizations ..................................23
   Li Tan and Zizhong Chen
CholeskyQR2: A Simple and Communication-Avoiding Algorithm
for Computing a Tall-Skinny QR Factorization on a Large-Scale Parallel System ..............................................31
   Takeshi Fukaya, Yuji Nakatsukasa, Yuka Yanagisawa, and Yusaku Yamamoto
Deflation Strategies to Improve the Convergence of Communication-Avoiding GMRES .................39
   Ichitaro Yamazaki, Stanimire Tomov, and Jack Dongarra
A Framework for Parallel Genetic Algorithms for Distributed Memory Architectures ..................47
   Dobromir Georgiev, Emanouil Atanassov, and Vassil Alexandrov
The Anatomy of Mr. Scan: A Dissection of Performance of an Extreme Scale GPU-Based Clustering Algorithm ..........................................................54
   Benjamin Welton and Barton P. Miller
Performance and Portability with OpenCL for Throughput-Oriented HPC
Workloads across Accelerators, Coprocessors, and Multicore Processors ...........................................61
Chongxiao Cao, Mark Gates, Azzam Haidar, Piotr Luszczek, Stanimire Tomov,
and Ichitaro Yamazaki

A Hierarchical Tridiagonal System Solver for Heterogenous Supercomputers .....................................69
Xinliang Wang, Yangtong Xu, and Wei Xue

Author Index ..................................................................................................................................................77