

Ronak Akshay Buch

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Education



University of Illinois at Urbana-Champaign, Urbana, Illinois

In Progress

Ph.D. Computer Science

Advisor: Laxmikant Kale

Architecture, Parallel Computing, and Systems



The Ohio State University, Columbus, Ohio

June 2012

B.S. Computer Science and Engineering, Minor in Mathematics

Summa Cum Laude, With Honors in Engineering

Publications

Halie Rando, Marta Farré, Michael P. Robson, Naomi B. Won, Jennifer L. Johnson, **Ronak Buch**, Estelle R. Bastounes, et al. *Construction of Red Fox Chromosomal Fragments from the Short-Read Genome Assembly*. Genes 9, no. 6 (2018).

Bilge Acun, **Ronak Buch**, Laxmikant Kale, and James C. Phillips. *NAMD: Scalable Molecular Dynamics Based on the Charm++ Parallel Runtime System*. In Tjerk P. Straatsma, Katerina B. Antypas, and Timothy J. Williams (Eds.), *Exascale Scientific Applications: Scalability and Performance Portability* (2017). CRC Press.

Michael P. Robson, **Ronak Buch**, and Laxmikant V. Kale. *Runtime Coordinated Heterogeneous Tasks in Charm++*. Second International Workshop on Extreme Scale Programming Models and Middleware (ESPM2 '16).

Abhinav Bhatele, Nikhil Jain, Katherine Isaacs, **Ronak Buch**, Todd Gamblin, Steven H. Langer, and Laxmikant V. Kale. *Optimizing the Performance of Parallel Applications on a 5D Torus via Task Mapping*. IEEE International Conference on High Performance Computing (HiPC '14).

Talks

Recent Topics in Dynamic Load Balancing, 16th Annual Workshop on Charm++ and its Applications.

Selected Topics in Dynamic Load Balancing, 15th Annual Workshop on Charm++ and its Applications.

Performance Analysis and Projections, 5th Joint Laboratory for Extreme-Scale Computing Workshop.

Performance Analysis and Projections, 14th Annual Workshop on Charm++ and its Applications.

Advanced Techniques in Performance Analysis, 11th Workshop of the INRIA-Illinois-ANL Joint Laboratory on Petascale Computing.

Teaching Experience

Laxmikant Kale, Michael Robson, **Ronak Buch**, and Jaemin Choi. *Migratable Objects and Task-Based Parallel Programming with Charm++* (Tutorial). International Conference for High Performance Computing, Networking, Storage and Analysis (SC '17).

Performance Analysis in Charm++ - Tutorial of 15th Annual Workshop on Charm++ and its Applications

HPC Applications Performance Analysis and Debugging - Summer School of 11th Workshop of the INRIA-Illinois-ANL Joint Laboratory on Petascale Computing

Teaching Assistant - CS125: Introduction to Computer Science

Led discussion sections on basics of programming, recursion, data structures, and other topics

Ranked "Excellent" by students

Work Experience



Lawrence Livermore National Laboratory, Livermore, California
Institute for Scientific Computing Research Scholar

Summer 2013

Designed and developed network contention detection scheme for supercomputer networks
 Developed network simulator for testing of network contention schemes
 Studied communication performance of MPI, PAMI, and SPI on Blue Gene/Q



Microsoft, Redmond, Washington
Software Development Engineer Intern

Summer 2011

Developed immersive music application for demoing the C++ development process in Windows 8
 Tested alpha APIs and development experience for Windows 8 applications
 Software presented at 2011 BUILD Conference



Rapleaf, San Francisco, California
Software Engineer Intern

Spring 2011

Modified Java database code to couple with Ruby's ActiveRecord
 Developed education level inference system based on location
 Developed internal collaboration website using Ruby on Rails



MIT Lincoln Laboratory, Lexington, Massachusetts
Summer Research Intern

Summer 2010

Redesigned, optimized, and parallelized weather forecasting software using PThreads and OpenMP
 Conducted explorative study on porting algorithms to GPGPU systems



Science Applications International Corporation, Beaver Creek, Ohio
Software Engineer Intern

Summer 2009

Developed a cross-platform suite of motion imagery exploitation tools for unmanned aerial vehicles
 Created and maintained virtual machine infrastructure for databases, servers, and video streams
 Authored technical documentation for system administrators, end-users, and internal testing

Honors, Awards, & Scholarships

Best Senior Capstone Project, 2012
 Phi Kappa Phi, National Honor Society, 2010
 Tau Beta Pi, National Engineering Honor Society, 2010
 Ohio State Presidential Scholarship, 2008
 Procter & Gamble Mathematics Scholarship, 2008
 FIRST Robotics Scholarship, 2008
 National Merit Scholar, 2008

Service

Graduate College Representative, Senate of the Urbana-Champaign Campus, 2016-2017
 Graduate College Representative, UIUC Student Senate, 2016-2017
 UIUC Graduate Admissions Committee, 2015
 UIUC Graduate Ambassador, 2013 - 2018
 UIUC Graduate Mentor, 2013 - 2017
 Harrison & Scott Awards Review Committee, Ohio State College of Engineering, 2010
 FIRST Robotics Mentor, 2010