

van de Geijn RA and Watts J (1997) SUMMA: scalable universal matrix multiplication algorithm. *Concurrency: Practice and Experience* 9(4): 255–274.

Wilkinson KA, Sherwood P, Guest MF and Naidoo KJ (2011) Acceleration of the GAMESS-UK electronic structure package on graphical processing units. *Journal of Computational Chemistry* 32(10): 2313–2318.

Yasuda K (2008) Two-electron integral evaluation on the graphics processor unit. *Journal of Computational Chemistry* 29(3): 334–342.

Author biographies

Edmond Chow is an Associate Professor in the School of Computational Science and Engineering in the College of Computing at Georgia Institute of Technology, and has previously held positions at D. E. Shaw Research and Lawrence Livermore National Laboratory. His general area of research is in developing and applying numerical methods and high-performance computing to solve large-scale scientific computing problems. He was awarded the ACM Gordon Bell prize (2009) and the Presidential Early Career Award for Scientists and Engineers (2002), and serves as Associate Editor for *SIAM Journal on Scientific Computing* and *ACM Transactions on Mathematical Software*.

Xing Liu is a Research Staff Member in the High Performance Analytics Department at the T. J. Watson Research Center. He received his PhD degree in Computational Science and Engineering from Georgia Institute of Technology in 2014. His research interests include high-performance computing, parallel algorithms, numerical methods, sparse linear algebra, quantum chemistry, hydrodynamic simulations, and GPU-based computing.

Sanchit Misra is a Research Scientist at the Parallel Computing Labs, Intel, Bangalore. His research interests include computational biology, next-generation sequencing, high-performance computing, architecture-specific optimizations and algorithms. Currently, he is working on architecture specific optimizations of key computational biology kernels by using state-of-the-art parallel programming techniques. He earned a PhD in Computer Engineering from Northwestern University in 2011. Prior to that, he got his BTech from IIT Kharagpur in 2005. He worked at Trilogy, Bangalore from 2005–2006. While at Northwestern, Sanchit has been on summer internships at Intel (2007) and Google (2010).

Marat Dukhan is a PhD student in Computational Science and Engineering at the Georgia Tech's College of Computing. His research interests are in

high-performance computing, data analysis, and their interaction.

Mikhail Smelyanskiy is a Senior Research Scientist at Intel Labs and a member of the IEEE. His research focus is on building and analyzing parallel emerging workloads to drive the design of the next-generation parallel architectures. He received his PhD from the University of Michigan, Ann Arbor.

Jeff Hammond is a Research Scientist in the Parallel Computing Lab at Intel Labs. His research interests include: one-sided and global view programming models, load-balancing for irregular algorithms, shared- and distributed-memory tensor contractions, and the simulation of physical phenomena, primarily the behavior of molecules and materials at atomistic resolution, with massively parallel computing. Previously, Jeff was an Assistant Computational Scientist at the Argonne Leadership Computing Facility and a Fellow of the University of Chicago Computation Institute. He was a Director's Postdoctoral Fellow at Argonne from 2009 to 2011. In 2009, he received his PhD in chemistry from the University of Chicago as a Department of Energy Computational Science Graduate Fellow. He graduated from the University of Washington with degrees in chemistry and mathematics in 2003. The IEEE Technical Committee on Scalable Computing named him a Young Achiever in Scalable Computing in 2014 for his work on massively parallel scientific applications and runtime systems.

Yunfei Du received his doctoral degree from National University of Defense Technology, China, in 2008. His research interests focus on parallel and distributed systems, fault tolerance, and scientific computing. He is an associate professor in the College of Computer Science at National University of Defense Technology.

Xiangke Liao is Professor and Dean of the College of Computer Science at National University of Defense Technology (NUDT), Changsha, China. He received the BS degree in computer science from Tsinghua University, China and the MS degree in computer science from NUDT. His research interests include high-performance computing systems, operating systems, and parallel software. He is the chief designer of Tianhe-2 system.

Pradeep Dubey is an Intel Fellow and Director of Parallel Computing Lab (PCL), part of Intel Labs. His research focus is computer architectures to efficiently handle new compute-intensive application paradigms for the future computing environment. He previously worked at IBM's T. J. Watson Research Center, and

Broadcom Corporation. He has made contributions to the design, architecture, and application performance of various microprocessors, including IBM Power PC*, Intel i386TM, i486TM, Pentium Xeon, and the Xeon Phi line of processors. He holds over 36 patents, has published over 100 technical papers, won the Intel

Achievement Award in 2012 for Breakthrough Parallel Computing Research, and was honored with Outstanding Electrical and Computer Engineer Award from Purdue University in 2014. He received a PhD in electrical engineering from Purdue University. He is a Fellow of IEEE.