Bitwise Reproducibility Perspectives and Latest Advances

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Agenda

35 minutes each

Presentation and/or code walkthrough + take home component for follow-up

8a-8:05a – Intro: Noah Clemons

8:05a-8:40a – MKL: Greg Henry & Zhang Zhang

8:45a-9:20a – Fortran: Steve Lionel

9:25a-9:50a – Numerical Algorithms Group: Mick Pont

10:00a-10:30a – **COFFEE BREAK in the 200 aisle. Note: we will need to walk there from the 300 area.**

10:30a-11:05a – National Lab Codes: Rob Robey

11:10a-11:45a – Latest Research Methods – Diep Nguyen

MKL

Greg Henry is a principal engineer and senior developer in the Intel® Math Kernel Library group. He got his Ph.D. from Cornell and joined Intel Supercomputing Systems division in 1993, has attended nearly every supercomputing conference, and a twice-recipient of Gordon Bell prizes from previous years. He contributed to the ScaLAPACK project and his research interests include numerical linear algebra. He helped tuned LINPACK and BLAS libraries from the world's first Teraflop machine in 1996 to the current top machine, Tianhe-2. He currently lives in Oregon, USA, has a fourth degree black belt in Taekwondo and has written eleven novels.

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MKL

Zhang Zhang is a Technical Consulting Engineer in the Developer Products Division within the Software and Services Group. He provides technical support for Intel® Math Kernel Library (Intel® MKL). He focuses on enabling customers to adopt Intel® MKL and helping them to get the performance advantages of the library. Zhang came from a background of high performance computing and parallel programing tools design and implementation. Before joining Intel, Zhang worked for Cadence Design Systems and AOL, where he developed and optimized distributed computing frameworks for large-scale engineering applications and big data analytics. Zhang holds a Ph.D. in Computer Science from Michigan Technological University.

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FORTRAN

Steve Lionel is a Senior Technical Consulting Engineer at Intel, specializing in Fortran compilers. Over his 35 year career he has been a compiler and operating system developer and now is in Intel's compiler support team. Steve is active in online Fortran forums, blogs as "Doctor Fortran" at Intel Developer Zone and is @DoctorFortran on Twitter.

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NAG

Mick Pont is a Principal Technical Consultant with the Numerical Algorithms Group (NAG) in Oxford. He has been with NAG since 1984, working on various things including test software for floating-point arithmetic, visualization packages, and numerical library software, and is currently deputy manager of NAG's Development Division.

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National Lab Codes

Bob Robey is a Research Scientist in the Eulerian Applications group at Los Alamos National Laboratory. He is the lead author of CLAMR mini-app, an open source adaptive mesh refinement shallow water hydrocode. Some of his interests include parallel algorithm research and computational physics methods research. He has over 20 years of experience in shock wave research including the operation of large explosively driven shock tubes and writing compressible fluid dynamics codes. He helped establish the High Performance Computing Center at the University of New Mexico and the Maui High Performance Computing Center. He has been one of the key contributors to the 2011 X Division Summer Workshop program. He is currently Board President of the New Mexico Supercomputing Challenge, a high school and middle school computational modeling program that has been going for 25 years.

Research Methods

Dr. Diep Nguyen received his PhD degree in 2011 from ENS Lyon, where he did his study on Interval arithmetic. Since then, he has been working as a postdoctoral researcher at UC Berkeley under the supervision of Prof. James Demmel. His main topics are: floating point arithmetic, numerical analysis, communication-avoiding algorithms and reproducibility of floating point computation.

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