

INTEL® PARALLEL COMPUTING CENTERS



April 2018 Newsletter

Highlights



Optimization Techniques

[nGraph: A New Open Source Compiler for Deep Learning Systems](#): Framework-neutral Deep Neural Network model compiler targeted for a variety of devices. Data scientists no longer have to worry about adapting their DNN models to train and run efficiently on different devices.

[Building FreeFEM++ with Intel Software tools for developers](#): FreeFEM++ is targeted for solving partial differential equations and getting additional optimization performance benefits on Intel platforms using Intel® Parallel Studio XE.

[LIBXSMM: Look Inside at Top-Notch Low-Level Software Primitives](#): LIBXSMM is a library targeting Intel Architecture for small, dense or sparse matrix multiplications, and small convolutions, using Just-In-Time in-memory code-generation. LIBXSMM services a scratch memory allocation to accelerate applications that rely on temporary storage (TensorFlow).

[Vectorization Quality: How well is your C code compiled](#): Performance relies heavily on the degree of vectorization of the loops. Sharing techniques written in C without intrinsics or directives that are shown to evaluate of the machine code generated by various compilers.

[GPAW performance optimization and energy consumption](#): Improving vectorization through computational kernels for best practices in optimal porting. Results showing up to ~18% speedup using OpenMP SIMD pragmas to guide vectorization with measured energy consumption usage.



Case Studies

[Performance Evaluation of Omni XcalableMP Compiler on Many-core Cluster System](#): Performance tuning methods for Omni compiler using Lattice QCD mini-application. Ultimately, reducing programming cost on a cluster system using Partitioned Global Address Space (PGAS) languages.

[Optimizations Techniques for VLPL-S Particle-in-cell Code](#): Addressing data I/O and unbalanced computational load by focusing on computational optimizations (memory access optimization, thread level parallelism, and vectorization), parallel I/O and dynamic load balancing optimization.



Science
Breakthrough

[Artificial Intelligence Helps with Skin Cancer Screening:](#) Skin cancer has reached epidemic proportions and a simple test is needed to perform initial screening on a wide scale to encourage individuals to seek treatment when necessary. Something that operates in real time, relies on an extensive library of images to distinguish between skin cancer and benign lesions, making it easier for people to seek professional medical advice.

[Devito - Automated High-Performance Finite-Difference for Geophysical Exploration:](#) Open-source framework for solving partial differential equations from symbolic problem definitions by the finite difference method. Generating highly optimized stencil operators for seismic inversion problems using a few Python lines, achieving performance portability by using advanced compiler technology.

Testing your code on Intel® Architecture

We encourage Intel® PCC members to test their code using various configurations of Intel® architecture (i.e. Intel® Xeon processor, Intel® Xeon Phi™ processor, Intel® Omni-Path, etc. Click [HERE](#) to test your optimized application using TACC, Stampede II system. Upon requesting access, create a new account (do not click on PI-eligible) and follow the email instructions. Then email the ipcc.program.office@intel.com account and include your username in the communication.

Call for Abstracts –Submit NOW!

Share your learnings, best practices and techniques around the benefits you've received in leveraging Intel® architecture, by participating in speaking opportunities. Also, submit abstracts for funding opportunities by the deadline.

Submission Deadline	Event
April 8, 2018	ALCF Aurora 2021 Early Science Program: Data and Learning
April 15, 2018	ACM Gordon Bell
April 15, 2018	IXPUG ISC18 Workshop
April 16, 2018	SC18 Tutorials
April 17, 2018	O'REILLY Artificial Intelligence Conference
April 30, 2018	IEEE Visualization Conference 2018 Tutorials
June 1, 2018	James H. Wilkinson Prize for Numerical Software
June 5, 2018	SIGGRAPH ASIA 18 Papers
June 16, 2018	IEEE Visualization Conference 2018 Short Paper
June 16, 2018	IEEE Visualization Conference 2018 Posters
June 28, 2018	ISC18 IXPUG Workshop
June 30, 2018	Amazon Web Services Grants
July 13, 2018	IXPUG Fall conference Technical Lecture, Lightning Talk, Tutorial, Poster
July 31, 2018	SC18 Poster
July 31, 2018	SC18 BoF

Global Training Opportunities

Join us at any of these upcoming educational workshops and conferences and learn about new Parallel Programming concepts, Intel® Libraries, Software Development tools and Artificial Intelligence frameworks. They are open to the public and free to attend.

Date	Location	Event
Anytime	Webinar	What is FPGA
Anytime	Webinar	Intro to Acceleration Stack for Intel® Xeon® CPU with FPGA (OACCELINTRO)
April 10-13, 2018	Beijing, PRC	O'REILLY Artificial Intelligence Conference
April 10-11, 2018	Hyderabad, Indian	Intel India Developer Conference 2018
April 17-18, 2018	Espoo, Finland	Introduction to deep learning
April 22-25, 2018	Thuwal, Saudi Arabia	IXPUG KAUST Spring Conference 2018
April 23-24, 2018	Espoo, Finland	Introduction to CFD modelling with ANSYS
April 24-25, 2018	Umea, Sweden	Programming and Optimizing the Intel Knights Landing Manycore Processor
April 29-May 2, 2018	New York, New York	O'REILLY Artificial Intelligence Conference
May 4, 2018	Berkeley, US	Beyond OpenMP common core training
May 7, 2018	Roma, Italy	Introduction to Parallel Computing with MPI and OpenMP
May 10, 2018	Virtual	High Productivity Languages
May 14-15, 2018	Espoo, Finland	Introduction to Julia
May 23-24, 2018	San Francisco, California	Intel® AI Developer Conference (promo code: CMGPCC)
May 28-June 1, 2018	Ljubljana, Slovenia	European HPC Summit Week 2018
June 1, 2018	SIAM	James H. Wilkinson Prize for Numerical Software
June 21-22, 2018	LRZ, German	HPC code optimization workshop
June 26-July 4	Espoo, Finland	CSC Summer School in High-Performance Computing 2018
July 9, 2018	Roma, Italy	Summer School on Parallel Computing
August 19-23, 2018	Boston, MA	ACS Chemistry for life
September 4-7, 2018	San Francisco, California	O'REILLY Artificial Intelligence Conference
September 25-28, 2018	Hillsboro, OR	IXPUG Annual Fall Conference 2018
October 8-11, 2018	London, UK	O'REILLY Artificial Intelligence Conference
November, 2018	Milano, Italy	Introduction to Parallel Computing with MPI and OpenMP

More News...

Check out these latest news stories:

- [Making a Server as Easy to Upgrade as a Light Bulb](#)
- [Deep Learning at 15 PFlops Enables Training for Extreme Weather Identification at Scale](#)

- [Broad Institute and Intel Advance Genomics](#)
- [Making Genomic Healthcare available to everyone](#)
- [Intel FPGAS Accelerate artificial intelligence for deep learning in Microsoft's Bing intelligent search](#)
- [Cray to build FPGA-Accelerate supercomputer for Paderborn University](#)

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