ABSTRACTS

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BeeGFS®
developed by Fraunhofer

Fraunhofer
ITWM

FRAUNHOFER INSTITUTE FOR
INDUSTRIAL MATHEMATICS ITWM

HPC in rendering: Faster is never fast enough

Rendering is the engine that powers visualization, and visualization is the key to insights and amazing experiences. This talk introduces the audience to the link between HPC and the immense computational complexity that arises from transforming data to high-fidelity visual representations. Learn about Fraunhofer technologies for best-in-class performance and see how opportunities are created by fusing HPC with rendering.

Scalable Deep Learning

We introduce our scalable open source HPC Deep Learning Framework "CaffeGPI", our distributed hyperparameter optimization tool for deep learning "DLPS" and our latest research on distributed optimization methods for the training of deep neural networks.

TensorQuant – A TensorFlow Toolbox for Quantizing DNNs

Recent research implies that training and inference of deep neural networks (DNN) can be computed with low precision numerical representations of the training/test data, weights and gradients without a general loss in accuracy. TensorQuant allows a transparent quantization simulation of existing DNN topologies during training and inference within the popular deep learning framework TensorFlow. TensorQuant supports generic quantization methods and allows experimental evaluation of the impact of the quantization on single layers as well as on the full topology.

The BeeGFS Parallel Filesystem

The parallel cluster file system BeeGFS was designed with a strong focus on performance with easy installation and management in mind. A key aspect of its design has been to create a flexible, scalable PFS that makes it suitable for a huge range of operational scenarios.

Memory Driven Computing

Software defined memory is Fraunhofer's answer to the increasing complexity of the memory hierarchy. This talk presents the required components: The wire speed communication library GPI, the domain specific task execution engine ACE, and the general-purpose productivity framework GPI-Space.

Fraunhofer-Institut für Techno- und Wirtschaftsmathematik ITWM

Fraunhofer-Platz 1 | 67663 Kaiserslautern | Germany

Contact
Dr. Franz-Josef Pfreundt (Division Director "CC-HPC")
Phone +49 631 31600-4459 | pfreundt@itwm.fraunhofer.de

www.itwm.fraunhofer.de/en/hpc

2017_11_SC17-Fraunhofer talks

Fraunhofer talks about up-to-date research topics at booth 2143

TIMELINE

ABSTRACTS

Global
Address Space
Programming Interface
GASPI

TUESDAY, NOVEMBER 14

10:30 – 10:45 GASPI – The Global Address Space Programming Interface
Christian Simmendinger

11:15 – 11:30 GaspiLS – Scalability for CFD and FEM simulations
Daniel Grünewald

12:15 – 12:30 Memory Driven Computing
Mirko Rahn

1:00 – 1:15 TensorQuant – A TensorFlow Toolbox for Quantizing DNNs
Dominik Loroch

2:00 – 2:15 Scalable Deep Learning
Janis Keuper

2:30 – 2:45 HPC in rendering: Faster is never fast enough
Valentin Fütterling

From 3:00 pm to 6:00 pm: Join us for our booth party!

WEDNESDAY, NOVEMBER 15

10:30 – 10:45 Memory Driven Computing
Mirko Rahn

11:15 – 11:30 The BeeGFS Parallel File System
Christian Mohrbacher

12:15 – 12:30 HPC in rendering: Faster is never fast enough
Valentin Fütterling

1:00 – 1:15 TensorQuant – A TensorFlow Toolbox for Quantizing DNNs
Dominik Loroch

2:00 – 2:15 Scalable Deep Learning
Janis Keuper

3:00 – 3:15 GASPI – The Global Address Space Programming Interface
Christian Simmendinger

3:30 – 3:45 Gaspi based linear solver library
Daniel Grünewald

THURSDAY, NOVEMBER 16

10:15 – 10:45 TensorQuant – A TensorFlow Toolbox for Quantizing DNNs
Dominik Loroch

11:15 – 11:30 Memory Driven Computing
Mirko Rahn

12:15 – 12:30 GaspiLS – Scalability for CFD and FEM simulations
Daniel Grünewald

1:00 – 1:15 HPC in rendering: Faster is never fast enough
Valentin Fütterling

2:00 – 2:15 The BeeGFS Parallel File System
Christian Mohrbacher

GaspiLS – Scalability for CFD and FEM simulations
GaspiLS is a scalable sparse linear solver library incorporating the shift in programming paradigm, which is stimulated by the GASPI/GPI-2 API: Fully asynchronous data and task parallelism with complete overlap of communication and computation for optimal scalability. In this talk, we show how GaspiLS improves scalability and performance of existing CFD and FEM applications.

GaspiLS – The GPI-2/Gaspi based linear solver library
GaspiLS is a scalable sparse linear solver library incorporating the shift in programming paradigm, which is stimulated by the GASPI/GPI-2 API: Fully asynchronous data and task parallelism with complete overlap of communication and computation for optimal scalability. In this talk we give an overview on GaspiLS and its design principles.

GASPI – The Global Address Space Programming Interface
GASPI is a Partitioned Global Address Space (PGAS) API. It has shown extreme scalability, high flexibility and failure tolerance for parallel computing environments. GASPI aims to initiate a paradigm shift from bulk-synchronous two-sided communication patterns towards an asynchronous communication and execution model. To that end GASPI leverages remote completion and one-sided RDMA driven communication in a Partitioned Global Address Space.