48th International Conference on Parallel Processing

August 5(Mon)-8(Thu), 2019, Kyoto Research Park, Kyoto, Japan

Conference host

University of Tsukuba

University of Tsukuba Center for Computational Sciences

DDN STORAGE

Orchestrating a brighter world

NEC

AMD

intel

Mellanox TECHNOLOGIES

CRAY

arm

Fujitsu

MARVELL

Pacific Teck

SUPERMICRO

Smart Science

Intelligent Light

NVIDIA

ParaTools

Western Digital

This program is supported by a subsidy from Kyoto City and the Kyoto Convention & Visitors Bureau.
Monday, August 5th

08:30-09:00  Registration Open

Workshop day  09:00-17:30

09:00-12:30 and 14:00-17:30  Room-A
SRMPDS: International Workshop on Scheduling and Resource Management for Parallel and Distributed Systems

09:00-12:30  Room-B
AWASN: Applications of Wireless Ad hoc and Sensor Networks

14:00-17:30  Room-B
EMS: International Workshop on Embedded Multicore Systems

09:00-12:30  Room-C
PDML: Parallel and Distributed Machine Learning

14:00-17:30  Room-C
P2S2: International Workshop on Parallel Programming Models and Systems Software for High-End Computing

09:00-12:30 and 14:00-17:30  Room-G
EE HPC SOP: Energy Efficient HPC State of the Practice

12:30-14:00  Lunch
Please take lunch at the restaurant PATIO using a coupon.

18:00-19:30  Welcome Reception
Tuesday, August 6th

08:00-08:30  Registration Open  

08:30-09:00  Welcome and Introduction

09:00-10:00  Keynote-1
Chair: Kengo Nakajima
Depei Qian: Major issues in exascale computing in China

10:00-10:40  Best Paper for ICPP 2019
Chair: Kengo Nakajima, Martin Schulz
A Parallel Graph Algorithm for Detecting Mesh Singularities in Distributed Memory Ice Sheet Simulations
Ian A. Bogle (Rensselaer Polytechnic Institute), Karen Devine (Sandia National Laboratories), Mauro Perego (Sandia National Laboratories), Siva Rajamanickam (Sandia National Laboratories), George M. Slota (Rensselaer Polytechnic Institute)

10:40-11:10  Coffee Break

11:10-12:50  Session T1A
Chair: Yuetsu Kodama
Memory Architectures

MAC: Memory Access Coalescer for 3D-Stacked Memory
Xi Wang (Texas Tech University), Antonino Tumeo (Pacific Northwest National Laboratory), John D. Leidel (Tactical Computing Labs, Texas Tech University), Jie Li (Texas Tech University), Yong Chen (Texas Tech University)

Machine Learning for Fine-Grained Hardware Prefetcher Control
Jason Hiebel (Michigan Technological University), Laura E. Brown (Michigan Technological University), Zhenlin Wang (Michigan Technological University)

AVR: Reducing Memory Traffic with Approximate Value Reconstruction
Albin Eldstal-Damlin (Chalmers University of Technology), Pedro Moura Trancoso (Chalmers University of Technology), Ioannis Sourdis (Chalmers University of Technology)

Near-Data Processing-Enabled and Time-Aware Compaction Optimization for LSM-tree-based Key-Value Stores
Hui Sun (Anhui University), Wei Liu (Anhui University), Jianzhong Huang (Huazhong University of Science and Technology), Song Fu (University of North Texas), Zhi Qiao (University of North Texas), Weisong Shi (Wayne State University)

11:10-12:50  Session T1B
Chair: Daisuke Takahashi
Workflow and Data Analysis Systems

Incorporating Probabilistic Optimizations for Resource Provisioning of Data Processing Workflows
Amelie Chi Zhou (Shenzhen University), Yao Xiao (Shenzhen University), Bingsheng He (National University of Singapore), Shadi Ibrahim (Inria), Reynold Cheng (University of Hong Kong)

ECoST: Energy-Efficient Co-Locating and Self-Tuning MapReduce Applications
maria malik (George Mason University, Intel), Hassan Ghasemzadeh (Washington State University), Tinoosh Mohsenin (University of Maryland, Baltimore County), Rosario Cammarota (Intel), Liang Zhao (George Mason University), Avesta Sasan (George Mason University), Houman Homayoun (George Mason University), Setareh Rafatirad (George Mason University)
Tuesday, August 6th

**Stage Delay Scheduling: Speeding up DAG-style Data Analytics Jobs with Resource Interleaving**
Wujie Shao (East China Normal University), Fei Xu (East China Normal University), Li Chen (University of Louisiana at Lafayette), Haoyue Zheng (East China Normal University), Fangming Liu (Huazhong University of Science and Technology)

**Solving All-Pairs Shortest-Paths Problem in Large Graphs Using Apache Spark**
Frank Schoeneman (University at Buffalo), Jaroslaw Zola (University at Buffalo)

11:10-12:50 **Session T1C**
**Room-2**

**Data Centers**

**Unleashing the Scalability Potential of Power-Constrained Data Center in the Microservice Era**
Xiaofeng Hou (Shanghai Jiao Tong University), Jiacheng Liu (Shanghai Jiao Tong University), Chao Li (Shanghai Jiao Tong University), Minyi Guo (Shanghai Jiao Tong University)

**Dynamic Load Balancing in Hybrid Switching Data Center Networks with Converters**
Jiaqi Zheng (Nanjing University), Qiming Zheng (Shanghai Jiao Tong University), Xiaofeng Gao (Shanghai Jiao Tong University), Guihai Chen (Nanjing University)

**Nested Virtualization Without the Nest**
Mathieu Bacou (IRIT, Universite de Toulouse, CNRS, Toulouse), Gregoire Todeschi (IRIT, Universite de Toulouse, CNRS, Toulouse), Alain Tchana (I3S, Universite Sophia Antipolis, CNRS, Nice), Daniel Hagimont (IRIT, Universite de Toulouse, CNRS, Toulouse)

**When Power Oversubscription Meets Traffic Flood Attack: Re-Thinking Data Center Peak Load Management**
Xiaofeng Hou (Shanghai Jiao Tong University), Mingyu Lliang (Shanghai Jiao Tong University), Chao Li (Shanghai Jiao Tong University), Wenli Zheng (Shanghai Jiao Tong University), Quan Chen (Shanghai Jiao Tong University), Minyi Guo (Shanghai Jiao Tong University)

12:50-14:10 **Lunch**

Please take a lunch box at the registration desk and have lunch at Banquet Hall or the conference rooms.

14:10-15:50 **Session T2A**
**Buzz Hall**

**Memory Optimizations**

**LFOC: A Lightweight Fairness-Oriented Cache Clustering Policy for Commodity Multicores**
Adrian Garcia-Garcia (UCM), Juan Carlos Saez (UCM), Fernando Castro (UCM), Manuel Prieto-Matias (UCM)

**DICER: Diligent Cache Partitioning for Efficient Workload Consolidation**
Konstantinos Nikas (National Technical University of Athens), Nikela Papadopoulou (National Technical University of Athens), Dimitra Giantsidi (National Technical University of Athens), Vasileios Karakostas (National Technical University of Athens), Georgios Goumas (National Technical University of Athens), Nectarios Koziris (National Technical University of Athens)

**EMBA: Efficient Memory Bandwidth Allocation to Improve Performance on Intel Commodity Processor**
Yaoceng Xiang (Peking University), Chencheng Ye (Huazhong University of Science and Technology), Xiaolin Wang (Peking University), Yingwei Luo (Peking University), Zhenlin Wang (Michigan Technological University)

**CP-pf: a prefetch aware LLC partitioning approach**
Jun Xiao (University of Amsterdam), Andy Pimentel (University of Amsterdam), Xu Liu (College of William and Mary)
### Session T2B
**Chair:** Guillaume Pallez

**Parallel Systems Algorithms**

**TLB: Traffic-aware Load Balancing with Adaptive Granularity in Data Center Networks**  *Best Paper Candidate*
- Jinbin Hu (Central South University), Jiawei Huang (Central South University), Wenjun Lv (Central South University), Weihe Li (Central South University), Jianxin Wang (Central South University), Tian He (University of Minnesota)

- Carlos Fernandez Musoles (The University of Sheffield), Daniel Coca (The University of Sheffield), Paul Richmond (The University of Sheffield)

**A Network-aware and Partition-based Resource Management Scheme for Data Stream Processing**
- Yidan Wang (RMIT University), Zahir Tari (RMIT University), Xiaoran Huang (The University of Melbourne), Y. Zomaya Albert (The University of Sydney)

**PhSIH: A Lightweight Parallelization of Event Matching in Content-based Pub/Sub Systems**
- Zhengyu Liao (Shanghai Jiao Tong University), Shiyou Qian (Shanghai Jiao Tong University), Jian Cao (Shanghai Jiao Tong University), Yanyue Cao (Shanghai Jiao Tong University), Guangtao Xue (Shanghai Jiao Tong University), Jia Di Yu (Shanghai Jiao Tong University), Yanmin Zhu (Shanghai Jiao Tong University), Mingli Li (Shanghai Jiao Tong University)

### Session T2C
**Chair:** Eishi Arima

**NVRAM and SSD**

**A Read-leveling Data Distribution Scheme for Promoting Read Performance in SSDs with Deduplication**
- Mengting Lu (Huazhong University of Science and Technology), Fang Wang (Wuhan National Laboratory for Optoelectronics, School of Computer Science and Technology, Huazhong University of Science and Technology), Zhipeng Tan (Huazhong University of Science and Technology, School of Computer Science and Technology), Dan Feng (Wuhan National Laboratory for Optoelectronics, School of Computer Science and Technology, Huazhong University of Science and Technology), Yuchong Hu (Wuhan National Laboratory for Optoelectronics, School of Computer Science and Technology)

**RFPL: A Recovery Friendly Parity Logging Scheme for Reducing Small Write Penalty of SSD RAID**
- Gaoxiang Xu (Wuhan National Laboratory for Optoelectronics, School of Computer Science, Huazhong University of Science and Technology), dan Feng (Huazhong University of Science and Technology), Xinyan Zhang (Huahong University of Science and Technology), Yifeng Zhu (University of Maine), Xi Shu (Huazhong University of Science and Technology)

**TEA: A Traffic-efficient Erasure-coded Archival Scheme for In-memory Stores**
- Bin Xu (Huazhong University of Science and Technology), Jianzhong Huang (Huazhong University of Science and Technology), Qiang Cao (Huazhong University of Science and Technology), Xiao Qin (Auburn University)

**CostPI: Cost-Effective Performance Isolation for Shared NVMe SSDs**
- Jiahao Liu (Huazhong University of Science and Technology), Fang Wang (Huazhong University of Science and Technology), Dan Feng (Huazhong University of Science and Technology)
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Venue</th>
<th>Chair</th>
</tr>
</thead>
<tbody>
<tr>
<td>16:20-18:00</td>
<td><strong>Session T3A</strong></td>
<td>Buzz Hall</td>
<td>Toshio Endo</td>
</tr>
<tr>
<td></td>
<td><strong>Parallel Architectures</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>SaC: Exploiting Execution-Time Slack to Save Energy in Heterogeneous Multicore Systems</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Muhammad Waqar Azhar (Chalmers University of Technology), Miquel Pericas (Chalmers University of Technology), Per Stenstrom (Chalmers University of Technology)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Express Link Placement for NoC-Based Many-Core Platforms</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yunfan Li (Oregon State University), Di Zhu (University of Southern California), Lizhong Chen (Oregon State University)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Modeling the Performance of Atomic Primitives on Modern Architectures</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fazeleh Hoseini (Chalmers University of Technology), Aras Atalar (Chalmers University of Technology), Philippas Tsigas (Chalmers University of Technology)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>The Case for Water-Immersion Computer Boards</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Michihiro Koibuchi (National Institute of Informatics, The Graduate University of Advanced Studies), Ikki Fujiwara (National Institute of Informatics), Naoya Niwa (Keio University), Tomohiro Totoki (Keio University), Shoichi Hirasawa (National Institute of Informatics)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16:20-18:00</td>
<td><strong>Session T3B</strong></td>
<td>Room-1</td>
<td>Masahiro Nakao</td>
</tr>
<tr>
<td></td>
<td><strong>Scheduling</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>JobPacker: Job Scheduling for Data-Parallel Frameworks with Hybrid Electrical/Optical Datacenter Networks</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Zhuozhao Li (University of Chicago), Haiying Shen (University of Virginia)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Holistic Slowdown Driven Scheduling and Resource Management for Malleable Jobs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Marco D’Amico (Barcelona Supercomputing Center (BSC)), Ana Jokanovic (Barcelona Supercomputing Center (BSC)), Julita Corbalan (Universitat Politecnica de Catalunya)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Speculative Scheduling for Stochastic HPC Applications</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ana Gainaru (Vanderbilt), Guillaume Pallez (Inria), Hongyang Sun (Vanderbilt), Padma Raghavan (Vanderbilt)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Cooperative Job Scheduling and Data Allocation for Busy Data-Intensive Parallel Computing Clusters</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Guoxin Liu (Clemson University), Haiying Shen (University of Virginia), Haoyu Wang (University of Virginia)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16:20-18:00</td>
<td><strong>Session T3C</strong></td>
<td>Room-2</td>
<td>Hiroya Matsuba</td>
</tr>
<tr>
<td></td>
<td><strong>I/O Systems</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>N-Code: An Optimal RAID-6 MDS Array Code for Load Balancing and High I/O Performance</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ping Xie (The Computer College of Qinghai Normal University), Zhu Yuan (The Computer College of Qinghai Normal University), JianZhong Huang (Huazhong University of Science &amp; Technology), Xiao Qin (Auburn University)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>BPP: A Realtime Block Access Pattern Mining Scheme for I/O Prediction</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chunjie Zhu (Wuhan National Lab for Optoelectronics, Huazhong University of Science and Technology, Wuhan), Fang Wang (Wuhan National Lab for Optoelectronics, Huazhong University of Science and Technology, Wuhan), Binbing Hou (Department of Computer Science)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>DeepHash: An End-to-End Learning Approach for Metadata Management in Distributed File Systems</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yuanning Gao (Shanghai Jiao Tong University), Xiaofeng Gao (Shanghai Jiao Tong University), Guihai Chen (Shanghai Jiao Tong University)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
AdaM: An Adaptive Fine-Grained Scheme for Distributed Metadata Management
Shiyi Cao (Shanghai Jiao Tong University), Yuanning Gao (Shanghai Jiao Tong University), Xiaofeng Gao (Shanghai Jiao Tong University), Guihai Chen (Shanghai Jiao Tong University)

18:10-20:00 Poster Reception
Banquet Hall

Poster 1
Performance improvement of MODYLAS using Remote Direct Memory Access on the K computer
Masahiro Nakao (RIKEN R-CSS), Hitoshi Murai (RIKEN R-CSS), Mitsuhashi Sato (RIKEN R-CSS) Yoshimichi Andoh (Nagoya University), Susumu Okazaki (Nagoya University)

Poster 2
Performance evaluation of kinetic code on scalar processors
Takayuki Umeda (Nagoya University)

Poster 3
Can Local Binary Convolutions Make Neural Networks Models Smaller?
Haoyu Zhang (Tokyo Institute of Technology), Mohamed Wahib (AIST), Peng Chen (Tokyo Institute of Technology, AIST), Satoshi Matsuoka (Tokyo Institute of Technology, RIKEN R-CSS)

Poster 4
Data centers are a software development challenge
Luca Bertol (ENI), Walter Nardelli(ENI), Peter Sato(EE HPC WG)

Poster 5
Efficient VNF Migration and Recovery in Edge Computing Environments
Yu Chen (Nanjing University), Sheng Zhang (Nanjing University), Yanchao Zhao (Nanjing University of Aeronautics and Astronautics), Zhuchong Qian (Nanjing University), Yu Liang (Nanjing University), Jidong Ge (Nanjing University), Sanglu Lu (Nanjing University)

Poster 6
A Case for Co-scheduling for Hybrid Memory Based Systems
Eishi Arima (The University of Tokyo), Carsten Trinitis (Technical University of Munich)

Poster 7
Improving Strong Scalability Limits of Finite Element Based Solvers
Niclas Jansson (KTH Royal Institute of Technology)

Poster 8
AutoEncoder based Active Signal Map Crowdsourcing
Chengyong Liu (Nanjing University of Aeronautics and Astronautics), Yanchao Zhao (Nanjing University of Aeronautics and Astronautics), Kun Zhu (Nanjing University of Aeronautics and Astronautics), Sheng Zhang (Nanjing University), Jie Wu (Temple University)

Poster 9
A Relaxed Balanced Non-Blocking Binary Search Tree
Manish Singh (Wellington Institute of Technology), Lindsay Groves (Victoria University of Wellington), Alex Potanin (Victoria University of Wellington)

Poster 10
Implementation of Partitioning of Hierarchical Matrices using Task Parallel Languages
Zhengyang Bai (Kyoto University), Tasuku Hiraishi (Kyoto University), Akihiro Ida (The University of Tokyo), Masahiro Yasugi (Kyushu Institute of Technology)

Poster 11
Toward Training a Large 3D Cosmological CNN with Hybrid Parallelization
Yosuke Oyama(tokyo Institute of Technology, Lawrence Livermore National Laboratory), Naoya Maruyama (Lawrence Livermore National Laboratory), Nikolai Dryden (University of Illinois at Urbana-Champaign, Lawrence Livermore National Laboratory), Peter Harrington (Lawrence Berkeley National Laboratory), Jan Balewski (Lawrence Berkeley National Laboratory), Satoshi Matsuoaka(RIKEN R-CCS, Tokyo Institute of Technology), Marc Snir (University of Illinois at Urbana-Champaign), Peter Nugent (Lawrence Berkeley National Laboratory), and Brian Van Essen (Lawrence Livermore National Laboratory)

Poster 12
Maintaining Connectivity in Parallel Graph Partitioning
Christopher I. Jones (Rensselaer Polytechnic Institute Troy), Ian Bogle (Rensselaer Polytechnic Institute Troy), George M. Slota (Rensselaer Polytechnic Institute Troy)

Poster 13
Simple DSL for Power-Performance Modeling with Segmented Linear Models
Yuan He (Shenyang University of Technology), Yasufaka Wada (Meisei University), Guanqin Pan (Shenyang University of Technology), Masaaki Kondo (The University of Tokyo, RIKEN)

Poster 14
Enabling Data Processing under Erasure Coding in the Fog
Jad Darrous (Univ. Lyon, Inria. CNRS, ENS de Lyon), Shadi Ibrahim (Inria, IMT Atlantique, L2SN)

Poster 15
Single Precision Calculation of Iterative Refinement of Pairs of a Real Symmetric-Definite Generalized Eigenproblem by Using a Filter Composed of a Single Resolvent
Hiroshi Murakami (Tokyo Metropolitan University)

Poster 16
Performance Improvement of Deep Learning Training on Large-scale Manycore Cluster
Toshhiro Hanawa (The University of Tokyo), Kohei Tamura (The University of Tokyo)

Poster 17
Understanding the Overheads of Launching CUDA Kernels
Lingqi Zhang (Tokyo Institute of Technology), Mohamed Wahib (AIST), Satoshi Matsuoka (RIKEN R-CSS, Tokyo Institute of Technology)

Poster 18
An Operations Monitoring and Notification Infrastructure (OMNI) for Exascale Data Center Operations
Melissa Romanus (Rutgers University, Lawrence Berkeley National Laboratory), Elizabeth Bautista (Lawrence Berkeley National Laboratory), Thomas Davis (Lawrence Berkeley National Laboratory), Cary Whitney (Lawrence Berkeley National Laboratory)
Wednesday, August 7th

09:00-09:30  Registration Open

09:30-10:30  Keynote-2  Chair: Taisuke Boku
Satoshi Sekiguchi: Transforming SMEs and Manufacturing industry business into AI ready empowered by the ABCI

10:30-11:00  Coffee Break

11:00-12:40  Session T4A  Chair: Atsushi Hori
On Node Optimization

Optimized Execution of Parallel Loops via User-Defined Scheduling Policies
Seonmyeong Bak (Georgia Institute of Technology), Yanfei Guo (Argonne National Laboratory), Pavan Balaji (Argonne National Laboratory), Vivek Sarkar (Georgia Institute of Technology)

Data and Thread Placement in NUMA Architectures: A Statistical Learning Approach
Nicolas Denoyelle (Argonne National Laboratory), Brice Goglin (Inria), Emmanuel Jeannot (Inria), Thomas Ropars (LIG)

HPAS: An HPC Performance Anomaly Suite for Reproducing Performance Variations
Emre Ates (Boston University), Yijia Zhang (Boston University), Burak Aksar (Boston University), Jim Brandt (Sandia National Laboratories), Vitus J. Leung (Sandia National Laboratories), Manuel Egele (Boston University), Ayse K. Coskun (Boston University)

Reducing Kernel Surface Areas for Isolation and Scalability
Daniel Zahka (Washington University in St. Louis), Brian Kocoloski (Washington University in St. Louis), Kate Keahey (Argonne National Laboratory)

11:00-12:40  Session T4B  Chair: Osni Marques
Parallel Algorithms 1

Accelerating All-Edge Common Neighbor Counting on Three Processors
Yulin Che (Hong Kong University of Science and Technology), Zhuohang Lai (Hong Kong University of Science and Technology), Shixuan Sun (Hong Kong University of Science and Technology), Qiong Luo (Hong Kong University of Science and Technology), Yue Wang (Hong Kong University of Science and Technology)

Tessellating Star Stencils
Liang Yuan (ICT, CAS), Shan Huang (ICT, CAS), Yunquan Zhang (ICT, CAS), Hang Cao (ICT, CAS)

Parallel Algorithms for Evaluating Matrix Polynomials
Sivan Toledo (Tel-Aviv University), Amit Waisel (Tel-Aviv University)

A 2D Parallel Triangle Counting Algorithm for Distributed-Memory Architectures
Ancy Sarah Tom (University of Minnesota), George Karypis (University of Minnesota)

11:00-12:40  Session T4C  Chair: Satoshi Imamura
Communication Architectures

Network Congestion-aware Online Service Function Chain Placement and Load Balancing
Xiaojun Shang (Stony Brook University), Zhenhua Liu (Stony Brook University), Yuanyuan Yang (Stony Brook University)
Wednesday, August 7th

**Breaking Band: A Breakdown of High-performance Communication**
Rohit Zambre (University of California, Irvine), Megan Grodowitz (Arm Research), Aparna Chandramowlishwaran (University of California, Irvine), Pavel Shamis (Arm Research)

**Cartesian Collective Communication**
Jesper Larsson Traff (TU Wien (Vienna University of Technology)), Sascha Hunold (TU Wien (Vienna University of Technology))

**Design Exploration of Multi-tier Interconnection Networks for Exascale Systems**
Javier Navaridas (University of Manchester), Josh Lant (University of Manchester), Jose A. Pascual (University of the Basque country), Mikel Lujan (University of Manchester), John Goodacre (University of Manchester)

12:40-14:00 **Lunch**
Please take a lunch box at the registration desk and have lunch at Banquet Hall or the conference rooms.

14:00-15:40 **Session T5A**
**Chair: Miquel Pericas**
System Software for GPUs

**Adaptive Routing Reconfigurations to Minimize Flow Cost in SDN-Based Data Center Networks**
Akbar Majidi (Shanghai Jiaotong University), Xiaofeng Gao (Shanghai Jiao Tong University Shanghai), Shunjia Zhu (Brown University), Nazila Jahanbakhsh (Shanghai Jiao Tong University Shanghai), Guihai Chen (Shanghai Jiao Tong University Shanghai)

**A Specialized Concurrent Queue for Scheduling Irregular Workloads on GPUs**
David Troendle (University of Mississippi, Department of Information and Computer Science), Tuan Ta (Cornell University, School of Electrical and Computer Engineering), Byunghyun Jang (University of Mississippi, Department of Information and Computer Science)

**Predictable GPUs Frequency Scaling for Energy and Performance**
Kaijie Fan (Technical University Berlin), Biagio Cosenza (Technical University Berlin), Ben Juurlink (Technical University Berlin)

**Compiler-Assisted GPU Thread Throttling for Reduced Cache Contention**
Hyunjun Kim (Sungkyunkwan University), Sungin Hong (Sungkyunkwan University), Hyeonsu Lee (Sungkyunkwan University), Euiseong Seo (Sungkyunkwan University), Hwansoo Han (Sungkyunkwan University)

14:00-15:40 **Session T5B**
**Chair: Jakub Kurzak**
Parallel Algorithms 2

**SAFE: Service Availability via Failure Elimination Through VNF Scaling**
Rui Xia (Nanjing University), Haipeng Dai (Nanjing University), Jiaqi Zheng (Nanjing University), Rong Gu (Nanjing University), Xiaoyu Wang (Nanjing University), Guihai Chen (Nanjing University)

**On Max-min Fair Resource Allocation for Distributed Job Execution**
Yitong Guan (Nanyang Technological University), Chuanyou Li (Southeast University), Xueyan Tang (Nanyang Technological University)

**Improving Short Job Latency Performance in Hybrid Job Schedulers with Dice**
Wei Zhou (University of Virginia), K. Preston White (University of Virginia), Hongfeng Yu (University of Nebraska-Lincoln)

**A Practical, Scalable, Relaxed Priority Queue**
Tingzhe Zhou (Lehigh University), Maged Michael (Facebook), Michael Spear (Lehigh University)
Wednesday, August 7th

14:00-15:40  
Room-2  
Session T5C  
Networking  
Chair: Toshihiro Hanawa

Network Congestion Avoidance through Packet-chaining Reservation
Ke Wu (NUDT), Dezun Dong (NUDT), Cunlu Li (NUDT), Shan Huang (NUDT), Yi Dai (NUDT)

A Tale of Two (Flow) Tables: Demystifying Rule Caching in OpenFlow Switches
Rui Li (School of Computer Science, Fudan university), Yu Pang (School of Computer Science, Fudan university), Jin Zhao (School of Computer Science, Fudan university), Xin Wang (Shanghai Key Laboratory of Intelligent Information Processing, Fudan university)

Artemis: A Practical Low-latency Naming and Routing System
Xuebing Li (Fudan University), Bingyang Liu (Huawei), Yang Chen (Fudan University), Yu Xiao (Aalto University), Jiaxin Tang (Fudan University), Xin Wang (Fudan University)

Fast Recovery Techniques for Erasure-coded Clusters in Non-uniform Traffic Network
Yunren Bai (Department of Computer Science and Technology Beijing National Research Center for Information Science and Technology, Tsinghua University), Zihan Xu (Department of Computer Science and Technology Beijing National Research Center for Information Science and Technology, Tsinghua University), Haixia Wang (Beijing National Research Center for Information Science and Technology, Tsinghua University), Dongsheng Wang (Department of Computer Science and Technology Beijing National Research Center for Information Science and Technology, Tsinghua University)

15:40-16:10  
Banquet Hall  
2F Foyer  
Coffee Break

16:10-17:50  
Buzz Hall  
Session T6A  
Accelerator Applications  
Chair: Franz Franchetti

Gravitational Octree Code Performance Evaluation on Volta GPU
Yohei Miki (The University of Tokyo)

Gossip: Efficient Communication Primitives for Multi-GPU Systems
Robin Kobus (Johannes Gutenberg University Mainz), Daniel Junger (Johannes Gutenberg University Mainz), Christian Hundt (NVIDIA AI Technology Center), Bertil Schmidt (Johannes Gutenberg University Mainz)

Controlled Asynchronous GVT: Accelerating Parallel Discrete Event Simulation on Many-Core Clusters
Ali Eker (Binghamton University), Barry Williams (Binghamton University), Kenneth Chiu (Binghamton University), Dmitry Ponomarev (Binghamton University)

Distributed Join Algorithms on Multi-GPU Clusters with GPUTDirect RDMA
Chengxin Guo (Renmin University of China), Hong Chen (Renmin University of China), Feng Zhang (Renmin University of China), Cuiping Li (Renmin University of China)

16:10-17:50  
Room-1  
Session T6B  
Fault Tolerance  
Chair: Allen Malony

Transfer Learning based Failure Prediction for Minority Disks in Large Data Centers of Heterogeneous Disk Systems
Ji Zhang (Huazhong university of science and technology), Ke Zhou (Huazhong university of science and technology), Ping Huang (Temple university), Xubin He (Temple university), Zhili Xiao (Tencent Inc.), Bin Cheng (Tencent Inc.), Yongguang Ji (Tencent Inc.), Yinhu Wang (Tencent Inc.)
Wednesday, August 7th

**How to Make the Preconditioned Conjugate Gradient Method Resilient Against Multiple Node Failures**
Carlos Pachajoa (University of Vienna), Markus Levonyak (University of Vienna), Wilfried N. Gansterer (University of Vienna), Jesper Larsson Traff (TU Wien)

**COMBFT: Conflicting-Order-Match based Byzantine Fault Tolerance Protocol with High Efficiency and Robustness**
Yingyao Rong (Sun Yat-sen University), Weigang Wu (Sun Yat-sen University), Zhiguang Chen (Sun Yat-sen University)

**Lightweight Fault Tolerance in Pregel-Like Systems**
Da Yan (The University of Alabama at Birmingham), James Cheng (CUHK), Hongzhi Chen (CUHK), Cheng Long (Nanyang Technological University), Purushotham Bangalore (The University of Alabama at Birmingham)

16:10-17:50
**Session T6C**
Chair: Kengo Nakajima
Applications 1 - Simulations

**diBELLA: Distributed Long Read to Long Read Alignment**
Marquita Ellis (University of California at Berkeley, Lawrence Berkeley National Lab), Giulia Guidi (University of California at Berkeley, Lawrence Berkeley National Lab), Aydin Buluc (Lawrence Berkeley National Lab), Leonid Oliker (Lawrence Berkeley National Lab), Katherine Yelick (University of California at Berkeley, Lawrence Berkeley National Lab)

**Accelerating Long Read Alignment on Three Processors**
Zonghao Feng (Hong Kong University of Science and Technology), Shuang Qiu (Hong Kong University of Science and Technology), Lipeng Wang (Hong Kong University of Science and Technology), Qiong Luo (Hong Kong University of Science and Technology)

**Refactoring and Optimizing WRF Model on Sunway TaihuLight**
Kai Xu (Shandong University, National Supercomputing Center in Wuxi), Zhenya Song (Laboratory for Regional Oceanography and Numerical Modeling, QNLM First Institute of Oceanography, MNR), Yuandong Chan (Shandong University), Shida Wang (Shandong University, National Supercomputing Center in Wuxi), Xiangxu Meng (Engineering Research Center of Digital Media Technology, Ministry of Education, Shandong University), Weiguo Liu (Shandong University, National Supercomputing Center in Wuxi), Wei Xue (Tsinghua University, National Supercomputing Center in Wuxi)

**Improved Unconstrained Energy Functional Method for Eigensolvers in Electronic Structure Calculations *Best Paper Candidate**
Mauro Del Ben (Lawrence Berkeley National Laboratory), Osni Marques (Lawrence Berkeley National Laboratory), Andrew Canning (Lawrence Berkeley National Laboratory)

18:20-20:20
**Banquet**
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:00-09:30</td>
<td><strong>Registration Open</strong></td>
</tr>
<tr>
<td>09:30-10:30</td>
<td><strong>Keynote-3</strong></td>
</tr>
<tr>
<td></td>
<td><em>Chair: Martin Schulz</em></td>
</tr>
<tr>
<td></td>
<td>Richard Vuduc: Performance engineering for sparse matrix, tensor, and graph computations</td>
</tr>
<tr>
<td>10:30-11:00</td>
<td><strong>Coffee Break</strong></td>
</tr>
<tr>
<td>11:00-12:40</td>
<td><strong>Session T7A</strong></td>
</tr>
<tr>
<td></td>
<td><em>Chair: Balazs Gerofi</em></td>
</tr>
<tr>
<td></td>
<td>Programming Systems and Runtimes</td>
</tr>
<tr>
<td></td>
<td><strong>Efficient Data-Parallel Primitives on Heterogeneous Systems</strong></td>
</tr>
<tr>
<td></td>
<td>Zhuohang LAI (Hong Kong University of Science and Technology), Qiong LUO (Hong Kong University of Science and Technology), Xiaolong XIE (Alibaba Inc.)</td>
</tr>
<tr>
<td></td>
<td><strong>Accelerated Work Stealing</strong></td>
</tr>
<tr>
<td></td>
<td>D. Brian Larkins (Rhodes College), John Snyder (Duke University), James Dinan (Intel Corporation)</td>
</tr>
<tr>
<td></td>
<td><strong>Runtime Adaptive Task Inlining on Asynchronous Multitasking Runtime Systems</strong></td>
</tr>
<tr>
<td></td>
<td>Bibek Wagle (Louisiana State University), Mohammad Alaul Haque Monil (University Of Oregon), Kevin Huck (University Of Oregon), Allen D. Malony (University Of Oregon), Adrian Serio (Louisiana State University), Hartmut Kaiser (Louisiana State University)</td>
</tr>
<tr>
<td></td>
<td><strong>HOPE: A Parallel Execution Model Based on Hierarchical Omission</strong></td>
</tr>
<tr>
<td></td>
<td>Masahiro Yasugi (Kyushu Institute of Technology), Daisuke Muraoka (Kyushu Institute of Technology), Tasuku Hiraishi (Kyoto University), Seiji Umatani (Kanagawa University), Kento Emoto (Kyushu Institute of Technology)</td>
</tr>
<tr>
<td>11:00-12:40</td>
<td><strong>Session T7B</strong></td>
</tr>
<tr>
<td></td>
<td><em>Chair: Toshio Endo</em></td>
</tr>
<tr>
<td></td>
<td>Performance Modeling</td>
</tr>
<tr>
<td></td>
<td><strong>Performance, Energy, and Scalability Analysis and Improvement of Parallel Cancer Deep Learning CANDLE Benchmarks</strong></td>
</tr>
<tr>
<td></td>
<td>Xingfu Wu (Argonne National Laboratory, University of Chicago), Valerie Taylor (Argonne National Laboratory, University of Chicago), Justin M. Wozniak (Argonne National Laboratory, University of Chicago), Rick Stevens (Argonne National Laboratory, University of Chicago), Thomas Brettin (Argonne National Laboratory), Fangfang Xia (Argonne National Laboratory)</td>
</tr>
<tr>
<td></td>
<td><strong>Adaptive Learning for Concept Drift in Application Performance Modeling</strong></td>
</tr>
<tr>
<td></td>
<td>Sandeep Madireddy (Argonne National Laboratory), Prasanna Balaprabaksh (Argonne National Laboratory), Philip Carns (Argonne National Laboratory), Robert Latham (Argonne National Laboratory), Glenn K. Lockwood (Lawrence Berkeley National Laboratory), Robert Ross (Argonne National Laboratory), Shane Snyder (Argonne National Laboratory), Stefan M. Wild (Argonne National Laboratory)</td>
</tr>
<tr>
<td></td>
<td><strong>I/O Characterization and Performance Evaluation of BeeGFS for Deep Learning</strong></td>
</tr>
<tr>
<td></td>
<td>Fahim Tahmid Chowdhury (Florida State University), Yue Zhu (Florida State University), Todd Heer (Lawrence Livermore National Laboratory), Saul Paredes (Florida State University), Adam Moody (Lawrence Livermore National Laboratory), Robin Goldstone (Lawrence Livermore National Laboratory), Kathryn Mohror (Lawrence Livermore National Laboratory), Weikuan Yu (Florida State University)</td>
</tr>
</tbody>
</table>
Thursday, August 8th

Performance Models for Data Transfers: A Case Study with Molecular Chemistry Kernels
Suraj Kumar (Pacific Northwest National Laboratory), Lionel Eyraud-Dubois (Inria Bordeaux Sud-Ouest), Sriram Krishnamoorthy (Pacific Northwest National Laboratory)

11:00-12:40 Session T7C
Simulation Techniques

OSP: Overlapping Computation and Communication in Parameter Server for Fast Machine Learning
Haozhao Wang (Huazhong University of Science and Technology, PolyU: The Hong Kong Polytechnic University), Song Guo (The Hong Kong Polytechnic University), Ruixuan Li (Huazhong University of Science and Technology)

Automatic Differentiation for Adjoint Stencil Loops *Best Paper Candidate
Jan Huckelheim (Imperial College London), Navjot Kukreja (Imperial College London), Sri Hari Krishna Narayanan (Argonne National Laboratory), Fabio Luporini (Imperial College London), Gerard Gorman (Imperial College London), Paul Hovland (Argonne National Laboratory)

Spatially-aware Parallel I/O for Particle Data
Sidharth Kumar (University of Alabama at Birmingham), Steve Petruzza (University of Utah), Will Usher (University of Utah), Valerio Pascucci (University of Utah)

The Communication-Overlapped Hybrid Decomposition Parallel Algorithm for Multi-Scale Fluid Simulations
Yi Liu (National University of Defense Technology), Xiao-Wei Guo (National University of Defense Technology), Chao Li (National University of Defense Technology), Canjun Yang (National University of Defense Technology), Xinbiao Gan (National University of Defense Technology), Peng Zhang (National University of Defense Technology), Yi Wang (National University of Defense Technology), Ran Zhao (National University of Defense Technology), Sijiang Fan (National University of Defense Technology)

12:40-14:00 Lunch
Please take a lunch box at the registration desk and have lunch at Banquet Hall or the conference rooms.

14:00-15:40 Session T8A
Deep Learning

Cynthia: Cost-Efficient Cloud Resource Provisioning for Predictable Distributed Deep Neural Network Training
Haoyue Zheng (East China Normal University), Fei Xu (East China Normal University), Li Chen (University of Louisiana at Lafayette), Zhi Zhou (Sun Yat-sen University), Fangming Liu (Huazhong University of Science and Technology)

FlowCon: Elastic Flow Configuration for Containerized Deep Learning Applications
Wenjia Zheng (Fordham University), Michael Tynes (Fordham University), Henry Gorelick (Fordham University), Ying Mao (Fordham University), Long Cheng (University College Dublin), Yantian Hou (Boise State University)

DLBooster: Boosting End-to-End Deep Learning Workflows with Offloading Data Preprocessing Pipelines
Yang Cheng (Tsinghua University, Microsoft Research), Dan Li (Tsinghua University), Zhiyuan Guo (Microsoft Research, Beihang University), Binyao Jiang (Microsoft Research, Shanghai Jiao Tong University), Jiaxin Lin (Microsoft Research, Beihang University), Xi Fan (Microsoft Research, Shanghai Jiao Tong University), Jinkun Geng (Tsinghua University), Xinyi Yu (Microsoft Research, Shanghai Jiao Tong University), Wei Bai (Microsoft Research), Lei Qu (Microsoft Research), Ran Shu (Microsoft Research), Peng Cheng (Microsoft Research), Yongqiang Xiong (Microsoft Research), Jianping Wu (Tsinghua University)
Thursday, August 8th

**Session T8B**

**A Plugin Architecture for the TAU Performance System**  
Allen D. Malony (University of Oregon), Srinivasan Ramesh (University of Oregon), Kevin Huck (University of Oregon), Nicholas Chaimov (ParaTools, Inc.), Sameer Shende (University of Oregon)

**FuncyTuner: Auto-tuning Scientific Applications With Per-loop Compilation *Best Paper Candidate**  
Tao Wang (North Carolina State University), Nikhil Jain (Lawrence Livermore National Laboratory), David Beckingsale (Lawrence Livermore National Laboratory), David Boehme (Lawrence Livermore National Laboratory), Frank Mueller (North Carolina State University), Todd Gamblin (Lawrence Livermore National Laboratory)

**Massively Parallel Automated Software Tuning**  
Jakub Kurzak (University of Tennessee), Yaoehung Tsai (University of Tennessee), Mark Gates (University of Tennessee), Ahmad Abdelfattah (University of Tennessee), Jack Dongarra (University of Tennessee)

**Exploiting Vector Processing in Dynamic Binary Translation**  
Chih-Min Lin (National Taiwan University), Sheng-Yu Fu (National Taiwan University), Ding-Yong Hong (Academia Sinica), Yu-Ping Liu (National Taiwan University), Jan-Jan Wu (Academia Sinica), Wei-Chung Hsu (National Taiwan University)

**Session T8C**

**Cosin: Controllable Social Influence Maximization and Its Distributed Implementation in Large-scale Social Networks**  
Jingya Zhou (Soochow University, State Key Laboratory for Novel Software Technology), Jianxi Fan (Soochow University, Provincial Key Laboratory for Computer Information Processing Technology), Jin Wang (Soochow University, Provincial Key Laboratory for Computer Information Processing Technology)

**Approximate Code: A Cost-Effective Erasure Coding Framework for Tiered Video Storage in Cloud Systems**  
Huayi Jin (Shanghai Jiao Tong University), Chentao Wu (Shanghai Jiao Tong University), Xin Xie (Shanghai Jiao Tong University), Jie Li (Shanghai Jiao Tong University), Minyi Guo (Shanghai Jiao Tong University), Hao Lin (The Alibaba Group), Jianfeng Zhang (The Alibaba Group)

**VScan: Efficiently Analyzing Surveillance Videos via Model-joint Mechanism**  
Chen Zhang (Huazhong University of Science and Technology), Qiang Cao (Huazhong University of Science and Technology), Jie Yao (Huazhong University of Science and Technology), Yuanyuan Dong (Alibaba Group), Puyuan Yang (Alibaba Group)

**Faster parallel collision detection at high resolution for CNC milling applications**  
Xin Chen (Georgia Tech), Dmytro Konobrytskyy (Uber Advanced Technologies Group), Thomas M. Tucker (Tucker Innovations Inc.), Thomas R. Kurfess (Georgia Tech), Richard W. Vuduc (Georgia Tech)
Thursday, August 8th

15:40-16:00  
**Coffee Break**
Banquet Hall
2F Foyer

16:00-17:15  
**Session T9A**  
Neural Networks  
Chair: Toshihiro Hanawa
Buzz Hall

**An Efficient Design Flow for Accelerating Complicated-connected CNNs on a Multi-FPGA Platform**  
Deguang Wang (National University of Defense Technology), Junzhong Shen (National University of Defense Technology), Mei Wen (National University of Defense Technology), Chunyuan Zhang (National University of Defense Technology)

**A Unified Optimization Approach for CNN Model Inference on Integrated GPUs**  
Leyuan Wang (Amazon, UC Davis), Zhi Chen (Amazon), Yizhi Liu (Amazon), Yao Wang (Amazon), Lianmin Zheng (Shanghai Jiao Tong University), Mu Li (Amazon), Yida Wang (Amazon)

**Massively Parallel ANS Decoding on GPUs**  
Andre Weissenerger (Johann Wolfgang Goethe University), Bertil Schmidt (Johannes Gutenberg University of Mainz)

16:00-17:15  
**Session T9B**  
Parallel Data Structures  
Chair: Sivan Toledo
Room-1

**Building Scalable NVM-based B+tree with HTM**  
Mengxing Liu (Tsinghua University), Jiankai Xin (Tsinghua University), Kang Chen (Tsinghua University), Yongwei Wu (Tsinghua University)

**BCL: A Cross-Platform Distributed Data Structures Library**  
Benjamin A. Brock (University of California, Berkeley Lawrence Berkeley National Laboratory), Aydn Buluc (Lawrence Berkeley National Laboratory University of California, Berkeley), Katherine Yelick (Lawrence Berkeley National Laboratory University of California, Berkeley)

**On Integration of Appends and Merges in Log-Structured Merge Trees**  
Caixin Gong (Alibaba Group), Shuibing He (Zhejiang University), Yili Gong (Wuhan University), Yingchun Lei (Daowoo Times Tech. Co.)

16:00-17:15  
**Session T9C**  
IoT and Edge Computing  
Chair: Yohei Miki
Room-2

**NFV-Enabled Multicasting in Mobile Edge Clouds with Resource Sharing**  
Zichuan Xu (Dalian University of Technology), Yutong Zhang (Dalian University of Technology), Weifa Liang (The Australian National University), Qiften Xia (Dalian University of Technology), Omer Rana (Cardiff University), Alex Galis (University College London), Guowei Wu (Dalian University of Technology), Pan Zhou (Huazhong University of Science and Technology)

**QLEC: A Machine-Learning-Based Energy-Efficient Clustering Algorithm to Prolong Network Lifespan for IoT in High-Dimensional Space**  
Ke Li (Shanghai Jiao Tong University), Haowei Huang (Shanghai Jiao Tong University), Xiaofeng Gao (Shanghai Jiao Tong University), Fan Wu (Shanghai Jiao Tong University), Guihai Chen (Shanghai Jiao Tong University)

**Multi-Objective Reinforcement Learning for Reconfiguring Data Stream Analytics on Edge Computing**  
Alexandre da Silva Veith (Ecole Normale Superieure de Lyon, Inria), Felipe Rodrigo de Souza (Ecole Normale Superieure de Lyon, Inria), Marcos Dias de Assuncao (Ecole Normale Superieure de Lyon, Inria), Laurent Lefevre (Ecole Normale Superieure de Lyon, Inria), Julio Cesar Santos dos Anjos (Federal University of Rio Grande do Sul)