Parallel Applications Workshop, Alternatives to MPI+X

Held in conjunction with SC22:
The International Conference for High Performance Computing, Networking, Storage, and Analysis

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Monday, November 14th, 2022
Hybrid Event

Held in conjunction with SC22:
The International Conference for High Performance Computing, Networking, Storage, and Analysis

Organization

Parallel Applications Workshop

Alternatives to MPI+X

Monday, November 14th, 2022

- Workshop Chair
  - Karla Morris   - Sandia National Laboratories

- Organizing Committee
  - Michael Ferguson   - Hewlett Packard Enterprise
  - Elliott Slaughter   - SLAC National Accelerator Laboratory
  - Irene Moulitsas   - Cranfield University

- Program Committee Chairs
  - Bill Long   - Hewlett Packard Enterprise
  - Daniele Lezzi   - Barcelona Supercomputing Center

- Advisory Committee
  - Bradford L. Chamberlain   - Hewlett Packard Enterprise
  - Damian W. I. Rouson   - Lawrence Berkeley National Laboratory
  - Katherine A. Yelick   - Lawrence Berkeley National Laboratory

Program Committee

Parallel Applications Workshop

Alternatives to MPI+X

Monday, November 14th, 2022

- David Bunde — Knox College
- Barbara Chapman — HPE and Stony Brook University
- Lúcia María de Assumpcao Drummond — Universidade Federal Fluminense
- Sally Ellingson — University of Kentucky
- Michael Ferguson — Hewlett Packard Enterprise
- Salvatore Filippone — Università di Roma Tor Vergata
- Dounia Khaldi — Intel
- Eric Laurendeau — Polytechnique Montreal
- Daniele Lezzi — Barcelona Supercomputing Center
- Laércio Lima Pilla — CNRS and University of Bordeaux
- Bill Long — Hewlett Packard Enterprise
- Francesc Lordan — Barcelona Supercomputing Center
- Esteban Meneses Rojas — National High Technology Center
- Karla Morris — Sandia National Laboratories
- Irene Moulitsas — Cranfield University
- Swaroop S. Pophale — Oak Ridge National Laboratory
- Mitsuhisa Sato — RIKEN Center for Computational Science
- Christine Sweeney — Los Alamos National Laboratory
- Elliott Slaughter — SLAC National Accelerator Laboratory
- Kenjiro Taura — University of Tokyo
- Sean Treichler — NVIDIA
- Richard W Vuduc — Georgia Institute of Technology

Pictures and Videos

- Pictures and Video Committee Chair
    - Irene Moulitsas   - Cranfield University

- Pictures and Video Review Committee
    - Dan Bonachea   - Lawrence Berkeley National Laboratory
    - Valentin Churavy   - Massachusetts Institute of Technology
    - Karl Jenkins   - Cranfield University
    - Stavros Kassinos   - University of Cyprus
    - Lee Margetts   - Manchester University
    - Hari Radhakrishnan   - NIPD Genetics
    - Soren Rasmussen   - UCAR

Program

Parallel Applications Workshop

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Monday, November 14th, 2022

8:30   - Welcome and Introduction

8:32   - **Survey of Technologies for Developers of Parallel Applications**

10:00 - Break (30 minutes)

10:30 - **Session 1**

12:00 - Lunch (90 minutes)

1:30   - **Distinguished Speaker:**
          Jaqueline Chen - Sandia National Laboratories
          *"The Convergence of Exascale Computing, Data Science and Visualization
          Towards Zero-Carbon Fuels for Power and Transportation"*

2:18   - **Session 2**

3:00   - Break (30 minutes)

3:30   - **Panel Discussion**

Survey of Technologies for Developers of Parallel Applications -- 8:32 – 10:00

- Please take a moment to give us feedback!
  - LINK https://tinyurl.com/PAW-ATM2022-feedback (goes to official SC22 Site)

- Coming Up

  8:32 -   Daniele Lezzi
            Barcelona Supercomputing Center

  8:52 -   Olivier Aumage
            French Institute for Research in Computer Science and Automation

  9:18 -   William Long
            Hewlett Packard Enterprise

  9:38 - Michelle Strout
            Hewlett Packard Enterprise

  9:52 -   Q&A

PAW ATM

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SC22

Session #1 -- 10:30 – 12:00

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- Coming Up

    10:30 - *Extending OpenMP and OpenSHMEM for Efficient Heterogeneous Computing*
    Wenbin Lu, Shilei Tian, Tony Curtis, and Barbara Chapman

    10:52 - *Task Fusion in Distributed Runtimes*
    Shiv Sundram, Wonchan Lee, and Alex Aiken

    11:14 - *Composition of Algorithmic Building Blocks in Template Task Graphs*
    Thomas Herault, **Joseph Schuchart**, Edward F. Valeev, and George Bosilca

    11:37 - *Asynchronous Workload Balancing through Persistent Work-Stealing and Offloading for a Distributed Actor Model Library*
    Yakup Budanaz, **Mario Wille**, and Michael Bader

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SC22

Session #2 -- 1:30 – 3:00

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- Coming Up

  1:30 - **Distinguished Speaker:**
          Jaqueline Chen - Sandia National Laboratories
          The Convergence of Exascale Computing, Data Science and Visualization Towards Zero-Carbon Fuels for Power and Transportation

  2:18 - *GASNet-EX RMA Communication Performance on Recent Supercomputing Systems*
          Paul H. Hargrove, and Dan Bonachea

  2:38 - *Design and Performance Evaluation of UCX for Tofu-D Interconnect with OpenSHMEM-UCX on Fugaku*
          Yutaka Watanabe, Taisuke Boku, Mitsuhisa Sato

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SC22
Dallas, TX | hpc accelerates.

Panel Discussion -- 3:30 – 5:00

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- Panel Moderator
  - Anshu Dubey   - Argonne National Laboratory

- Panelists
  - Rosa Badia   - Barcelona Supercomputing Center
  - Jacqueline Chen   - Sandia National Laboratories
  - Ethan Gutmann   - National Center for Atmospheric Research
  - Zhihao Jia   - Carnegie Mellon University
  - Bill Reus   - US Department of Defense
  - Damian Rouson   - Lawrence Berkeley National Laboratory