Scalable Algorithms for Large-Scale Systems

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SC11

- Scale and complexity of computer architectures

- Growing complexity of science applications

- Need for fault tolerance and fault resilience for mlti-petaflop and exa-flop systems

- Need for novel scalable mathematical models, algorithms and system software that address the scalability and resilience challenges.

Workshop Program:

08:50-09:00: Opening - **Prof. Vassil Alexandrov (BSC, Spain)**

09:00-09:45: Invited talk - *"The low-power Architecture Approach Towards Exascale Computing,"* **Prof. Alex Ramirez (BSC, Spain)**

09:45-10:35: Contributed Papers

- *"Implementing a Gaussian Process Learning Algorithm in Mixed Parallel Environment,"* **V. Chandola (ORNL, USA)** and R. Vatsavai (ORNL, USA)

- *"Scalable and Fault Tolerant Orthogonalization Based on Randomized Aggregation,"* **W. Gansterer (UoV, Austria)**, G. Niederbrucker (UoV, Austria), H. Strakova (UoV, Austria), and S. Grotthoff (UoV, Austria)

10:35-11:00: Coffee Break

Workshop Program:

11:00-11:45: Invited talk - *"A Holistic Approach for Exascale Resilience,"* **Prof. Franck Cappello (INRIA/UIUC, France/USA)**

11:45-12:35: Contributed Papers

- *"Soft Error Resilient QR Factorization for Hybrid System with GPGPU,"* **P. Du (UT, USA)**, P. Luszczek (UT, USA), S. Tomov (UT, USA), and J. Dongarra (UT/ORNL/UoM, USA/UK)

- *"On Non-Blocking Collectives in 3D FFTs,"* **R. Saksena (Fujitsu, UK)**

12:35-13:50: Lunch Break

Workshop Program:

13:50-14:35: Invited talk - *"Top down Programming Methodology and Tools with StarSs - Enabling Scalable Programming Paradigms,"* **Prof. Rosa Badia (BSC, Spain)**

14:35-15:00: Contributed Papers

- *"Layout-aware Scientific Computing - A Case Study with MILC,"* **J. He (IIT, USA)**, J. Kowalkowski (FNAL, USA), M. Paterno (FNAL, USA), D. Holmgren (FNAL, USA), J. Simone (FNAL, USA), and X. Sun (IIT, USA)

15:00-15:45: Invited talk - *"On the Future of High Performance Computing: How to Think for Peta and Exascale Computing,"* **Prof. Jack Dongarra (UT/ORNL/UoM, USA/UK)**

15:45-16:00: Coffee Break

Workshop Program:

16:00-17:15: Papers

- *"Fault Tolerant Matrix-Matrix Multiplication: Correcting Soft Errors On-Line,"* **P. Wu (CSM, USA)**, C. Ding (CSM, USA), L. Chen (CSM, USA), T. Davies (CSM, USA), C. Karlsson (CSM, USA), and Z. Chen (CSM, USA)

- *"Performance Analysis of a Cardiac Simulation Code Using IPM,"* **P. Strazdins (ANU, Australia)**, and M. Hegland (ANU, Australia)

- *"Investigating Scaling Behaviour of Monte Carlo Codes for Dense Matrix Inversion,"* V. Alexandrov (BSC, Spain) and **J. Straßburg (UoR, UK)**

17:15-17:30: Concluding Remarks - **Prof. Vassil Alexandrov (BSC, Spain)**