31st Euromicro International Conference on Parallel, Distributed and Network-Based Processing

Naples, Italy

CONFERENCE SCHEDULE

Day 1, 1 Marzo 2023

8:00AM - 9:15AM

MAIN HALL

Registration and welcome espresso

9:15AM-10:30AM

TEATRO

Opening Ceremony

Welcome message by Prof. Raffaele Montella, general chair.

Speakers:

Prof. Antonio Garofalo, Rector of the University of Naples "Parthenope"

Prof. Andrea Soricelli, Head of the School of Science, Engineering and Health, University of Naples "Parthenope"

Karl-Erwin Grosspietsch, Euromicro Chair

10:30AM-11:15AM

TEATRO

Keynote – Distributed computing disrupts. Discuss.

Brendan Bouffler

Head of Developer Relations - HPC Engineering at Amazon Web Services

Chair: Raffaele Montella, University of Naples “Parthenope”

11:15AM - 11:30AM

SALA WAGNER

Coffee Break

11:30AM-1:00PM

TEATRO

Main Track

Chair: Karl-Erwin Grosspietsch, Euromicro

Karthick Panner Selvam and Mats Brorsson: *Performance Analysis and Benchmarking of a Temperature Downscaling Deep Learning Model*

Shoichi Hirasawa and Michihiro Koibuchi: *An Auto-Tuning Method for High-Bandwidth Low-Latency Approximate Interconnection Networks*
Diana Di Luccio, Ciro Giuseppe De Vita, Gennaro Mellone, Raffaele Montella, Marco Lapegna, Gloria Ortega, Livia Marcellino, Enrico Zambianchi, and Giulio Giunta: *A highly scalable high-performance Lagrangian transport and diffusion model for marine pollutants assessment*
Marcelo Koji Moori, Hiago Mayk G. de A. Rocha, Matheus Almeida Silva, Janaína Schwarzrock, Arthur Lorenzon, and Antonio Carlos Schneider Beck Filho: *Automatic CPU-GPU Allocation for Graph Execution*

SALA PROCIDA

BDCSA2023: Big Data Convergence: from Sensors to Applications

Chair: Jesus Carretero, University Carlos III of Madrid

Jesus Carretero and Cristhian Martinez: *Blockchain-based schemes for continuous verifiability and traceability of IoT data*
Javier Garcia Blas, Cosmin Octavian Petre, Genaro Juan Sanchez Gallegos, and Jesus Carretero: *Network accelerated in-memory ad-hoc file system for data-centric and high-performance applications*
David E. Singh, Alvaro Arbe Milara, and Jesus Carretero: *Energy-aware malleable scheduling techniques*
Paula Ferrero-Roza, José A. Moríñigo, and Filippo Terragni: *Scaling of the SVD Algorithm for HPC Science: A PETSc-based Approach*

11:30AM-1:00PM

AWS ACADEMY

SALTCSMLNHPC2023: Scalable Algorithms, Libraries and Tools for Computational Science and Machine Learning on New Heterogeneous HPC Systems

Chair: Salvatore Cuomo, University of Naples “Federico II”

Raúl Marichal, Guillermo Toyos, Ernesto Dufrechou, and Pablo Ezzatti: Evaluation of architecture-aware optimization techniques for Convolutional Neural Networks
Bruno Galluzzi, Stefano Izzo, Fabio Giampaolo, Salvatore Cuomo, Marco Vanoni, Lilia Alberghina, Chiara Damiani, and Francesco Picciali: Coupling constrained-based flux sampling and clustering to tackle cancer metabolic heterogeneity
Kashif Qureshi, Noman Arshad, and Thomas Newe: Intrusion Detection Systems for Cyber Attacks Detection in Power Line Communications Networks
Jia-Hao Syu, Jerry Chun-Wei Lin, Marcin Fojcik, and Rafal Cupek: HTPS: Heterogeneous Transferring Prediction System for Healthcare Datasets

1:00PM - 2:30PM

SALA WAGNER

Lunch

Buffet lunch with Italian specialties.

2:30PM-3:15PM

TEATRO

Keynote – Soft Computing in data integration and decision-making

Angelo Ciaramella

Full Professor at DiST University of Naples "Parthenope"

Chair: Jesús Carretero, Universidad Carlos III de Madrid

3:15PM - 3:30PM

SALA WAGNER

Coffee Break

3:30PM-5:30PM

TEATRO

Main Track

Chair: Valeria Mele, University of Naples "Federico II"

Lucas Leandro Nesi, Vinícius Garcia Pinto, Lucas Mello Schnorr, and Arnaud Legrand: *Summarizing task-based applications behavior over many nodes through progression clustering*

Adriano Vogel, Marco Danelutto, Dalvan Griebler, and Luiz Fernandes: *Revisiting self-adaptation for efficient decision-making at run-time in parallel executions*

Franz Biersack, Kilian Holzinger, Henning Stubbe, Thomas Wild, Georg Carle, and Andreas Herkersdorf: *Priority-aware Inter-Server Receive Side Scaling*

[ONLINE] Pasqua D'Ambra, Fabio Durastante, S M Ferdous, Salvatore Filippone, Mahantesh Halappanavar, and Alex Pothen: *AMG Preconditioners based on parallel hybrid coarsening and multi-objective graph matching*

SALA PROCIDA

BDCSA2023: Big Data Convergence: from Sensors to Applications

Chair: Katzalin Olcoz, Universidad Complutense de Madrid

Javier Campoy, Ignacio-Iker Prado-Rujas, José L. Risco-Martín, Katzalin Olcoz, and María S. Pérez: *Distributed training and inference of deep learning solar energy forecasting models*

Alvaro Cuartero-Montilla and Rafael Mayo-García: *Application of advanced Artificial Intelligence methodologies for the development of a gene therapy for the primary Hyperoxaluria*

Tommaso Marinelli, José Ignacio Gómez Pérez, Christian Tenllado, and Francky Catthoor: *Efficiency-Aimed Pattern Analysis and Data Mapping in Hybrid Cache-SPM Architectures*

Elías Del-Pozo-Puñal, Felix Garcia-Carballeria, and Diego Camarmas-Alonso: *ENIGMA: A Scalable Simulator for IoT and Edge Computing*

AWS ACADEMY

SALTCSMLNHPC2023: Scalable Algorithms, Libraries and Tools for Computational Science and Machine Learning on New

Heterogeneous HPC Systems

Chair: Francesco Piccialli, University of Naples "Federico II"

Nicolo Romandini, Carlo Mazzocca, and Rebecca Montanari: *Federated Learning Meets Blockchain: a Power Consumption Case Study*
Maria Pia De Rosa, Fabio Giampaolo, Francesco Piccialli, and Salvatore Cuomo: *Modelling the COVID-19 infection rate through a Physics-Informed learning approach*
Kevin Crampon, Alexis Giorkallos, Stéphanie Baud, and Luiz Angelo Steffenel: *Convolutional graph neural network training scalability for molecular docking*
Jie Lei, José Flich, and Enrique S. Quintana-Ortí: *Toward Matrix Multiplication for Deep Learning Inference on the Xilinx Versal*
[ONLINE] Tao Tao: *Synchronization Efficient Scheduling of Fine-grained Irregular Programs*

5:45PM - 8:30PM

MAIN HALL

Guided Tour (reservation needed)

Burbon Tunnel - Adventure Tour

Day 2, 2 Marzo 2023

9:00AM - 10:00AM

FRONTDESK

Reception & Coffee

10:00AM - 10:45AM

TEATRO

Keynote – Introducing the FaaS model in Complex HPC Workflows: The eFlows4HPC approach

Jorge Ejarque Artigas

Senior Research Engineer at Barcelona Supercomputing Center

Chair: A. Ciaramella (University of Naples "Parthenope")

10:45AM - 11:00AM

SALA WAGNER

Coffee Break

11:00AM-12:30PM

TEATRO

Main Track

Chair: Antonella Galizia, IMATI-CNR

Keisuke Sugiura and Hiroki Matsutani: *An Efficient Accelerator for Deep Learning-based Point Cloud Registration on FPGAs*

Midia Reshadi and David Gregg: *Dynamic Resource Partitioning for Multi-Tenant Systolic Array Based DNN Accelerator*
Jorge Villarrubia, Luis Costero, Francisco D. Igual, and Katzalin Olcoz: *Improving inference time in multi-TPU systems with profiled model segmentation*
Alberto Ottimo, Gabriele Mencagli, and Marco Danelutto: *FSP: a Framework for Data Stream Processing Applications targeting FPGAs*

SALA PROCIDA

HPCMS2023: High Performance Computing in Modelling and Simulation

Chair: William Spataro, University of Calabria

Marjan Firouznia, Pietro Ruiu, and Giuseppe A. Trunfio: *Robust feature selection for high-dimensional datasets using a GPU-accelerated ensemble of cooperative coevolutionary optimizers*
Luca Barillaro, Giuseppe Agapito, and Mario Cannataro: *Using Edge-based Deep Learning Model for Early Detection of Cancer*
Lorella Bottino, Marzia Settino, and Mario Cannataro: *Distributed ICT solutions for scoliosis management*
Alessio De Rango, Luca Furnari, Alfonso Senatore, Giuseppe Mendicino, Andrea Giordano, Davide Macrì, Gladys Utrera, and Donato D'Ambrosio: *Performance Analysis and Optimization of the CUDA Implementation of the Three-Dimensional Subsurface XCA-Flow Cellular Automaton*

AWS ACADEMY

TUTORIAL

E4 & ADMIRE

FlexMPI: Malleability Techniques and Applications in High-Performance Computing

12:30PM - 2:00PM

SALA WAGNER

Lunch

2:00PM-2:45PM

TEATRO

Keynote – Node-level efficiency and scalability issues in iterative sparse linear solvers at scale

Pasqua D'Ambra

Senior Research Scientist at Institute for Applied Computing of the National Research Council and CINI National Lab. on HPC-KTT

Chair: Marco Danelutto, University of Pisa

2:45PM - 3:00PM

SALA WAGNER

Coffee Break

3:00PM-4:30PM

TEATRO

Main Track

Chair: Giuliano Laccetti, University of Naples Federico II

Federica Uccello, Salvatore D'Antonio, Roberto Nardone, and Nicola Russo: A Tamper-Resistant Storage Framework for Smart Grid security
Marco Danelutto, Paolo Palazzari, Alberto Ottimo, Gabriele Mencagli, and Francesco Iannone: FastFlow targeting FPGAs
Ciro Giuseppe De Vita, Gennaro Mellone, Aniello Florio, Catherine Alessandra Torres Charles, Diana Di Luccio, Guido Benassai, Marco Lapegna, Giorgio Budillon, and Raffaele Montella: Parallel and hierarchically-distributed Shoreline Alert Model (SAM)
Giuseppe Coviello, Kunal Rao, Gennaro Mellone, Ciro Giuseppe De Vita, Priscilla Benedetti, and Srimat Chakradhar: Content-aware auto-scaling of stream processing applications on container orchestration platforms

SALA PROCIDA

HPCMS2023: High Performance Computing in Modelling and Simulation

Chair: Giuseppe Trunfio, University of Sassari

Luca Barillaro, Giuseppe Agapito, and Mario Cannataro: *High performance deep learning libraries for biomedical applications*
Natiele Lucca, Claudio Schepke, and Gabriel Dineck Tremarin: *Parallel Directives Evaluation in Porous Media Application: A Case Study*
Arianna Anniciello and Elio Masciari: *A Judgment Aggregation Method For Fuzzy Multi Criteria Decision Making*
Andrea Giordano, Donato D'Ambrosio, Davide Macrì, Rocco Rongo, William Spataro, Gladys Utrera, and Marisa Gil: *OpenCAL++: An object-oriented architecture for transparent Parallel Execution of Cellular Automata models*

AWS ACADEMY

TUTORIAL

E4 & ADMIRE

FlexMPI: Malleability Techniques and Applications in High-Performance Computing

4:30PM - 6:00PM

TEATRO

Industrial Session

E4 Computer Engineering

7:00PM - 11:00PM

SALA WAGNER

Aperitivo & Social Dinner (reservation needed)

Day 3, 3 Marzo 2023

9:00AM - 10:00AM

FRONTDESK

Reception & Coffee

10:00AM - 10:45AM

TEATRO

Keynote – A solution for real-time streaming applications

Giuseppe Coviello

Researcher in Integrated Systems at NEC Labs America

Chair: Marco Lapegna, University of Naples “Federico II”

10:45AM - 11:00AM

SALA WAGNER

Coffee Break

Italian coffee, juices and pastries.

11:00AM-12:30PM

TEATRO

Main Track

Chair: Marco Lapegna, University of Naples “Federico II”

Aymar Cublier Martínez, Alejandro Álvarez Isabel, Jesús Carretero, and David E. Singh: *Fine-grained parallel social modelling for analyzing the COVID-19 propagation*
Iker Martín Álvarez, José Ignacio Aliaga, Maribel Castillo, and Sergio Iserte: *Configurable synthetic application for studying malleability in HPC*
Paulo Souza, Carlos Kayser, Lucas Roges, and Tiago Ferreto: *Thea – a QoS, Privacy, and Power-aware Algorithm for Placing Applications on Federated Edges*
Gennaro Mellone, Ciro Giuseppe De Vita, Dante Domizzi Sánchez-Gallegos, Diana Di Luccio, Gaia Mattei, Francesco Peluso, Pietro Patrizio Ciro Aucelli, Angelo Ciaramella, and Raffaele Montella: *A containerized distributed processing platform for autonomous surface vehicles: preliminary results for marine litter detection*

SALA PROCIDA

CCIaaSA2023: Cloud Computing on Infrastructure as a service and its Applications

Chair: Emanuel Di Nardo, University of Naples “Parthenope”

Lucía Pons, Salvador Petit, Julio Pons, Maria E. Gomez, Chaoyi Huang, and Julio Sahuquillo: *Stratus: A Hardware/Software Infrastructure for Controlled Cloud Research*
Sezar Jarrous-Holtrup, Sergei Gorlatch, Michael Dey, and Folker Schamel: *Multi-Cloud Container Orchestration for High-Performance Real-Time Online Applications*

AWS ACADEMY

CC2023: Compute Continuum

Chair: Maria Fazio, University of Messina

Francesco Martella, Valeria Lukaj, Maria Fazio, Antonio Celesti, and Massimo Villari: *On-Demand and Automatic Deployment of Microservice at the Edge Based on NGSI-LD*
Gabriele Russo Russo, Valeria Cardellini, and Francesco Lo Presti: *Serverless Functions in the Cloud-Edge Continuum: Challenges and Opportunities*
Yasir Arfat, Gianluca Mittone, Iacopo Colonnelli, Fabrizio D'Ascenzo, Roberto Esposito, and Marco Aldinucci: *Pooling critical datasets with Federated Learning*

Loris Belcastro, Fabrizio Marozzo, Alessio Orsino, Domenico Talia, and Paolo Trunfio: *Using the Compute Continuum for Data Analysis: Edge-cloud Integration for Urban Mobility*

12:30PM - 2:00PM

SALA WAGNER

Lunch

2:00PM-2:45PM

TEATRO

Keynote – Frauds in the Cryptocurrency Ecosystem

Alessandro Mei

Full Professor at Department of Computer Science at Sapienza University of Rome

Chair: Jorge Ejarque Artigas, Barcelona Supercomputing Center

2:45PM - 3:00PM

SALA WAGNER

Coffee Break

3:00PM-4:30PM

TEATRO

Main Track

Chair: Javier Garcia Blas, Universidad Carlos III de Madrid

Julen Galarza, Javier Navaridas, Jose A. Pascual, Juan L Muñoz, Ibon Bustinduy, and Txomin Romero: *Parallelizing Multipacting Simulation for the Design of Particle Accelerator Components*

Ryota Yasudo: *Bandit-based Variable Fixing for Binary Optimization on GPU Parallel Computing*

Thomas Jakobs, Sebastian Kratzsch, and Gudula Ruenger: *Analyzing Data Reordering of a combined MPI and AVX execution of a Jacobi Method*

Adriano Marques Garcia, Dalvan Griebler, Claudio Schepke, André Sacilotto Santos, Jose Daniel Garcia, Javier Fernandez Muñoz, and Luiz Gustavo Fernandes: *A Latency, Throughput, and Programmability Perspective of GrPPI for Streaming on Multi-cores*

4:30PM-5:30PM

TEATRO

Awards and conclusions

Chair: Raffaele Montella, University of Naples “Parthenope”