Curriculum Vitae

Personal Data

Pietro Benedusi, Ph.D.

Numerical Simulation in Science, Medicine and Engineering research group at the Institute of Computational Science (ICS)
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Education and research

9/2009 – 4/2013	Bachelor degree in Physics at University of Pavia with thesis title: "Neutrino Oscillations".
9/2013 – 9/2015	Master degree with summa cum laude in Applied Mathematics and Computational Science at USI with thesis "A Parallel Multigrid Solver for Time-periodic Incompressible Navier-Stokes Equations" at ETH Zurich within the Swiss mobility program.
1/2014 – 9/2015	Student assistant at ICS working on scalable algorithms for astrophysical applications.
10/2015 – 5/2020	Ph.D. student in Computational Science at ICS with adviser Prof. Rolf Krause. Part of the project "Exasovlers: Software for Exascale Computing" concerning the study and implementation of new numerical schemes for massive parallel machines exploiting parallelism in time for PDEs solvers.
8/2019 – 10/2019	Research visitor at Berkeley Lab under collaborating with Dr. Michael Minion on parallel-in-time methods.
from 6/2020	Joint postdoc at ICS and at the Locarno institute of solar research (IRSOL), working on the simulation of radiative transfer in stellar atmospheres.

Awards and events

2013	Finalist in the programming competition "Dyalog APL Worldwide programming contest".
2015	Winner of the grant "USIimpresa" as best student in the computer science faculty.
2017	Organization of the summer school at USI: "Generalized Locally Toeplitz Sequences: A Spectral Analysis Tool for Discretized Differential Equations".

2019	Winner of the SIAM Travel Award grant to attend the CSE19 conference held in Spokane, USA.

Talks and Posters

12/2015	Speaker at the CBC Workshop on Dynamic Adaptivity, Simula, Oslo.
3/2016	Speaker at SIAM PP16 conference, Paris.
6/2016	Speaker at ECCOMAS conference, Crete.
6/2016	Speaker at MAFELAP conference, London.
2/2017	Speaker at DD24 conference in Svalbard, Norway.
3/2017	Speaker at the 18th Copper Mountain Conference On Multigrid Methods, Copper Mountain, Colorado.
6/2017	Speaker at LSSC17 conference in Sozopol, Bulgaria.
10/2017	Speaker at the 6th Parallel in Time Workshop, Ascona, Switzerland.
20/4/2018	Poster at the Swiss Numerics Day, ETH, Zurich, Switzerland.
7/2018	Speaker at DD25 conference in St John's, Canada.
2/2019	Speaker at CSE19 conference in Spokane, USA.
20 – 24/5/2019	Speaker at the workshop "Advanced parallel-in-time algorithms for computer simulations in physical sciences, social sciences and engineering", held in Bielefeld, Germany.
08 – 12/6/2020	Speaker at the 9th Parallel in Time Workshop, held online.

Publications

[1] Bader, S. B., Benedusi, P., Quaglino, A., Zulian, P., and Krause, R.
Space-time multilevel Monte Carlo methods and their application to cardiac electrophysiology.
arXiv preprint arXiv:1911.06066 (2019).

[2] Benedusi, P.
Parallel space-time multilevel methods with application to electrophysiology.
PhD thesis, Università della Svizzera italiana, 2020.

[3] Benedusi, P., Ferrari, P., Garoni, C., Krause, R., and Serra-Capizzano, S.
Fast parallel solver for the space-time iga-dg discretization of the anisotropic diffusion equation, 2019.

[4] Benedusi, P., Garoni, C., Krause, R., Li, X., and Serra-Capizzano, S.
Space-time FE-DG discretization of the anisotropic diffusion equation in any Dimension: the spectral symbol.
SIAM Journal on Matrix Analysis and Applications 39, 3 (2018), 1383–1420.

[5] Benedusi, P., Hupp, D., Arbenz, P., and Krause, R.
A parallel multigrid solver for time-periodic incompressible Navier–Stokes equations in 3d.
In *Numerical Mathematics and Advanced Applications ENUMATH 2015*. Springer, 2016, pp. 265–273.

[6] Benedusi, P., Minion, M., and Krause, R.
An experimental comparison of a space-time multigrid method with PFASST for a reaction-diffusion problem.
arXiv preprint arXiv:2006.12883 (2020).

[7] Grasedyck, L., Löbbert, C., Wittum, G., Nägel, A., Schulz, V., Siebenborn, M., Krause, R., Benedusi, P., Küster, U., and Dick, B.
Space and time parallel multigrid for optimization and uncertainty quantification in PDE simulations.
In *Software for Exascale Computing-SPPEXA 2013-2015*. Springer, 2016, pp. 507–523.

[8] Kreienbuehl, A., Benedusi, P., Ruprecht, D., and Krause, R.
Time-parallel Gravitational Collapse Simulation.
Communications in Applied Mathematics and Computational Science 12, 1 (2017), 109–128.

[9] Li, X., Benedusi, P., and Krause, R.
An iterative approach for time integration based on discontinuous Galerkin methods.
arXiv preprint arXiv:1610.01324 (2016).