

CURRICULUM VITAE

FORMATO EUROPEO/EUROPEAN FORMAT

INFORMAZIONI PERSONALI/ PERSONAL INFORMATION

Nome, Cognome/Name, Surname

PASQUA D'AMBRA

Indirizzo/Address

Via, numero civico, c.a.p., città,
nazione/ House number, street
name, postcode, city, country

Telefono/Telephone

Fax

E-mail

Sito web/Website

Nazionalità/Nationality

Italian

Luogo e data di nascita/ Place and
Date of birth

ESPERIENZA PROFESSIONALE/ WORK EXPERIENCE

Se dipendente CNR indicare:

QUALIFICA PRIMO RICERCATORE

In ordine di data /Dates (from – to)

[Iniziare con le più recenti ed
elencare separatamente ciascun
incarico ricoperto/ Add separate
entries for each relevant post
occupied, starting with the most
recent.]

- CNR Permanent Senior Scientist at the Institute for Applied Computing “M. Picone” (IAC)-CNR, from March 2016.
- CNR Permanent Senior Scientist at the Institute for High-Performance Computing and Networking (ICAR)-CNR, from January 2004 till March 2016.
- Visiting Researcher at the Portland State University (OR-USA), October 2017, February 2018, February 2019.
- Visiting Researcher at the Center for Applied Scientific Computing (CASC) of the Lawrence Livermore Laboratory (LLNL), CA, USA, June-July 2011, August 2013, October 2016.
- Adjunct Professor of Numerical Computing at the University of Campania “L. Vanvitelli”, since 2003.
- CNR Permanent Scientist at the Center for Parallel Computers and Supercomputing (CPS)-CNR, 1997-2003.
- Visiting Researcher at the Center for Advanced Computing Research (CACR) of the California Institute of Technology (CalTech), CA, USA, July 1998.
- CNR Temporary Scientist at CPS-CNR, 1994-1997.
- IBM Research fellow at the European Center for Scientific and Engineering Computing (ECSEC), in Rome, 1992.
- Ph.D. Student at the University of Naples Federico II, 1990-1994.
- CNR Post-Laurea fellow at CPS-CNR, 1991-1992.
- CNR Laurea fellow at the Department of Mathematics and its Applications of the University of Naples Federico II, 1990.

Nome e indirizzo del datore di lavoro / Name and address of employer	National Research Council of Italy (CNR)
Tipo o settore di attività / Type of business or sector	Public Research
Funzione o posto occupato / Occupation or position held	Senior Research Scientist
Principali mansioni e responsabilità / Main activities and responsibilities	Responsible for CNR and WP Leader of the Project "Energy Oriented Center of Excellence (EoCoE II): Toward Exascale for Energy". A Center of Excellence in Computing Applications. Horizon 2020 Program for Research and Innovation, funded by European Commission (EC), grant N. 824158. Responsible for CNR and Task Leader of the Project "Towards EXtreme scale Technologies and Accelerators for euROhpc hw/Sw Supercomputing Applications for exascale (TEXTAROSSA)". EuroHPC Project, Horizon 2020 Program for Research and Innovation, funded by European Commission (EC), grant N. 956831.

**ISTRUZIONE E FORMAZIONE /
EDUCATION AND TRAINING**

In ordine di data /Dates (from – to)

[Iniziare con le più recenti ed
elencare separatamente ciascun
corso frequentato con successo/ Add
separate entries for each relevant
course you have completed, starting
with the most recent.]

- Ph.D. in Applied Mathematics and Computer Science, February 1995.
- Laurea degree (MS), cum laude, in Mathematics, from University of Naples Federico II, July 1990.

**ATTIVITA' DI RICERCA /
RESEARCH ACTIVITIES**

Attuali campi di ricerca / Research
sectors

Main activities are in designing and developing numerical methods, algorithms and mathematical software for high-performance scientific computing. In this context activities are carried on in the area of Parallel Numerical Linear Algebra and Parallel Solution of Partial/Ordinary Differential Equations with applications to Fluid Dynamics and Image/Data Analysis.

Recenti attività scientifiche/ Recent Scientific Activities.

Design, implementation and analysis of methods, algorithms and software for:

- algorithms and software for spectral clustering of large networks;
- adaptive Algebraic Multilevel Methods for general linear systems, based on compatible weighted matching (BootCMatch e BootCMatchG, available at <https://github.com/bootcmatch/>);
- parallel algebraic multilevel preconditioning of sparse linear systems (AMG4PSBLAS: AMG for PSBLAS, available at <https://psctoolkit.github.io/>);
- scalable algorithms and software for image segmentation based on variational models;
- parallel simulation of turbulent flows, based on LES formulation and multilevel solvers;
- parallel and distributed simulation of combustion in engine applications, based on detailed kinetics models and adaptive solvers for ordinary differential equations.

The above activities have been carrying out in the context of the following main projects:

- 2021-2024 Towards EXtreme scale Technologies and Accelerators for euROhpc hw/Sw Supercomputing Applications for exascale (TEXTAROSSA), EuroHPC Project, Horizon 2020 Program for Research and Innovation, funded by European Commission (EC).
- 2019-2022 *Energy Oriented Center of Excellence (EoCoE II): Toward Exascale for Energy* A Center of Excellence in Computing Applications. Horizon 2020 Program for Research and Innovation, funded by European Commission (EC).
- 2015-2018 *Energy Oriented Center of Excellence (EoCoE)*, A Center of Excellence in Computing Applications. Horizon 2020 Program for Research and Innovation, funded by European Commission (EC);
- 2013-2015 *Public-private laboratory for the development of integrated informatics tools for genomics, proteomics and transcriptomics (LAB GTP)*, funded by MIUR; - 2013 *Numerical Methods and Software for Large-Scale Optimization with Applications to Image Processing*, funded by INdAM-GNCS;
- 2012-2013 *INTEROMICS*, funded by Italian Ministry for University and Scientific Research (MIUR);
- 2012 INdAM-GNCS Project on Numerical Algorithms and Software for Preconditioning Linear Systems in the Solution of PDE and Optimization Problems, funded by INdAM-GNCS; ;
- 2009-2012 COADVISE: Co-advising PhD for IT Research in the Mediterranean Region, Marie Curie Action, EU VII Framework Program;
- 2007-2009 Numerical Simulations of Reactive Flows in Grid Environments, International Cooperation Project, funded by CNR and Bulgarian Academy of Science;
- 2006-2008 Numerical Computing for Groundwater Flows, INRIA Program 3+3 Méditerranée, funded by INRIA (FR).

Ulteriori informazioni / Additional information

Recent Conference Organization:

- Co-organizer of the special session on *European High-Performance Scientific Computing: Opportunities and Challenges for Applied Mathematics*, in the context of the SIMAI (Italian Society for Industrial and Applied Mathematics) Congress, Parma (IT), August-September 2021;
- Co-organizer of the special session on *High-performance modeling of renewables production: facing the exascale*, in the context of the SIAM Conference on Mathematical & Computational Issues in the Geosciences, Milan (IT), June 2021.

Recent Contribution to Editorial activity:

- Member of Editorial Board of Transactions on Parallel and Distributed Systems, IEEE; Numerical Linear Algebra with Applications, John Wiley & Sons Ltd.; Mathematics, MDPI Open Access Journal.

Pasqua D'Ambra is co-author of more than 70 publications in international journals, volumes and proceedings books and co-editor of many journal issues and proceedings books (see <https://orcid.org/0000-0003-2047-4986> for a complete list). She is member of Scientific/Program Committees of International Conferences on her research topics. She has been teaching undergraduate and graduate courses and supervising thesis on "Numerical Computing" and "Computer Science" in the University of Naples Federico II, the University of Naples Parthenope and the Second University of Naples, since 1991.

She is reviewer for international journals in the areas of Parallel Computing and Applied Mathematics and serves as expert project evaluator for European Community and French National Research Agency.

Scientific Societies and Groups

- Member of SIAM (International Society of Industrial and Applied Mathematics)
- Member of SIMAI (Italian Society of Industrial and Applied Mathematics)
- Member of GNCS (Italian National Group for Scientific Computing)
- Member of ERCIM WG on "Computational and Methodological Statistics"

Publicazioni/ Books and Articles

Last 5 years main publications:

Journals

- [1] P. D'Ambra, F. Durastante, S. Filippone, AMG Preconditioners for Linear Solvers towards Extreme Scale, SIAM Journal on Scientific Computing, August 2021, <https://doi.org/10.1137/20M134914X>.
- [2] M. Bernaschi, P. D'Ambra, D. Pasquini, BootCMatchG: An adaptive Algebraic MultiGrid linear solver for GPUs. Software Impacts. Vol. 6, 2020. <https://doi.org/10.1016/j.simpa.2020.100041>
- [3] M. Bernaschi, P. D'Ambra, D. Pasquini, AMG based on compatible weighted matching on GPUs. Parallel Computing. Vol. 92, 2020. <https://doi.org/10.1016/j.parco.2019.102599>
- [4] P. D'Ambra, P. S. Vassilevski, Improving solve time of aggregation-based adaptive AMG. Numerical Linear Algebra with Applications, Vol. 26, e2269, <https://doi.org/10.1002/nla.2269>, 2019.
- [5] P. D'Ambra, L. Cuttillo, P. S. Vassilevski, Bootstrap AMG for Spectral Clustering. Computational and Mathematical Methods. Vol. 1, e1020, <https://doi.org/10.1002/cmm4.1020>, 2019.
- [6] A. Abdullahi, V. Cardellini, P. D'Ambra, D. di Serafino, S. Filippone, Efficient Algebraic Multigrid Preconditioners on Clusters of GPUs. Parallel Processing Letters. Vol. 29, N.1, 2019.
- [7] P. D'Ambra, S. Filippone, P. S. Vassilevski, BootCMatch: a Software Package for Bootstrap AMG Based on Graph Weighted Matching, ACM Transactions on Mathematical Software, Vol.44, 39:1-39:25, 2018.
- [8] P. D'Ambra, S. Filippone, A Parallel Generalized Relaxation Method for High-Performance Image Segmentation on GPUs, J. of Computational and Applied Mathematics, Vol. 293, 2016.

[9] M. Bernaschi, P. D'Ambra, et al., TEXTAROSSA: Towards EXtreme scale Technologies and Accelerators for euROhpc hw/Sw Supercomputing Applications for exascale, Proc. of the 24th Euromicro Conference on Digital System Design (DSD). IEEE Pub., September 2021. <https://doi.org/10.1109/DSD53832.2021.00051>

[10] A. Abdullahi, P. D'Ambra, D. di Serafino, S. Filippone, Parallel Aggregation Based on Compatible Weighted Matching for AMG, Large Scale Scientific Computing. LSSC 2017. I. Lirkov, S. Margenov eds., Lecture Notes in Computer Science, Vol. 10665, Springer, Cham, 2018.

[11] P. D'Ambra, P. S. Vassilevski, Adaptive AMG based on Weighted Matching for Systems of Elliptic PDEs arising from Displacement and Mixed Methods, Progress in Industrial Mathematics at ECMI 2014, Proc. of the 18th European Conference on Mathematics for Industry, Springer, Series on Mathematics in Industry, Vol. 22, 2016.

**TRATTAMENTO DEI DATI
PERSONALI, INFORMATIVA E
CONSENSO**

Il D.Lgs. 30/6/2003, n. 196 "*Codice in materia di protezione dei dati personali*" regola il trattamento dei dati personali, con particolare riferimento alla riservatezza, all'identità personale e al diritto di protezione dei dati personali; l'interessato deve essere previamente informato del trattamento .

La norma in considerazione intende come "trattamento" qualunque operazione o complesso di operazioni concernenti la raccolta, la registrazione, l'organizzazione, la conservazione, la consultazione, l'elaborazione, la modifica, la selezione, l'estrazione, il raffronto, l'utilizzo, l'interconnessione, il blocco, la comunicazione, la diffusione, la cancellazione e la distruzione di dati, anche se non registrati in una banca dati.

In relazione a quanto riportato, autorizzo il CNR al trattamento dei dati contenuti nel presente *curriculum vitae* e nella documentazione della quale fa parte integrante, sollevandolo da ogni responsabilità e autorizzandolo alla pubblicazione, nel sito web del CNR, della relazione inerente alle proprie ricerche svolte durante il soggiorno finanziato dal CNR nell'ambito del Programma STM . Inoltre acconsento all'aggiornamento delle informazioni intranet che mi riguardano sia relative le pubblicazioni sia alle ricerche svolte.

(*barrare la casella*)

Si, acconsento

September 2021

Pasqua D'Ambra