

**Curriculum Vitae
DONATO PERA**

Name/ Surname DONATO PERA

E-mail donato.pera@univaq.it

Current Job

Research Fellow Mathematical Analysis

University
University of L'Aquila

Department

Department of Information Engineering , Computer Science and Mathematics

Training or research activities at qualified Italian or foreign institutes

Course attendance Scientific and Technical computing in Fortran95 language CASPUR, Roma 15-17 December 2009.

Course attendance Introduction to HPC and parallel computing CASPUR, Roma 11-13 Maggio 2010.

Course attendance GPU programming , CASPUR Roma 9-10 December 2010.

Attendance to 13th Advanced School on Parallel Computing (PRACE), CINECA Casalecchio di Reno (BO), 13-17 February 2017.

Course attendance Programming paradigms for GPU devices (PRACE), CINECA Casalecchio di Reno(BO), 18-20 April 2018.

Attendance to PUMPS+AI2018 (PRACE), Programming and Tuning Massively Parallel Systems+Artificial Intelligence Summer School Barcelona Supercomputing Center, Spain, July 16-20 2018.

Study visits at UNAM (Univesidad Nacional Autonoma de Mexico) from 12/11/2011 to 09/12/2011, (MAE prot. MAE02751092011-10-07), from 17/06/2012 to 30/06/2012 (MAE prot. MAE01275642012-05-16) and from 1/12/2013 to 13/12/2013 (MAE prot. MAE02530172013-11-11) for the International research projects Italy-Mexico: Analytical and numerical study of partial differential equations in the modeling of reaction and transport phenomena, characterized by the formation of complex structures , sponsored by Consejo Nacional de Ciencia y Tecnología (CONACyT Mexico) and the Italian Ministry of Foreign Affairs (MAE Program, Grant No.146529), 2011-2013.

Attendance to the workshop "Perspectives of GPU computing on Physics and Astrophysics" 15-17 September 2014 at Sapienza University Rome.

Attendance to XIV Biennial Conference of the Italian Society of Applied and Industrial Mathematics Sapienza Università di Roma Faculty of Civil and Industrial Engineering Rome, July 5, 2018.

Erasmus+ grant (technical staff) academic year 2015/2016 with "D.D.G. rep.n.370 prot. n. 10078 -1/04/2016" University of L'Aquila.

High Performance Computing training activities at EPCC University of Edimburg (UK) from 13 to 16 June 2016.

Attendance to the workshop on front propagation methods and HPC simulation of biological systems- University of Cote D'Azur -Department of Mathematics and Polytech Nice- January 27th-30th 2020.

Other professional experiences

Academic years
2020-2021, 2021-2022

Teaching assistant (University of L'Aquila-DISIM)

- 1) Parallel computing Laboratory
- 2) Parallel computing

Academic year
2019-2020

Teaching assistant (University of L'Aquila-DISIM)

- 1) High Performance Computing Laboratory and Application to Differential Equations
- 2) Parallel Computing Laboratory

From 24/12/2008 to 28/02/2023

High Performance Computing Engineer (D-area tecnica, tecnico scientifica ed elaborazione dati) University of L'Aquila-DISIM

From 04/07/2005 to 23/12/2008

Engineer Micron Technology Italia.

Education and training

Date 15/03/13
 Title PhD Engineering and Physics-Mathematical Modeling
 University University of L'Aquila

Date 30/04/08
 Title Master degree Mathematical-Physics Modeling for Engineering
 110/110 with honours
 University University of L'Aquila

Data 04/11/04
 Title Bachelor degree in Electronics Engineering
 105/110
 University University of L'Aquila

Personal linguistic skills and competences

Programming and management of high performance parallel computing systems in Linux/Unix environments based on both CPU and GPU.

Programming in C and Fortran environments with use of libraries for scientific computing such as: BLAS, LAPACK, CUDA, openMP, MPI with GNU, Intel and PGI compilers

System scheduler programming : Sun Grid Engine.

Environment programming: MATLAB, SCILAB, OCTAVE, FreeFem+, Trelis/Cubit.

Knowledge of Linux/Unix Operating Systems with reference to distributions Ubuntu, CentOS, Fedora, Rocks.

Knowledge TCP/IP protocol and Storage Area Network (SAN) systems

Linguistic Skills

Mother tongue **Italian**

Other languages

Self evaluation
European Level

English

French

Understanding		Speaking		Writing
Listening	Reading	Speaking Interaction	Speaking Production	
B2	B2	B2	B2	B2
A2	A2	A2	A2	A2

Teaching activity at university level in Italy or abroad

- 1) Teaching collaboration task internal call University of L'Aquila " D.D.G. n. 299-2014 prot. n. 11974 del 03/04/2014 for n.1 teaching collaborator (english language) on Department of Information Engineering , Computer Science and Mathematics for the Erasmus Mundus MathMods project for teaching support to the students that will use the the High Performance Parallel Computing del DISIM lab for their thesis. (From 26/05/2014 to 13/06/2014 total 50 hours at DISIM Univeristy of L'Aquila).
- 2) Teaching collaboration task "Experimental Training and Training Seminars" call University of L'Aquila "D.D.G. n. 893-2014 prot. n. 28288- 19.09.2014, published 22.09.2014) for n. 5 teaching collaborators (english language) for the Master Erasmus Mundus Mathmods students. (From 2/3/2015 to 28/3/2015 total 50 hours at DISIM Univeristy of L'Aquila)
- 3) Teaching collaboration task "Experimental Training and Training Seminars A" call University of L'Aquila "D.D.D. Rep n. 86 prot. n. 1867- 29 July 2015 for n. 8 teaching collaborators (english language) for mathematics international master degree courses. (From 10/3/2016 to 22/03/2016 total 25 hours at DISIM Univeristy of L'Aquila).
- 4) Teaching collaboration task "Experimental Training and Training Seminars B" call University of L'Aquila "D.D.D. Rep n. 86 prot. n. 1867- 29 July 2015 for n. 8 teaching collaborators (english language) for mathematics international master degree courses. (From 22/03/2016 to 20/04/2016 total 25 hours at DISIM Univeristy of L'Aquila).
- 5) Teaching collaboration task "Applied partial differential equations" call University of L'Aquila " D.D.D. rep. n.102 prot. n. 1712 - 14 June 2016 for n. 8 teaching collaborators (english language) for mathematics international master degree courses. (From 11/10/2016 to 12/01/2017 total 25 hours at DISIM Univeristy of L'Aquila at DISIM Univeristy of L'Aquila).
- 6) Teaching collaboration task "Experimental Training and Training Seminars B" call University of L'Aquila " D.D.D. rep. n.102 prot. n. 1712 del 14 June 2016 "for n. 8 teaching collaborators (english language) for mathematics international master degree courses. (From 28/02/2017 to 23/03/2017 total 25 hours at DISIM Univeristy of L'Aquila).
- 7) Teaching collaboration task "Experimental Training and Training Seminars C" call University of L'Aquila " D.D.D. rep. n.102 prot. n. 1712 ,14 June 2016 for n. 8 teaching collaborators (english language) for mathematics international master degree courses. (From 23/02/2017 to 1/06/2017 total 25 hours at DISIM Univeristy of L'Aquila).
- 8) Teaching collaboration task "Experimental Training and Training Seminars " call University of L'Aquila " D.D.D. rep. n. 133 prot. n. 2312 - 20 July 2017 for n. 4 teaching collaborators (english language) for mathematics international master degree courses. (From 06/10/2017 to 31/05/2018 total 100 hours at DISIM Univeristy of L'Aquila).
- 9) Teaching collaboration task "Experimental Training and Training Seminars " call University of L'Aquila " D.D.D. rep. n. 211 prot. n. 3051 del 5 september 2018 for n. 1 teaching collaborator (english language) for mathematics international master degree courses. (From 15/11/2018 to 9/5/2019 total 80 hours at DISIM Univeristy of L'Aquila).

Research activity

10) Teaching collaboration task “Experimental Training and Training Seminars” call University of L’Aquila “ D.D.D. rep. n. 206 prot. n. 2520 - 21 june 2019 for n. 1 teaching collaborator (english language) for mathematics international master degree courses. (From 1/10/2019 to 7/5/2020 total 80 hours at DISIM Univeristy of L’Aquila).

11) Teaching collaboration task “Parallel Computing Laboratory” call University of L’Aquila “ D.D.D. rep. n. 39 prot. n. 317 - 03 february 2021 for n. 9 teaching collaborators (english language) and for beginner students support and international students. (From 16/03/2021 to 25/05/2021 total 30 hours at DISIM Univeristy of L’Aquila).

12) Teaching collaboration task “Parallel Computing Laboratory” call University of L’Aquila “ D.D.D. rep. n. 200 prot. n. 1932 del 09 june 2021 for di n. 34 teaching collaborators (english language) and for beginner students support and international students. (From 17/03/2022 to 3/5/2022 total 30 hours at DISIM Univeristy of L’Aquila).

PhD thesis: “*Parallel numerical simulations of anisotropic and heterogeneous diffusion equations with GPGPU*” (2013) codice SBN: BVE0619213

Paper “*GPU software and architecture comparisons for numerical simulation of partial differential equations*” Jon. B. May , D. Pera Task Quarterly vol. 22, No 1 (2018) pp. 85-100 <https://doi.org/10.17466/tq2018/22.1/c>

Paper: “*Design and performance evaluation of a Linux HPC cluster*” D. Pera, Task Quarterly vol. 22, No. 2 (2018) pp. 113-123 <https://doi.org/10.17466/tq2018/22.2/b>

Paper : “*On the efficient numerical simulation of heterogenous anisotropic diffusion model for tumor invasion using GPUs*” D. Pera, C. Malaga, C. Simeoni, R. Plaza Rediconti di Matematica e delle sue Applicazioni Rend. Mat. Appl. (7) 40 (2019) 233-255.

Paper: R. D'Ambrosio, S. Di Giovacchino, D. Pera, “*Parallel Numerical Solution of a 2D Chemotaxis-Stokes System on GPUs Technology*”, in ICCS2020”, V. V. Krzhizhanovskaya et al. (Eds.), Lecture Notes in Computer Science 12137, [doi: 10.1007/978-3-030-50371-0_5](https://doi.org/10.1007/978-3-030-50371-0_5), Springer Nature Switzerland (2020).

Paper: “*GPU-based parallel simulations of the Gatenby-Gawliniski model with anisotropic, heterogeneous acid diffusion*” , C.Mascia, D. Pera, C. Simeoni [arXiv:2006.01748](https://arxiv.org/abs/2006.01748) (2020).

Paper: “On the possible use of the not-honoring method to include a real thrust into 3D physical based simulations,” F. Di Michele ,D. Pera , J.B. May, V. Kastelic M. M. C. Carafa , A. Styahar , B. Rubino , R. Aloisio , P. Marcati 2021 21st International Conference on Computational Science and Its Applications (ICCSA) 2021 268-275 DOI:[10.1109/ICCSA54496.2021.00044](https://doi.org/10.1109/ICCSA54496.2021.00044).

Paper: “Fast CUBIT-Python Tool for Highly Accurate Topography Generation and Layered Domain Reconstruction” J.May,D. Pera,F. Di Michele, R. Aloisio,B. Rubino, P. Marcati (2021, October 9). 29th International Meshing Roundtable (IMR), Virtual Conference. <https://doi.org/10.5281/zenodo.5559059>

Paper: “Spectral elements numerical simulation of the 2009 L’Aquila earthquake on a detailed reconstructed domain” F. Di Michele, J. May, D. Pera, V. Kastelic, M. Carafa, C. Smerzini, I.Mazzieri, B. Rubino, P. F. Antonietti, A. Quarteroni, R. Aloisio, P. Marcati, *Geophysical Journal International*, 2022;, ggac042, <https://doi.org/10.1093/gji/ggac042>.

Speaker at national and international congresses and conferences and seminars.

Paper: "Fault shape effect on SH waves using finite element method." Journal of Seismology Di Michele F., Styahar A., Pera D., May J., Aloisio R., Rubino B. Marcati P. (2022) 1-21. (<https://doi.org/10.1007/s10950-022-10075-y>).

Poster : "*Parallel numerical simulations of anisotropic and heterogeneous diffusion equations with GPGPU*" D. Pera, C Simeoni workshop "Perspectives of GPU computing on Physics and Astrophysics" 15-17 September 2014 at Sapienza University Rome.

Poster: "Numerical solution of elastodynamics equations using finite differences and dynamic calls on GPUs" J.B. May , D. Pera , F. Di Michele , P. Marcati, workshop PRACEday2018 29-31 Maggio 2018 at University of Ljubljana.

Poster: "*On the efficient numerical simulation of heterogeneous anisotropic diffusion models of tumor invasion using GPUs*" D. Pera, C. Malaga, C. Simeoni, R.G. Plaza, PUMPS+AI2018, Programming and Tuning Massively Parallel Systems+Artificial Intelligence Summer School Barcelona Supercomputing Center, Spain, July 16-20 2018.

Paper: Di Michele, F., Stagnini, E., Pera, D. *et al.* Comparison of machine learning tools for damage classification: the case of L'Aquila 2009 earthquake. *Nat Hazards* (2023). <https://doi.org/10.1007/s11069-023-05822-4>.

"*On the efficient numerical simulation of heterogeneous anisotropic diffusion models of tumor invasion using GPUs*" XIV Biennial Conference of the Italian Society of Applied and Industrial Mathematics Sapienza Università di Roma Faculty of Civil and Industrial Engineering Rome, July 5, 2018.

"*On the efficient numerical simulation of heterogeneous anisotropic diffusion models of tumor invasion using GPUs*" Workshop on front propagation methods and HPC simulation of biological systems- University of Cote D'Azur - Department of Mathematics and Polytech Nice Sophia- January 27th-30th 2020.

Poster presentation "*On the efficient numerical simulation of heterogeneous anisotropic diffusion models of tumor invasion using GPUs*" D. Pera, C. Malaga, C. Simeoni, R.G. Plaza, at PUMPS+AI2018, Programming and Tuning Massively Parallel Systems+Artificial Intelligence Summer School Barcelona Supercomputing Center, Spain, July 16-20 2018.

"*Speed-up and memory management for parallel numerical simulation of anisotropic diffusion equations with CUDA*", Seminar at IIMAS UNAM Mexico City June 2012.

"*Matematica e supercalcolatori*", OpenDay University of L'Aquila February 2013.

"*Matematica e supercalcolatori*", OpenDay University of L'Aquila April 2014.

Organization, direction and coordination of national and international research groups, or participation in them.	<p>Member of the international research projects Italy-Mexico: Analytical and numerical study of partial differential equations in the modeling of reaction and transport phenomena, characterized by the formation of complex structures , sponsored by Consejo Nacional de Ciencia y Tecnología (CONACyT Mexico) and the Italian Ministry of Foreign Affairs (MAE Program, Grant No.146529), 2011-2013.</p> <p>Technical support for scientific computing ERC project: Electronic Structure of Chemical, Biochemical, and Biophysical Systems Multiscale Approach with Electron Correlation Multiscale Bio, (Grant No.240624), June 2011 - September 2012 at University of L'Aquila.</p> <p>Member of reserach project: "Mathematical models for social innovations: vehicular and pedestrian traffic, opinion formation and seismology". University of L'Aquila year 2021.</p> <p>Member of the project High Performance Computing for disaster recovery (HPC4DR) University of L'Aquila (from 2021).</p>
Thesis supervision activities	<p>Co-supervisorfor the student C. Marinosci thesis title "<i>Un modello matematico per la crescita tumorale</i>" bachelor degree Biotechnology University of L'Aquila, A.A. 2013/2014.</p> <p>Co-supervisor for the student D. Prots thesis title "<i>Mathematical model for seismic wave propagation in heterogeneous media</i>" international master degree in mathematics University of Aquila, A.A. 2016/2017.</p> <p>Co-supervisor for the student S. Di Giovacchino thesis title "<i>Analysis of a Chemotaxis Navier Stokes system with a rotational flux term</i>" matser degree Ingegneria Mathematical Engineering University of L'Aquila, A.A. 2018/2019.</p>
Other teaching activities	<p>Teacher for the course "<i>Datacenter optimization techquiniques</i>" Istituto Zooprofilattico di Abruzzo e Molise , Teramo office (year 2015).</p>
Honours	<p>Civil protection bronze medal for public merit</p>
	<p>Autorizzo il trattamento dei miei dati personali ai sensi del</p>
	<p>I authorize the processing of my personal data according to "Decreto Legislativo 30 giugno 2003, n. 196 Codice in materia di protezione dei dati personali e successive modificazioni."</p>