Luca Cirrottola

Bordeaux, France
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Aerospace engineer and scientific computing programmer, with experience in numerical methods for computational fluid dynamics and multibody systems dynamics.

Appointments

11/2018 → **Post-doctoral research fellow**, *INRIA*, Bordeaux, *Parallel mesh adaptation*.
Development of the open source ParMMG library for parallel mesh adaptation (https://github.com/MmgTools/ParMmg) in the framework of the European research project ExaQUte.

07/2014 –10/2014 **Research Assistant**, *Politecnico di Milano - Department of Aerospace Science and Technology*, Milan, **Design of a twin engine helicopter with Twin Engine Pack System**.
Multibody modeling of a Twin Engine Pack System and preliminary design of a very light twin-piston driven helicopter, in collaboration with Robby Moto Engineering Srl and the Department of Mechanical Engineering of Politecnico di Milano.

Teaching

10/2019 –01/2020 **Teaching assistant**, *Bordeaux INP – ENSEIRB-MATMECA*, Bordeaux, **Mechanics of deformable solids**.
Guided exercises ("Travaux Dirigés") on continuum solid mechanics.

Education

Academic

11/2014 –10/2018 **Ph.D. in Aerospace Engineering**, *Politecnico di Milano - Department of Aerospace Science and Technology*, Milan, **Conservative interpolation-free mesh adaptation for three-dimensional aeroelastic simulations in unsteady compressible flows**.
Development and programming of adaptive grid methods for computational fluid dynamics on parallel computers into the Flowmesh solver (PoliMi) using the MMG remeshing library (INRIA–IMB). Development and programming of a reduced order finite element model for the simulation of the structural mechanics of a morphing wing.
Scholarship provided by the Ministry of Education, Universities and Research of the Italian Republic.

Visiting Ph.D. Student, *INRIA*, Bordeaux, **Computational fluid dynamics over r-adaptive grids** (11/2016 –12/2016, 02/2017 –06/2017).
Contribution to the software development of a C library for mesh adaptation with constant connectivity (r-adaptation) and application to compressible flow simulations. Software optimization and preliminary parallelization study for the linkage of a CFD solver with a parallel mesh adaptation library.

09/2011 –04/2014 **M.Sc. in Aeronautical Engineering, specialization in aerodynamics**, *Politecnico di Milano*, Milan, *110/110*.
Thesis *Optimal feedback control of plane channel flow over porous walls*, under the supervision of M. Quadrio and L. Cortelezzi.

09/2008 –09/2011 **B.Sc. in Aerospace Engineering**, *Politecnico di Milano*, Milan, *109/110*.

Short Courses

04 –08/11/2011 **Autumn school "High Performance Numerical Simulation"**, *Inria*, Talence.

15 –19/09/2014 **Uncertainty Quantification in Computational Fluid Dynamics**, *von Kármán Institute for Fluid Dynamics*, Rhode-Saint-Genèse.

02 –13/09/2013 **Summer School on Parallel Computing**, *CINECA*, Casalecchio di Reno (BO).

01 –07/07/2007 **51st University orientation courses**, *Scuola Normale Superiore di Pisa*, Cortona (AR).

Languages

Italian	Mother Tongue
English	Proficient
French	Proficient
German	Basic

English Language Certifications

2011 **Test of English for International Communication (TOEIC)**, *ETS*, Score 940/990 - Level C1.

2007 **First Certificate in English (FCE)**, *University of Cambridge ESOL Examinations*, Score B - Level B2.

Computer skills

Programming languages, libraries and tools	C, C++, Python, Fortran 2003, MPI, OpenMP, Git
Engineering software suites	Matlab, GNU Octave, Scilab, MBDyn, OpenFOAM
CAD systems	SolidWorks, Solid Edge, Inventor, Catia, Salome-Meca
Operating systems	Linux (Ubuntu, Debian), Windows (7, XP)

Miscellaneous

May 2012 – December 2012 **Student Aerodynamic Designer**, *Skyward Experimental Rocketry*, Milan.
Skyward Experimental Rocketry is a student association born at Politecnico di Milano to develop and produce experimental rocket prototypes. Together with master and bachelor degree students, I contributed to the design of the ogive and stabilization fins of the Rocksanne I-X rocket, and to the setup of the CFD analysis by means of opensource software.

Publications

Research reports

- L. Cirrottola, A. Froehly, *Parallel unstructured mesh adaptation using iterative remeshing and repartitioning*, INRIA Research Report 9307, November 2019.

Conference proceedings

- L. Cirrottola, A. Froehly, A. Guardone, G. Quaranta, B. Re, M. Ricchiuto, *R-adaptation for unsteady compressible flow simulations in three dimensions*,International Conference on Adaptive Modeling and Simulation (ADMOS), May 27-29, 2019, El Campello (Alicante), Spain.
- L. Cirrottola, G. Quaranta, B. Re, C. Dobrzynski, A. Guardone, *Numerical simulation of nonclassical aileron buzz over 3D unstructured adaptive meshes*, ECCOMAS ECCM-ECFD 2018, Glasgow, June 11-15, 2018.
- L. Cirrottola, M. Morandini, G. Quaranta, *Generalized beam models analysis for aeroelastic morphing applications*, ECCOMAS ECCM-ECFD 2018, Glasgow, June 11-15, 2018.
- L. Cirrottola, R. Alicino, G. Quaranta, R. Papetti, *Conceptual design of a piston driven light twin helicopter*, 5^{th} EASN Association International Workshop on Aerostructures, September 2-4, 2015, Manchester, United Kingdom.
- L. Cirrottola, M. Morandini, G. Quaranta, *A generalized beam formulation for the dynamic analysis of camber-morphing helicopter blades*, International Forum on Aeroelasticity and Structural Dynamics (IFASD), June 28-July 2, 2015, St. Petersburg, Russia.
- R. Alicino, L. Cirrottola, G. Quaranta, A. Albertoni, M. Massera, R. Papetti, *Twin Engine Pack System: A twin piston engine propulsion unit for Very Light Rotorcraft*, AHS International's 71st Annual Forum and Technology Display, May 5-7, 2015, Virginia Beach, Virginia, USA.

Submitted journal papers

- L. Cirrottola, M. Ricchiuto, A. Froehly, B. Re, A. Guardone, G. Quaranta, *Adaptive deformation of 3D unstructured meshes with curved body fitted boundaries with application to unsteady compressible flows*.