Luca Cirrottola

Bordeaux, France
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Aerospace engineer and scientific computing programmer, with experience in numerical methods for computational mechanics.

Experience

11/2018 –10/2020, 05/2021 –04/2022 **Post-doctoral research fellow/Research engineer**, *INRIA*, Bordeaux, France, *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.

11/2020 –04/2021 **Research engineer**, *INRIA*, Bordeaux, France, *Mmg platform*.
Development and support on the Mmg software platform (https://www.mmgtools.org).

09/2018 –10/2018 **Research assistant**, *INRIA*, Bordeaux, France, *Parallel mesh adaptation*.

07/2014 –10/2014 11/2014 –05/2015 **Research assistant**, *Politecnico di Milano - Department of Aerospace Science and Technology*, Milan, Italy, *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, France, **Mechanics of deformable solids I**.
Guided exercises ("Travaux Dirigés") on continuum solid mechanics.

Education

Academic

11/2014 –10/2017 (Defended 10/2018) **Ph.D. in Aerospace Engineering**, *Politecnico di Milano - Department of Aerospace Science and Technology*, Milan, Italy, **Conservative interpolation-free mesh adaptation for three-dimensional aeroelastic simulations in unsteady compressible flows**, under the supervision of G. Quaranta and B. Re.
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.
Three-year scholarship provided by the Ministry of Education, Universities and Research of the Italian Republic.

Visiting Ph.D. Student, *INRIA*, Bordeaux, France, **Computational fluid dynamics over r-adaptive grids** (11/2016 –12/2016, 02/2017 –06/2017), under the supervision of C. Dobrzynski and M. Ricchiuto.
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, Italy, *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 Trainings

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

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

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

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

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	Fortran 2003, C, C++, Python, MPI, OpenMP
Software version control, testing	Git, Jenkins

Publications

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*, Journal of Computational Physics, Vol. 433, 15 May 2021.

Conference proceedings

- L. Cirrottola, A. Froehly, *Parallel unstructured mesh adaptation based on iterative remeshing and repartitioning*, WCCM-ECCOMAS 2020, Paris (Virtual), January 11-15, 2021.
- 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.

Research reports

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