Alejandro Cosimo

Nationality: Argentinian/Italian; Born on Aug 19, 1985
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https://alecosimo.github.io/profile/

Background

Software Engineer with a PhD. in Computational Mechanics. Really passionate for the development and implementation of numerical methods targeting the simulation of physical systems. **Skills:** simulation, nonsmooth flexible multibody dynamics, FEM, Software Engineering, C/C++, python, object oriented programming, multithreaded programming, HPC, work on large FE code, Continuous Integration, version control system (git).

Education

PhD. in Engineering in the field of Computational Mechanics; GPA: 9.37/10. *National University of the Littoral*, Santa Fe, Argentina. (26/07/2010 – 17/11/2014)

Software Engineer: five-years professional degree; GPA: 9.03/10. *National University of the Littoral*, Santa Fe, Argentina. (01/03/2004 – 19/09/2009)

Professional experience

10/2018 - Present **Research Engineer** at the University of Liège.

12/2016 - 10/2018 **Assistant Researcher** at the National Scientific and Technical Research Council (CONICET) of Argentina. Currently on research leave.

04/2011 - 10/2018 **Teaching Assistant** at the National University of the Littoral. Currently on research leave.

July 2016 **Short research stay** at the International Center for Numerical Methods in Engineering, Technical University of Catalonia (UPC).

05/2015 - 05/2016 **Postdoctoral Researcher** at the Institute of Applied Mechanics, Technische Universität München (TUM University Foundation Fellowship).

10/2015 - 04/2016 **Ad-honorem Co-Lecturer** at the Institute of Applied Mechanics, Technische Universität München. Winter Semester (WiSe) 2015/2016.

04/2010 - 04/2015 **Doctoral Fellow** at the Research Center for Computational Methods (CIMEC) funded by the Nuclear Regulatory Authority of Argentina.

Skills in detail

- **Programming:** C/C++, python and Matlab. Continuous Integration. **Revision control:** git. **Build tool:** cmake
- **Coding projects:** ***Odin:*** a multibody dynamics code based on the Lie group formalism. ***Oofelie:*** a large finite element/multibody dynamics code. ***Eins:*** a FETI library implemented as PETSc extensions.
- Multithreaded programming. **HPC standards:** MPI and OpenMP. **Math libraries:** PETSc, Eigen, Lapack and MKL-Pardiso
- **Operating Systems:** Linux and Windows
- Nonsmooth Flexible Multibody Dynamics. Lie group methods. Physical modelling in general. The Finite Element Method
- Robotic technology: Robot Operating System (ROS), Gazebo and MoveIt.
- Model Reduction Strategies for linear and highly non-linear problems
- Domain Decomposition techniques, such as Finite Element Tearing and Interconnect (FETI) methods
- The Thermo-Mechano-Metallurgical modelling of welding and additive manufacturing
- **Languages**. *Spanish:* mother tongue. *English*: UNICert Level C1 (DAAD Certificate)

Awards and honors

2010 Recognition of Academic Achievement. National University of the Littoral (granted by RedSport).

2010 Honor Diploma to one of the best averages of the Santa Fe Province in 2009. Awarded by revista Punto Biz, Fundación Banco Municipal de Rosario and SESA Select.

2010 Honor Diploma to the best average of 2009 in Software Engineering, National University of the Littoral. Granted by the Colegio de Ingenieros Especialistas, Santa Fe, Argentina.

Selected publications

On the adaptation of local impact laws for multiple impact problems. A. Cosimo, F. Cavalieri, A. Cardona and O. Brüls. *Nonlinear Dynamics* (2020).

A robust nonsmooth generalized-α scheme for flexible systems with impacts. A. Cosimo, J. Galvez, F. Cavalieri, A. Cardona and O. Brüls. *Multibody System Dynamics* (2019).

Parallel distributed computing using Python. L. Dalcin, R. Paz, P. Kler and A. Cosimo. *Advances in Water Resources* (2011).

Publications in preparation

Towards a mortar formulation for frictionless contact between beams with circular cross-sections: a mortar formulation for line-line contact of beams is proposed.

About the nonsmooth generalized-α method (NSGA) and contact constraints at acceleration level: contact constraints at acceleration level are studied in the context of the NSGA.

Extended version of my CV

For an extended version of my CV go to my LinkedIn: : alejandro-cosimo