Alejandro Cosimo

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Background

I'm a Software Engineer with a PhD. in Computational Mechanics. The strongest asset that I have to offer is the passion for the things I do. I feel really passionate for the development and implementation of numerical methods targeting the simulation of physical systems.

Education

2010 – 2014 **Doctor in Engineering** in the field of Computational Mechanics; GPA: 9.37/10. *National University of the Littoral*, Santa Fe, Argentina. (Jul 2010 – Nov 2014)

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

Professional experience

Present **Research Engineer** at the University of Liège. Since Oct 1, 2018.

Research Leave **Assistant Researcher** at the National Scientific and Technical Research Council (CONICET) of Argentina. Since Dec 1, 2016. Currently on research leave.

Research Leave **Teaching Assistant** at the University of the Littoral. Since Apr 1, 2011. Currently on research leave.

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

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

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

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

Skills

- **Programming:** C/C++ and python. **Revision control:** git. **Build tool:** cmake
- **HPC standards:** MPI and OpenMP. **Math libraries:** PETSc, Eigen, Lapack and MKL
- **Operating Systems:** Linux and Windows
- Nonsmooth Multibody Dynamics. The Finite Element Method
- Model Reduction Strategies for linear and highly non-linear problems
- **Languages**. *Spanish:* mother tongue. *English*: UNICert Level C1 (DAAD Certificate)

Selected publications

Global-Local HROM for non-linear thermal problems with irreversible changes of material states. A. Cosimo, A. Cardona and S. Idelsohn. *Comptes Rendus Mécanique* (2018).

Improving the k-compressibility of Hyper Reduced Order Models with moving sources: Applications to welding and phase change problems. A. Cosimo, A. Cardona and S. Idelsohn. *Computer Methods in Applied Mechanics and Engineering* (2014).

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

Publications in preparation

Simulation of multi-impact collisions in Nonsmooth Contact Dynamics: a general methodology for handling simultaneous multi-impact collisions is proposed.

Nonsmooth numerical solution of frictional contact problems in multibody system dynamics: the nonsmooth generalized-α scheme is extended to problems involving friction.

Robust nonsmooth generalized-α scheme for problems with flexible components, bilateral constraints and impacts: a decoupled formulation of the nonsmooth generalized-α scheme is proposed.