# David Moro

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# EDUCATION

PhD in Aerospace Engineering at MIT, USA

- Thesis title: An adaptive high order Reynolds-averaged Navier-Stokes solver with transition prediction. Thesis supervisors: J. Peraire, N.C. Nguyen and M. Drela.
- Major: Computational engineering
- Minor: Operations research for transportation
- Relevant coursework: Numerical analysis, Numerical methods for PDEs, Numerical linear algebra, Fluid Mechanics, Optimization, Operations Research for Air Transportation, Logistics and transportation planning. **GPA: 4.9/5.0**.

MSc in Aerospace Engineering at *MIT*, USA 2009-2011

Aeronautical Engineer (5 year Degree) at Polytechnic Univ., Madrid, Spain 2002-2007

## RELEVANT EXPERIENCE

## Teaching assistant at *MITx*

- Principal TA for the online graduate level course 16.110X: Flight Vehicle Aerodynamics under supervision of Prof. Mark Drela.
- Beta-tested content and coordinated online forum discussion for **1000+ students**. Met regularly with the MITx technical staff to asses the evolution of the course and took a proactive role in proposing enhancements to the platform.

## **Program Manager** at SEADM

- Led an R&D team of 8 engineers and scientists that developed an explosive detection device (ACES System) based on a coupled ESI-DMA-MS instrument.
- Managed relations with the funding entities (European Union FP7 Program, Spanish Ministry of Defense, Shimadzu Research Laboratory Ltd., SAGEM Sécurité).
- A full scale prototype was tested in airport environment showing sensitivities **below a partper-quatrillion (ppq) to explosive volatiles**. The system is nowadays in the **last stages of certification** before commercialization.

### Research and Development Engineer at SEADM

- Analyzed, designed and tested the coupling between an Electrospray ionization source (ESI), a mobility analyzer (DMA) and a mass spectrometer (MS) for **explosive detection** purposes.
- Proposed a solution that tripled the resolution of the detector while retaining ion transmission in the order of 50%.
- Visited Yale University as a Visiting Assistant in Research (VAR) during this project.

### Research assistant at Polytechnic University of Madrid

- Verified and validated a transonic aeroelastic code for EADS-CASA.
- The code entered the **software suite of aerodynamic analysis** of EADS-CASA.

### 2008-2009

### 2006-2007

2007-2008

2011 - 2014

Spring 2014

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## SELECTED PUBLICATIONS

Moro D, Nguyen N.C., Peraire J. A hybridized discontinuous Petrov-Galerkin scheme for scalar conservation laws. *International Journal for Numerical Methods in Engineering*, 91(9):950-970 (2012).

Rus J, **Moro D**, Sillero J. A., Royuela J, Casado A, Estévez-Molinero F, and Fernández de la Mora J. IMS-MS Studies Based on Coupling a Differential Mobility Analyzer (DMA) to Commercial API-MS Systems. *International Journal of Mass Spectrometry*, 298:30-40 (2010).

**Moro D**, Nguyen N.C., Peraire J. A dilation based artificial viscosity model for high order methods on unstructured grids, *in preparation*.

**Moro D**, Nguyen N.C., Drela M., Peraire J. On the fly boundary layer adaptivity on hybrid meshes, *in preparation*.

**Moro D**, Nguyen N.C., Peraire J., Drela M. Strong monolithic coupling of a RANS solver and the  $e^N$  method, *in preparation*.

10 talks and 2 posters in international conferences and symposia.

# SKILLS

- Language:
  - Bilingual in English and Spanish
  - Intermediate level in French
- Computer:
  - Languages: Fortran 77/90, Python
  - Mathematical software: Matlab & Simulink, CPLEX
  - Solid modeling: Solidedge, Alibre design
  - Aerodynamic design: **XFOIL**, AVL
  - Project management: Microsoft Project (user level)
  - Other:  ${\rm \sc LAT}_{\rm \sc E}{\rm \sc X},$  Linux, HTML and Git

# HONORS/AWARDS

• MIT Zakhartchenko Fellowship	2013 - 2014
• Fundación La Caixa Scholarship for graduate studies in the United States	2011-2013
• Fundación CajaMadrid Scholarship for graduate studies abroad	2009-2011
• AIRBUS Prize to excellence in major (Aircraft Design)	Sept 2007
• 2nd Prize Francisco Arranz by the Spanish Society of Aeronautical Engineers	Sept 2007
• Spanish Ministry of Education Scholarship for undergraduate studies	2003-2007
• State of Madrid Scholarship for academic excellence	2002-2003