

CV Manuel Soler Arnedo

B.S. Aerospace Engineering
M.S. Aerospace Science
Ph.D. Aerospace Engineering

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Department of Signal Theory and Communications
Aerospace Engineering Area
Lecturer and Researcher

Education

- 2013 **PhD**, *Doctor of Philosophy in Aerospace Engineering*.
Universidad Rey Juan Carlos
Dissertation: Commercial Aircraft Trajectory Planning based on Multiphase Mixed-Integer Optimal Control.
- August 2012-December 2102. PhD visiting scholar in NEXTOR (National Center of Excellence for Aviation Operations Research) at the University of California at Berkeley (UCB).
 - May 2010- August 2010. PhD visiting scholar in the automatic control laboratory at the Swiss Federal Institut of Technologie (ETH).
- 2011 **MSc**, *Master of Science in Aerospace Science and Technology*.
School of Aerospace Engineering at Polytechnic University of Madrid.
Dissertation: *trajectory planning via hybrid optimal control*.
- 2007 **BSc & MSc**, *Bachelor of Science in Aeronautics & Aerospace Engineering*, *Master of Science in Airport Design and Planning*.
School of Aerospace Engineering at Polytechnic University of Madrid.
- March 2007-October 2007; exchange at TU Berlin. Masters Final Project Work. Institut fuer Luft und Raumfahrt at the Technischen Universitaet Berlin. Dissertation: *Managing Airports: an application to Berlin Brandenburg International airport*.
- **BSc**, *Bachelor in Business & Management*.
Faculty of Economics at UNED.
Currently studying third year

Job experience

- 2013- **Rey Juan Carlos University**, *Lecturer and researcher*.
- 2008-2013 **Rey Juan Carlos University**, *PhD student, teaching assistant and researcher*.
- 2007-2008 **INECO: General Direction of Airports and Air transportation**, *technical consultant in airport design and planning*.
- 2006 **AENA (Spanish Airports and Air Navigation): Business & Management Direction**, *internship*.

Publications

Books

- 2013 **M. Soler**, *Commercial Aircraft Trajectory Planning based on Multiphase Mixed-Integer Optimal Control*, OMM Editorial, ISBN 978-84-941248-1-5.

Journal papers

- 2013 **P. Bonami, A. Olivares, M. Soler, and E. Staffetti**, *Multiphase Mixed-Integer Optimal Control Approach to Aircraft Trajectory Optimization*, Journal of Guidance, Control, and Dynamics, Accepted for publication.
- 2012 **M. Soler, A. Olivares, E. Staffetti, and D. Zapata**, *Framework for Aircraft 4D Trajectory Planning Towards an Efficient Air Traffic Management*, Journal of Aircraft, Vol. 49, No. 1, January-February 2012. DOI: 10.2514/1.C031490.
- 2010 **M. Soler, A. Olivares, and E. Staffetti**, *Hybrid Optimal Control Approach to Commercial Aircraft Trajectory Planning*, Journal of Guidance, Control, and Dynamics, Vol. 33, No. 3, May-June 2010. DOI: 10.2514/1.47458.

Peer-reviewed conference papers

- 2013 **M. Soler, B. Zou, and M. Hansen**, *Contrail Sensitive 4D Trajectory Planning with Flight Level Allocation using Multiphase Mixed-Integer Optimal Control*, Proceedings of the AIAA Guidance, Navigation, and Control Conference, August 19-22, 2013. Boston, USA. Accepted.
- 2013 **A. Olivares, M. Soler, and E. Staffetti**, *Multiphase Mixed-Integer Optimal Control applied to 4D Trajectory Planning in Air Traffic Management*, Proceedings of AT-ACCS'13, HALA research network conference, May 28-30, 2013. Naples, Italy. ISBN: 978-2-917490-24-2, pp 104-114. **Best Research Paper Award.**
- 2012 **M. Soler, M. Kamgarpour, C. J. Tomlin, and E. Staffetti.**, *Multiphase Mixed-Integer Optimal Control Framework for Aircraft Conflict Avoidance.*, 51st IEEE Conference on Decision and Control (CDC 2012), December 8-11 2012, Maui, Hawaii, USA. pp 1740-1745.
- 2011 **M. Kamgarpour, M. Soler, C. J. Tomlin, A. Olivares, and J. Lygeros.**, *Hybrid Optimal Control for Aircraft Trajectory Design with a Variable Sequence of Modes*, Proceedings of the 18th IFAC World Congress, Vol 18, part I, August 29-31 2011. Milan, Italy. ISBN: 978-3-902661-93-7.
- 2011 **M. Soler, A. Olivares, E. Staffetti, and P. Bonami**, *En-Route Optimal Flight Planning Constrained to Pass Through Waypoints using MINLP*, Proceedings of the 9th ATM Seminar, June 14-17 2011. Berlin, Germany.
- 2011 **M. Soler, A. Olivares, E. Staffetti, and J. Cegarra**, *Optimal 4D Strategic Trajectory Planning in ATM*, Proceedings of ATACCS'11, HALA research network conference, May 26-27, 2011. Barcelona, Spain. ISBN: 978-2-917490-14-3.
- 2010 **M. Soler, A. Olivares, E. Staffetti, D. Zapata and J. Cegarra**, *Comparative Analysis of Commercial Aircraft Trajectory Performance.*, Proceedings of the 2nd International Conference on Engineering Optimization (EngOpt), September 6-9 2011. Lisbon, Portugal. ISBN: 978-989-96264-3-0.

- 2010 **M. Soler, A. Olivares and E. Staffetti**, *Hybrid Optimal Control Approach to Commercial Aircraft 3D Multiphase Trajectory Optimization*, Proceedings of the AIAA Guidance, Navigation, and Control Conference, August 2-5, 2010. Toronto, Canada. AIAA-2010-8453.

Research

Research projects

- 2011-2012 **Parametric Optimization software package for TRAjectory shaping under constraints, POTRA**, *Clean Sky Joint Technology Initiative project*, financed by the European Union's Seventh Framework Program (FP7/2007-2013).
- 2008-2011 **Application of Leading Technologies to Unmanned Aerial Vehicles for Research and Development in ATM, ATLANTIDA**, *CENIT project*, financed by the spanish government and leded by Boeing R&D.
- 2009-2010 **Optimization models in Air Traffic Management: Strategic Planning**, *Consolider project Ingenio Mathematica*, financed by the spanish government.

Research networks

- **HALA! (Higher Automation Levels in ATM)**. HALA! is a Research Network established within the framework of SESAR WP-E to spearhead long term and innovative research in automation in ATM in pursuit of the SESAR 2020 vision and beyond
- **ComplexWorld** is a Research Network established within the framework of SESAR WP-E, bringing together researchers from academia, research establishments and industry that share common interests and expertise in the field of ATM Complexity Management.

Teaching Activity

Courses

- 2012-2013 **Air Navigation**, *Degree in Aerospace Engineering in Air Navigation*, Universidad Rey Juan Carlos, Lecturer (English).
Second year, second semester
- 2012-2013 **Ingeniería Aeroespacial**, *Grado en Ingeniería Aeroespacial en Aeronavegación*, Universidad Rey Juan Carlos, Profesor responsable (Español).
Curso primero, segundo semestre
- 2011-2012 **Aerospace Engineering**, *Degree in Aerospace Engineering in Air Navigation*, Universidad Rey Juan Carlos, Lecturer (English).
First year, second semester

Published Material

- 2012-2013 **Course on Aerospace Engineering**, *Lecture Notes*, Digital Version. 2nd Edition.
- 2012-2013 **Course on Aerospace Engineering**, *Collection of exams with solutions*, Digital Version. 1st Edition.
- 2012-2013 **Air Navigation**, *Slides*, Digital Version. 1st Edition.

Other courses as assistant

- 2010-2011 **Estadística**, *Grado en ingeniería del software*, Universidad Rey Juan Carlos, Ayudante (Español).
Curso primero, segundo semestre
- 2010-2011 **Estadística**, *Licenciatura en periodismo*, Universidad Rey Juan Carlos, Ayudante (Español).
Curso tercero, primer semestre
- 2009-2010 **Estadística**, *Ingeniería informática*, Universidad Rey Juan Carlos, Ayudante (Español).
Curso segundo, primer semestre
- 2009-2010 **Estadística**, *Licenciatura en periodismo*, Universidad Rey Juan Carlos, Ayudante (Español).
Curso tercero, primer semestre
- 2008-2009 **Estadística**, *Ingeniería de Telecomunicaciones*, Universidad Rey Juan Carlos, Ayudante (Español).
Curso primero, segundo semestre

Languages

Spanish

- **Mother language.**

English

- **Highly skilled (Level C2).** Lived in USA for 10 months. Attended several courses. Título superior de la Escuela Oficial de Idiomas. 102 Toefl IBT. High proficiency in written and spoken english. Used to give oral presentations and write scientific documents.

German

- **Skilled (Level B2)** Lived in Germany for 7 months and Switzerland for 3 months. Attended level A1.1 to A2.2 courses at Goethe Institut Madrid. Attended level B1 to B2 courses at TU Berlin. 4th year in the Escuela Oficial de Idiomas.

Italian

- **Basic Knowledge (Level A2)** Attended courses A1 and A2 at TU Berlin.