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July, 2002

Personal Information

Date of birth: May 17th, 1972
Place of birth: Porto, Portugal
Nationality: Portuguese
Martial status: Married
Current home address: 673 Partridge Avenue, Menlo Park, CA 94025, USA

Ph.D. Dissertation

Stanford University Stanford, CA
July 1997 – Present
"High-Fidelity Aero-Structural Design Optimization of Aircraft Configurations"
Advisor: Professor Juan J. Alonso
Co-advisor: Professor Ilan M. Kroo
Reader: Professor Antony Jameson
The research for this dissertation focuses on the development of new methods for computing multidisciplinary sensitivities and is applied to the aero-structural design of a supersonic business jet configuration.

Educational Background

Stanford University Stanford, CA
September 1996 – June 1997
Masters of Science in Aeronautics and Astronautics, GPA: 3.9/4.0. Course work with emphasis on Aircraft Design, Optimization and CFD.

Technion – Israel Institute of Technology Haifa, Israel
February 1995 – May 1995
Final Year Project: "Self-Similar Solutions for the Plane Turbulent Jet". This research consisted in using self-similarity to derive a set of partial differential equations. The equations were then solved numerically to obtain solutions for the plane turbulent free jet using three different turbulence models of increasing complexity.

Imperial College of Science, Technology and Medicine London, UK
September 1991 – May 1995
MEng Honours Aeronautical Engineering Graduated with First Class Honours. Ranked in top 5% of the class.

University of Oslo Oslo, Norway
August 1990 – May 1991
Undergraduate course in Mathematics.

Teaching Experience

Stanford University Stanford, CA
Teaching Assistant *Spring 2001*
Assisted Professor Ilan M. Kroo in teaching a new class entitled "AA222: Introduction to Multidisciplinary Optimization". Responsibilities included grading of homework, and holding office hours and review sessions. Taught two lectures on the topic of *sensitivity analysis*, wrote a relevant problem set, and final exam questions.

Relevant Graduate-Level Courses

Advanced CFD	Antony Jameson
Aircraft Design I & II	Ilan M. Kroo
Computational Fluid Dynamics I	Thomas H. Pulliam
Computational Fluid Dynamics II & III	Robert W. MacCormack
Current Topics in Aerodynamic Design	Ilan M. Kroo
C++ and Object-Oriented Programming	Andy Maag
Control Design Techniques	Stephen M. Rock
Fluid Dynamics	M. Godfrey Mungal
Mechanics of Composite Materials	George S. Springer
Optimization	Richard W. Cottle
Practical Optimization	Walter Murray
Rotorcraft Aerodynamics	Yung Yu
Structural Dynamics	Holt Ashley

Professional Experience

Serviços de Engenharia, S.A. Macao
CAD Engineer *Summer 1993*
Worked on various electrical engineering related projects.

Union Bay Shipbuilding Corporation Seattle, WA
Assistant Engineer *Summer 1992*
Engineering work included extensive use of AutoCAD, responsible for editing drawings ready for CAM.

Academic Awards

Praxis XXI Scholarship, September 1997

Norwegian Fulbright Stipend, September 1996

British Aerospace Award, May 1995

Publications

Refereed Journal Publications

J.R.R.A.Martins, J.J.Alonso and J.Reuther, "Aero-Structural Wing Design Optimization Using High-Fidelity Sensitivity Analysis", *Journal of Aircraft Design* (accepted for publication by Dr. Jan Roskam in September 2001, but journal ceased publication shortly after that).

J.R.R.A.Martins, P.Sturdza and J.J.Alonso,"The Complex-Step Derivative Approximation", *ACM Transactions on Mathematical Software*, (accepted for publication, August 2002).

J.R.R.A.Martins, J.J.Alonso and J.Reuther, "High-Fidelity Aero-Structural Design Optimization of a Supersonic Business Jet", *AIAA Journal of Aircraft* (submitted for publication , July 2002).

J.R.R.A.Martins, J.J.Alonso and J.Reuther, "An Efficient Coupled-Adjoint Sensitivity Analysis Method for High-Fidelity Aero-Structural Systems", *Optimization and Engineering* (invited for publication in a special issue on MDO).

Refereed Conference Proceedings

P.Peterson, J.R.R.A.Martins and J.J.Alonso, "Fortran to Python Interface Generator with an Application to Aerospace Engineering", *Proceedings of the 9th International Python Conference*, Long Beach, CA, March 2001.

Other Conference Proceedings (reviewed abstracts)

J.R.R.A.Martins, J.J.Alonso and J.Reuther, "High-Fidelity Aero-Structural Design Optimization of a Supersonic Business Jet", *Proceedings — AIAA Structures, Structural Dynamics, and Materials Conference*, Denver, CO, April 2002. AIAA Paper 2002-1483.

J.R.R.A.Martins, J.J.Alonso and J.Reuther, "Aero-Structural Wing Design Optimization Using High-Fidelity Sensitivity Analysis", *Proceedings — CEAS Conference on Multidisciplinary Aircraft Design Optimization*, Cologne, Germany, June 2001.

J.R.R.A.Martins, P.Sturdza and J.J.Alonso, "The Connection Between the Complex-Step Derivative Approximation and Algorithmic Differentiation", *Proceedings of the 39th Aerospace Sciences Meeting*, Reno, NV, January 2001. AIAA Paper 2001-0921.

J.R.R.A.Martins, I.M.Kroo and J.J.Alonso, "An Automated Method for Sensitivity Analysis Using Complex Variables", *Proceedings of the 38th Aerospace Sciences Meeting*, Reno, NV, January 2000. AIAA Paper 2000-0689.

J.J.Reuther, J.J.Alonso, J.R.R.A.Martins and S.C.Smith, "A Coupled Aero-Structural Optimization Method for Complete Aircraft Configurations", *Proceedings of the 37th Aerospace Sciences Meeting*, Reno, NV, January 1999. AIAA Paper 99-0187.

Unpublished Technical Reports

J.R.R.A.Martins, "Self-Similar Solutions for the Plane Turbulent Jet", TAE no. 750, Faculty of Aerospace Engineering, Technion – ITT, Haifa, June 1995.

J.R.R.A.Martins, "Front Fuselage Structure of an Advanced Air Superiority Fighter", Department of Aeronautics, Imperial College, London, May 1994.

Scholarly Presentations

Conference Presentations

"High-Fidelity Aero-Structural Design Optimization of a Supersonic Business Jet", *AIAA Structures, Structural Dynamics, and Materials Conference*, Denver, CO, April 2002

"Aero-Structural Wing Design Optimization Using High-Fidelity Sensitivity Analysis" *CEAS Conference on Multidisciplinary Aircraft Design Optimization*, Cologne, Germany, June 2001.

"Fortran to Python Interface Generator with an Application to Aerospace Engineering", *9th International Python Conference*, Long Beach, CA, March 2001.

"The Connection Between the Complex-Step Derivative Approximation and Algorithmic Differentiation", *39th Aerospace Sciences Meeting*, Reno, NV, January 2001

"An Automated Method for Sensitivity Analysis Using Complex Variables", *38th Aerospace Sciences Meeting*, Reno, NV, January 2000.

Invited Presentations

"High-Fidelity Aero-Structural Design Optimization of Aircraft Configurations", University of Toronto Institute for Aerospace Studies, Toronto, May 2002.

"The Complex-Step Derivative Approximation", *Sensitivity Analysis Workshop*, Lawrence Livermore National Laboratory, Livermore, CA, August 2001.

"The Complex-Step Derivative Approximation", Sandia National Laboratories, Albuquerque, NM, March 2001.

Computing Skills

Programming Languages: Python, Fortran 90/77, C/C++ and Matlab.

Operating Systems: Linux (including system administration), UNIX, and Windows.

Languages

Native Portuguese speaker, fluent Norwegian and conversational French.

Other Interests and Activities

Sports: Enjoys mountain biking, avid swimmer. Photography: Photographer for the Stanford Daily; assignments included Women's World Cup semi-final game. Advertisement photography for National Geographic Television, Azores, Summer 1996. Exhibition entitled *Mato Grosso — Into the Amazon*, sponsored by the local government, Azores, July 1996.