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Female, Portuguese, born on April 21, 1956.

Research Areas: Numerical Analysis, Wavelet Analysis and Applications to Economics

EDUCATION

- **Ph. D in Mathematics**
Brunel University, U.K. 1986
Dissertation title: A Posteriori Corrections for Cubic and Quintic Interpolating Splines with Applications to the Solution of Two-Point Boundary Value Problems
- **M. Sc. in Numerical Analysis**
Brunel University, U.K. 1983
Dissertation title: Two Classes of Interpolatory Piecewise Polynomials
- **B.Sc. in Pure Mathematics**
University of Coimbra, Portugal 1978

PROFESSIONAL EXPERIENCE

- **Associate Professor**, University of Minho 06/1991 – present
- **Auxiliary Professor**, University of Minho 01/1987 – 06/1991
- **Assistant**, University of Minho 10/1980 – 01/1987
- **Trainee Assistant**, University of Minho 10/1978 – 10/1980
- **Monitor**, University of Coimbra 10/1976 – 10/1978

ADMINISTRATIVE POSITIONS AT THE UNIVERSITY OF MINHO

- **Director of the Master** in Computational Mathematics 07/1998 – 05/2001
- **Head of the Mathematics Department** 10/1995 – 10/1997
- **Director of B. Sc. Course** in Teaching of Mathematics 10/ 1987 – 11/1990

PUBLICATIONS

Refereed journals

- **Carbon financial markets: a time-frequency analysis of CO₂ prices**, *Physica A : Statistical Mechanics and its Applications* (forthcoming) (joint with L. Aguiar-Conraria and R. Sousa)
- **The continuous wavelet transform: moving beyond uni and bivariate analysis**, *Journal of Economic Surveys*, **28**(2), 344-375, 2014 (joint with L. Aguiar-Conraria)
- **The nationalization of electoral cycles in the United States: a wavelet analysis**, *Public Choice*, **156**(3-4), 387-408, 2013 (joint with L. Aguiar-Conraria and P. Magalhães)
- **Convergence of the economic sentiment cycles in the eurozone: a time-frequency analysis**, *Journal of Common Market Studies*, **51**(3), 377-398, 2013 (joint with L. Aguiar-Conraria and M. M. F. Martins)

- **Cycles in Politics: wavelet analysis of political time-series**, *The American Journal of Political Science*, **56**(2), 500-518, 2012 (joint with L. Aguiar-Conraria and P. Magalhães)
- **The yield curve and the macro-economy across time and frequencies**, *Journal of Economic Dynamics & Control*, **36**(12), 1950-1970, 2012 (joint with L. Aguiar-Conraria and M. M. F. Martins)
- **Business cycle synchronization and the Euro: a wavelet analysis**, *Journal of Macroeconomics*, **33**(3), 477-489, 2011 (joint with L. Aguiar-Conraria)
- **Oil and the Macroeconomy: using wavelets to analyze old issues**, *Empirical Economics*, **40**(3), 645-655, 2011 (joint with L. Aguiar-Conraria)
- **Using wavelets to decompose the time-frequency effects of monetary policy**, *Physica A: Statistical Mechanics and its Applications*, **387** (12), 2863-2878, 2008 (joint with L. Aguiar-Conraria and N. Azevedo)
- **A regularization of nonlinear diffusion equations in a multiresolution framework**, *Math. Meth. Appl. Sci.*, **31**, 576-587, 2008 (joint with G. Teschke and M. Zhariy)
- **A numerical method for the computation of Faber polynomials for starlike domains**, *J. Numer. Anal.*, **13**, 181-193, 1993 (joint with N. Papamichael and N. Stylianopoulos)
- **An $O(h^6)$ cubic spline interpolation procedure for harmonic functions**, *Num. Meth. PDE's*, **7**, 43-59, 1991 (joint with N. Papamichael)
- **Cubic and quintic spline-on-spline interpolation**, *J. Comp. Appl. Math.*, **20**, 359-366, 1987 (joint with N. Papamichael)
- **A posteriori corrections for non-periodic cubic and quintic interpolating splines at equally spaced knots**, *IMA J. Numer. Anal.*, **6**, 489-582, 1986 (joint with N. Papamichael)

Conference proceedings

- **Homogeneous Dynamics for Square Boolean Automata with Null Boundary Conditions**, B. Murgante et. al (Eds), ICCSA 2014, Part I, LNCS 8579, 30-43, 2014 (joint with R. Severino and M. E. Athayde)
- **Inflation rate dynamics convergence within the Euro**, B. Murgante et. al (Eds), ICCSA 2014, Part I, LNCS 8579, 132-145, 2014 (joint L. Aguiar-Conraria)
- **A wavelet based numerical method for nonlinear partial differential equations**, *IKM Conference*, Weimar, 2003 (electronic publication) (joint with S. Dahlke, M. Lindemann, G. Teschke, M. Zhariy, P. Cerejeiras and U. Kahler)
- **Transforms, Algorithms and Applications**, Proc. Conference *Mathematical Techniques and Problems in Telecommunications*, Tomar, September 2003.
- **Wavelets and Multiresolution Analysis** (in portuguese), Proc. *Mathematics for Telecommunications - What Problems?*, Coimbra, September 1998.
- **Wavelets and Signal Processing** (in portuguese), Proc. *First National Conference on Telecommunications*, Aveiro, April 1997.

Book chapters

- **Oil Shocks and the Euro as an Optimum Currency Area**, in *Wavelet Applications in Economics and Finance: essay in honor of James B. Ramsey*, Ed. Marco Gallegati, Springer (forthcoming) (joint with L. Aguiar-Conraria and T. M. Rodrigues)
- **Extrapolated Collocation Methods for Two-Point Boundary Value Problems**, in *Numerical Approximation of Partial Differential Equations*, Ed. E. L. Ortiz, North-Holland, Amsterdam, 1987.

Other publications

- **Wavelets and Economics**, *Bulletin of the International Center for Mathematics*, July 2011, 10 – 18 (joint with L.-Aguiar Conraria.)

ORGANIZATION OF SCIENTIFIC MEETINGS

- **VI Workshop of Numerical Analysis of Free Boundary Problems**, Braga, 14-16 November 1998
- **Mathematics for Telecommunications- What problems?**, Coimbra, September 1998
- **Meeting of the Portuguese Mathematical Society**, Braga, February 1998.
- **Wavelets and Their Applications**, University of Madeira, August 1994.
- **XII Portuguese-Spanish Mathematical Meetings**, University of Minho, May 1987.

SHORT COURSES

- **Introduction to Wavelet Theory**, Summer School of the Portuguese Mathematical Society, Aveiro, September 1997.
- **Introduction to Wavelet Theory**, Polytechnic Institute of Porto, April 1999.

HONORS AND AWARDS

- **Best Researcher of the School of Business and Economics of the University of Minho:** Award given in 2013 for the paper “Cycles in Politics: Wavelet Analysis of Political Time-Series”, published in *The American Journal of Political Science*.
- **Doutor João Farinha Award (University of Coimbra)** for the student finishing a BSc in Mathematics with the highest GPA.
- **JNICT**, doctoral scholarship, 1983-1986.

SKILLS

- **Languages:** Native Portuguese, Fluent English, French.
- **IT:** Mathematical Software such as Fortran, Mathematica, MATLAB.