Professor Alberto Pirrera

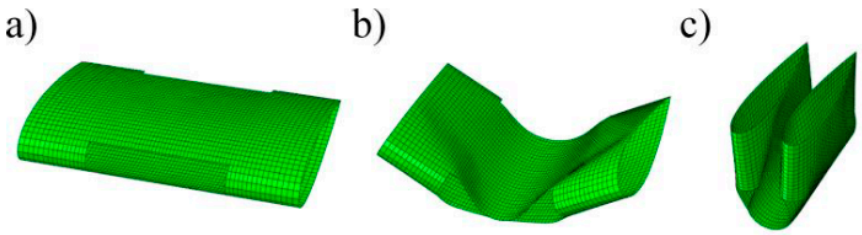

Fig. 9 Finite element model of the folding wing section: a. Initial configuration, b. Inner surfaces reached contact, c. Folded configuration.

From: Xavier Lachenal, Paul M. Weaver and Alberto Pirrera, "Concept for a deployable wing", Proceedings of the ASME 2014 Conference on Smart Materials, Adaptive Structures and Intelligent Systems, SMASIS2014, September 8-10, 2014, Newport, Rhode Island, USA

See:
http://www.bristol.ac.uk/engineering/people/alberto-pirrera/index.html
https://scholar.google.com/citations?user=IRkgQzcAAAAJ&hl=en
https://www.researchgate.net/profile/Alberto_Pirrera
https://epsrc.ukri.org/about/people/alberto-pirrera/

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Biography:
Alberto Pirrera is a Senior Lecturer in Composite Structures and currently holds an EPSRC Early Career Research Fellowship (2015-2020) at the Department of Aerospace Engineering of the University of Bristol, where he has been a faculty member since 2013 and where he completed his PhD in 2011. Before that, Alberto obtained his Master's in Aerospace Engineering from Università degli Studi di Palermo, in Italy. His academic home is the Advanced Composites Centre for Innovation & Science (ACCIS), where he is actively involved with its Centre for Doctoral Training. A modeller and a theoretician specialising in engineering science, Alberto's research interests lie in the area of structural analysis, design and optimisation. In recent years, he has focused on well-behaved nonlinear structures, on morphing, adaptive and shape changing devices and on wind turbine blades.

Research Interests:

Nonlinear structures, Numerical continuation, Multistaple structures for morphing applications, Buckling and post-buckling, Wind turbine blade structures, Mechanics of plates and shells, Structural optimization, Numerical analysis and finite element method

Selected Publications:

Carrella, A., Friswell, M.I., Pirrera, A., Aglietti, G.S., 2008. Numerical and experimental analysis of a square bistable plate. In: Proceedings of Isma 2008: International Conference on Noise And Vibration Engineering, vols. 1–8. Katholieke Univ Leuven, Dept. Werktuigkunde, Heverlee, pp. 3433–3440

Pirrera, A. and Weaver, P. M.: Geometrically Nonlinear First-Order Shear Deformation Theory for General Anisotropic Shells. AIAA Journal, vol. 47, no. 3, 2009, pp. 767-782.

A. Pirrera, D. Avitabile and P.M. Weaver, "Bistable plates for morphing structures: A refined analytical approach with high-order polynomials", International Journal of Solids and Structures, Vol. 47, Nos. 25-26, December 2010, pp. 3412-3425

Pirrera, A., 2011. Bistable Structures for Morphing Applications Using Anisotropic Shells. Ph.D. Thesis, University of Bristol.

Pirrera A, Avitabile D and Weaver P M 2012 On the thermally induced bistability of composite cylindrical shells for morphing structures Int. J. Solids Struct. 49 685–700

A. Brinkmeyer, M. Santer, A. Pirrera, and P. M. Weaver, "Pseudo-bistable self-actuated domes for morphing applications," International Journal of Solids and Structures, vol. 49, pp. 1077-1087, 5/1/ 2012.

Neil Buckney, Alberto Pirrera, Steven D. Green and Paul M. Weaver, "Structural efficiency of a wind turbine blade", Thin-Walled Structures, Vol. 67, pp 144-154, June 2013

Eckstein E., Pirrera A., Weaver P.M. Morphing high-temperature composite plates utilizing thermal gradients Compos. Struct., 100 (2013), pp. 363-372

Coburn B H, Pirrera A, Weaver P M and Vidoli S 2013 Tristability of an orthotropic doubly curved shell Compos. Struct. 96 446–54

A. Brinkmeyer, A. Pirrera, M. Santer and P.M. Weaver, "Pseudo-bistable pre-stress morphing composite panels", International Journal of Solids and Structures, Vol. 50, Nos. 7-8, pp 1033-1043, April 2013

Alberto Pirrera, Xavier Lachenal, Stephen Daynes, Paul M. Weaver and Isaac V. Chenchiah, "Multi-stable cylindrical lattices", Journal of the Mechanics and Physics of Solids, Vol. 61, pp 2087-2107, November 2013

Eckstein E, Pirrera A and Weaver P M 2014 Multi-mode morphing using initially curved composite plates Compos. Struct. 109 240–5

Lamacchia E, Pirrera A, Chenchiah I V and Weaver P M 2014 Non-axisymmetric bending of thin annular plates due to circumferentially distributed moments Int. J. Solids Struct. 51 622–32

Xavier Lachenal, Paul M. Weaver and Alberto Pirrera, "Concept for a deployable wing", Proceedings of the ASME 2014 Conference on Smart Materials, Adaptive Structures and Intelligent Systems, SMASIS2014, September 8-10, 2014, Newport, Rhode Island, USA

M. Capuzzi, A. Pirrera and P.M. Weaver, "Structural design of a novel aeroelastically tailored wind turbine blade", Thin-Walled Structures, Vol. 95, pp 7-15, October 2015

E. Lamacchia, A. Pirrera, I.V. Chenchiah and P.M. Weaver, "Morphing shell structures: A generalized modeling approach", Composite Structures, Vol. 131, pp 1017-1027, November 2015

Neville, R. M., Scarpa, F. & Pirrera, A. Shape morphing Kirigami mechanical metamaterials. Scientific Reports 6, 31067 (2016).

Eric Eckstein, Alberto Pirrera, and Paul M Weaver. "Thermally Driven Morphing and Snap-Through Behavior of Hybrid Laminate Shells", AIAA Journal, Vol. 54, No. 5 (2016), pp. 1778-1788.

Arena G., Groh R.M.J., Brinkmeyer A., Theunissen R., Weaver P.M., Pirrera A. Adaptive compliant structures for flow regulation Proc. R. Soc. Lond. Ser. A Math. Phys. Eng. Sci., 473 (2017), p. 20170334

Neville R.M., Groh R.M.J., Pirrera A., Schenk M. Shape control for experimental continuation Phys. Rev. Lett., 120 (2018), Article 254101
B.S. Cox, R.M.J. Groh, D. Avitabile and A. Pirrera, “Exploring the design space of nonlinear shallow arches with generalized path-following”, Finite Elements in Analysis and Design, Vol. 143, pp 1-10, April 2018
B.S. Cox, R.M.J. Groh, D. Avitabile and A. Pirrera, “Modal nudging in nonlinear elasticity: Tailoring the elastic post-buckling behaviour of engineering structures”, Journal of the Mechanics and Physics of Solids, Vol. 116, pp 135-149, July 2018
R.M.J. Groh and A. Pirrera, “Orthotropy as a driver for complex stability phenomena in cylindrical shell structures”, Composite Structures, Vol. 198 pp 63-72, August 2018
R. Groh, A. Pirrera, Generalised path-following for well-behaved nonlinear structures, Comput. Methods Appl. Mech. Eng. 331 (2018) 394–426.
R.M.J. Groh and A. Pirrera, “Extreme mechanics in laminated shells: New insights”, Extreme Mechanics Letters, Vol. 23, pp 17-23, September 2018