Professor Peter Wriggers

See:
http://de.wikipedia.org/wiki/Peter_Wriggers
http://www.music.uni-hannover.de/272.html
http://www.ikm.uni-hannover.de/26.html?&tx_tkinstpersonen_pi1[alias]=wriggers&cHash=ecb0dbca56
http://www.newcastle.edu.au/staff/profile/peter.wriggers.html
http://www.barnesandnoble.com/c/peter-wriggers
http://65.54.113.26/Author/12544476/peter-wriggers
"images for peter wriggers" - GOOGLE
http://www.worldcat.org/title/nonlinear-finite-element-methods/oclc/646771950/editions?referer=di&editionsView=true
http://www.worldcat.org/title/computational-contact-mechanics/oclc/254169495

Head of the Institute

Institute of Continuum Mechanics
Leibniz Universität Hannover

Biography and Academic Life:
03.02.1951 Born in Hamburg.
1970 – 1976 Civil Engineering study with main emphasis on mechanics at University of Hannover Diplom with "Summa cum Laude"
1980 PhD in Civil Engineering at University of Hannover with grade "Summa cum Laude"
1976 – 1983 Member of staff at Institut for Mechanics, University of Hannover
1983 – 1984 Visiting scholar at University of California, Berkeley, USA (with Prof. R.L. Taylor)
1988 Habilitation in Mechanics, Lecturer at Institut for Mechanics and Computational Mechanics, University of Hannover
1988 Guest Professor at Department of Civil Engineering, UC Berkeley, USA
1990 – 1998 Full Professor of Mechanics at TH Darmstadt
1995 – 1996 Dean of the Faculty of Mechanics at TH Darmstadt
1996 – 2001 Member of the Senat for PhD programs of DFG (German Science Foundation)
1996 – 1998 Director of the Darmstadt Center for Scientific Computing
1998 – 2001 Associate Editor for Int. J. Numerical Methods in Engineering, Wiley
Since 1998 Full Professor of Mechanics at the Department of Civil Engineering, University of Hannover
Since 1998 Director of the Int. Center for Computational Engineering Sciences (ICCES)
2001 – 2003 Dean of the Faculty of Civil Engineering and Surveying at University of Hannover
Since 2002 Editor-in-Chief of Computational Mechanics
Since 2003 Associated Editor of Bauingenieur (leading German Journal for Civil Engineering)

Books:
1. Nichtlineare Finite-Element-Methoden, Springer-Verlag Berlin/Heidelberg, 2001. XI, 495 S. 250 Abb. Brosch. ISBN 3-540-67747-X
2. New Developments in Contact Problems, Springer-Verlag Berlin/Heidelberg, 1999. VII, 246 pp. 97 figs. Softcover, ISBN 3-211-83154-1
3. Computational Contact Mechanics, Wiley-Verlag, July 2002, 464 Pages, ISBN: 0-471-49680-4
4. Error-controlled Adaptive Finite Elements in Solid Mechanics (Erwin Stein (Editor), Ekkehard Ramm, E. Rank, R. Rannacher, K. Schweizerhof, E. Stein, W. Wendland, G. Wittum, Peter Wriggers, Walter Wunderlich), Wiley-Verlag, November 2002, 422 Pages ISBN: 0-471-49650-2
5. Introduction to Computational Micromechanics (Zohdi, T.I., Wriggers, Peter), Springer-Verlag Berlin/Heidelberg, 2004, 196 Pages, ISBN: 3-540-22820-9
6. Technische Mechanik, Band 4, Hydromechanik, Elemente der Höheren Mechanik, Numerische Methoden Springer-Verlag Berlin/Heidelberg, 3. Aufl. 1999. XI, 434 S. 213 Abb. Brosch., ISBN 3-540-65205-1
7. Formeln und Aufgaben zur Technischen Mechanik 1-3, Statik, Elastostatik, Hydrostatik, Kinetik, Hydrodynamik, Springer-Verlag Berlin/Heidelberg

Journals:
Editor-in-Chief:
Computational Mechanics
Associated Editor
International Journal for Numerical methods in Engineering (1998-2001)
Der Bauingenieur (since 2003)

Member of the Editorial Board:

Since 1990	Engineering Computations
Since 1990	International Journal for Numerical Methods in Engineering
Since 1994	International Journal for Engineering Analysis and Design
Since 1995	Archives of Computational Methods in Engineering
Since 1997	Computers & Structures
Since 1997	International Journal of Solids and Structures
Since 1997	International Journal of Forming Processes
Since 1998	Engineering with Computers
Since 2000	Computer Methods in Applied Mechanics and Engineering
Since 2000	International Journal for Computational Civil and Structural Engineering
Since 2000	Computational Engineering Science
Since 2002	Journal of Computational Biomechanics
Since 2003	International Journal of Computational Methods
Since 2003	Latin American Journal of Solids and Structures
Since 2003	Inernational Journal for Multiscale Computational Engineering

Selected Publications having to do with nonlinear analysis and stability:

P. Wriggers (1) and C. Carstensen (2)
(1) Institut für Mechanik, TH Darmstadt, Hochschulstr. 1, D-6100 Darmstadt, Germany
(2) Institut für Angewandte Mathematik, Universität Hannover, Welfengarten 1, D-3000 Hannover 1, Germany
"An Efficient Algorithm For The Computation Of Stability Points Of Dynamical Systems Under Step Load", Engineering Computations, Vol. 9 No. 6, 1983, pp. 669 – 679,
doi: 10.1108/eb023890
ABSTRACT: Many engineering structures exhibit loss of stability under static and dynamic loading. Due to the significance of these phenomena in engineering design this topic has attracted considerable attention during the last decades. In recent years much effort has been made to devise algorithms within finite element analysis to investigate the static stability behaviour of structures. With these methods stable and unstable paths can be traced, and limit or bifurcation points can be computed efficiently. The associated arc-length or branch-switching procedures are today standard tools in existing finite element codes.

P. Wriggers, W. Wagner and E. Stein (Institut für Baummechanik und Numerische Mechank, Universität Hannover, FRG), "Algorithms for non-linear contact constraints with application to stability problems of rods and shells", Computational Mechanics, Vol. 2, No. 3, 1987, pp. 215-230, doi: 10.1007/BF00571026
ABSTRACT: In this paper a class of non-linear problems is discussed where stability as well as post-buckling behaviour is coupled with contact constraints. The contact conditions are introduced via a perturbed Lagrangian formulation. From this formulation the penalty and Lagrangian multiplier method are derived. Both algorithms are investigated together with an algorithm based on an augmented Lagrangian method. The resulting finite element formulation is applied to structural problems of beams and shells undergoing finite elastic deflections and rotations. For the examination of the post-buckling behaviour the arc-length method is used. The performance of the element formulation and a comparison of the different contact algorithms are demonstrated by numerical examples.

P. Wriggers, W. Wagner, C. Miehe. "A quadratically convergent procedure for the calculation of stability points

in finite element analysis." *Comp. Meth. Appl. Mech. Eng.*, Vol. **70**, 329–347, 1988.

W.Wagner and P. Wriggers (Institut für Baummechanik und Numerische Mechank, Universität Hannover, FRG), "A simple method for the calculation of postcritical branches", Engineering Computations, Vol. 5 No. 2, 1988, pp.103 – 109, doi: 10.1108/eb023727
ABSTRACT: The practical behaviour of problems exhibiting bifurcation with secondary branches cannot be studied in general by using standard path-following methods such as arc-length schemes. Special algorithms have to be employed for the detection of bifurcation and limit points and furthermore for branch-switching. Simple methods for this purpose are given by inspection of the determinant of the tangent stiffness matrix or the calculation of the current stiffness parameter. Near stability points, the associated eigenvalue problem has to be solved in order to calculate the number of existing branches. The associated eigenvectors are used for a perturbation of the solution at bifurcation points. This perturbation is performed by adding the scaled eigenvector to the deformed configuration in an appropriate way. Several examples of beam and shell problems show the performance of the method.

P. Wriggers and J.C. Simo, A general procedure for the direct computation of turning and bifurcation points, Int. J. Num. Meth. Eng. 30, 155-176 (1990).

E. Stein, W. Wagner and P. Wriggers (Institut für Baummechanik und Numerische Mechank, Universität Hannover, FRG), "Nonlinear stability-analysis of shell and contact-problems including branch-switching", Computational Mechanics, Vol. 5, No. 6, 1990, pp. 428-446, doi: 10.1007/BF01113447
ABSTRACT: In the analysis of nonlinear elastic shells often the stability and postbuckling behaviour governs the response. Here we discuss problems which also include contact constraints. A nonlinear cylindrical shell element is derived directly from the associated shell theory using one point integration and a stabilization technique. Within a general solution algorithm a simple but effective branch-switching procedure is presented. Additional considerations allow the treatment of bifurcation problems with contact constraints. Several examples of beam and shell problems show the performance of the developed algorithms and elements.

F. Gruttmann (1), W. Wagner (1), L. Meyer (1) and P. Wriggers (2)
(1) Institut fuer Baumechanik und Numerische Mechanik, Universität Hannover, Applstr, 9A, D-30167, Hannover, Germany
(2) Institut fuer Mechanik, Technische Hochshule Darmstadt, Hochschulstr. 1, D-64289, Darmstadt, Germany
"A nonlinear composite shell element with continuous interlaminar shear stresses", Computational Mechanics, Vol. 13, No. 3, 1993, pp.175-188, doi: 10.1007/BF00370134
ABSTRACT: A numerical model for layered composite structures based on a geometrical nonlinear shell theory is presented. The kinematic is based on a multi-director theory, thus the in-plane displacements of each layer are described by independent director vectors. Using the isoparametric apporach a finite element formulation for quadrilaterals is developed. Continuity of the interlaminar shear stresses is obtained within the nonlinear solution process. Several examples are presented to illustrate the performance of the developed numerical model.

R. Eberlein and P. Wriggers. Finite element concepts for finite elastoplastic strains and isotropic stress response in shells: Theoretical and computational analysis. Computer Methods in Applied Mechanics and Engineering, 171:243–279, 1999

Löhnert, S., Tegeler, K., and Wriggers, P. (2003). A simple wrinkling algorithm for orthotropic membranes at finite deformations. In Oñate, E. and Kröpling, B., editors, Textile Composites and Inflatable Structures, pages 119–122, Barcelona. CIMNE

E.M.B. Campello, P.M. Pimenta, and P. Wriggers. A triangular finite shell element based on a fully nonlinear shell formulation. Computational Mechanics, 31:505–518, 2003.