Publications

MARTIN PHILIP BENDSØE
Professor, cand.scient., dr.techn., Dr.h.c.

Citations, including books:.ISI(WoS): > 10000, H-index= 29; Google Scholar: > 20500, H-index=40.

RESEARCH PUBLICATIONS

1. Theses

1.1 "Optimization of plates." Ph.D. dissertation, MAT-DTU, Lyngby, Denmark, 1983, 90 pp.

see also 2.1 below (dr.techn. thesis)

2. Scientific monographs

2.1 "Optimization of Structural Topology, Shape and Material." Springer Verlag, Berlin Heidelberg, 1995, xii+271 pp.

2.2 "Topology Optimization - Theory, Methods, and Applications." (with Ole Sigmund) Springer Verlag, Berlin Heidelberg, 2003, xiv+370 pp. Second, revised printing, 2004.

3. Scientific monographs (editor)

3.1 "Topology Design of Structures." (C.A.Mota Soares, co-editor), Kluwer Academic Publishers, Dordrecht, 1993, xvi+569 pp.

3.2 "Progress in Industrial Mathematics at ECMI 96" (Morten Brøns and Mads Peter Sørensen, co-editors) B.G. Teubner Verlag, Stuttgart, 1997, 449 pp.

3.3 "Synthesis in Bio Solid Mechanics." (Pauli Pedersen, co-editor), Kluwer Academic Publishers, Dordrecht, x+410 pp.,1999.

3.4 "Topological design optimization of structures, machines and materials - status and perspectives." (Niels Olhoff and Ole Sigmund, co-editors), Kluwer/Springer, Dordrecht/Berlin, xiii+608 pp., 2006.

4. Proceedings (editor)

4.1 Abstracts of the NATO Advanced Research Workshop Topology Design of Structures, Hotel do Mar, Sesimbra, Portugal, June 20-26, 1992. MAT-DTU, 1992, 70 pp.

4.2 DCAMM Anniversary Volume, 1994. Danish Center for Applied Mathematics and Mechanics, Technical University of Denmark, Lyngby, 1994, vi+142 pp.

4.3 Abstracts of the SNF-Workshop on Composite Materials and Systems with Multiple Scales (with M. Pedersen), Denmarks Apotekerforenings Kursusejendom, Hillerød, Denmark, 29.11.96-01.12.96. Department of Mathematics, Technical University of Denmark, DK-2800 Lyngby, 20 pp.

4.4 Abstracts of the NorFa-Workshop on Structural Optimization, Hotel Rebild Bakker, Skørping, Denmark, May 2-4, 1997. Department of Mathematics, Technical University of Denmark, DK-2800 Lyngby, 26 pp.

4.5 "Advanced Topics in Structural Optimization" (with Pauli Pedersen). DCAMM Special Report No. S81, Danish Center for Applied Mathematics and Mechanics, Technical University of Denmark, 1998, 131 pp.

4.6 "Engineering Design Optimization." (with N.Olhoff, J.Rasmussen) Proceedings of the 2nd Max Planck Workshop on Engineering Design Optimization, Hotel Nyborg Strand, Nyborg, Denmark, October 12-14, 2001. Department of Mathematics, Technical University of Denmark, DK-2800 Lyngby, xviii+127 pp., 2001.

4.7 "Structural optimization." (with C. A. Mota Soares, K.K. Choi, and J. Herskovits). Selected papers, III ECCM, Portugal, 2006. Special issue, Computers and Structures , Vol. 86, 2008.

5. Chapters in scientific monographs

5.1 "G-closure and homogenization problems arising in plate optimization." In *Optimization Methods in Structural Design* (Eds. H.Eschenauer, N.Olhoff) Bibliographisches Institut AG, Zurich 1983, pp. 270-275.

5.2 "Generalized plate models and optimal design." In *Homogenization and effective moduli of materials and media* (Eds. J.L.Eriksen, D.Kinderlehrer, R.Kohn, J.-L. Lions), The IMA volumes in mathematics and its applications, Vol. 1., Springer Verlag, Berlin, 1986, pp. 1-26.

5.3 "Design of structure and controllers for optimal performance." In *Computer Aided Optimal Design: Structural and Mechanical Systems* (Ed. C.A.M.Soares), NATO ASI Series F, Springer Verlag, 1987, pp. 181-193.

5.4 "Composite Materials as a Basis for Generating Optimal Topologies in Shape Design." In *Structural Optimization* (Eds.: G.I.N.Rozvany and B.L.Karihaloo) Kluwer Academic Publishers, Dordrecht, 1988. pp. 31-38.

5.5 "Optimal Topology Design and Homogenization." In *Mecanique, Modelisation Numerique et Dynamique des Materiaux* (Eds. R.H.Blanc, M.Raous, P.Suquet), Publ. LMA, CNRS, Marseille, 1991, pp. 223-244.

5.6 "On CAD-integrated structural topology and design optimization." (with N.Olhoff, J.Rasmussen), In *Shape and Layout Optimization of Structural Systems and Optimality criteria Methods* (G.I.N.Rozvany, ed.), CISM Lectures No. 325, Springer Verlag, 1992, pp. 171-197.

5.7 "Topology and Generalized Layout Optimization of Elastic Structures." (with A.Diaz, N.Kikuchi), In *Topology Design of Structures* (M.P.Bendsøe, C.A.Mota Soares, eds.), Kluwer Academic Publishers, Dordrecht, The Netherlands, 1993, pp. 159-206.

5.8 "A Displacement-Based Topology Design Method with Self-Adaptive Layered Materials." (with C.S.Jog, R.B.Haber) In *Topology Design of Structures* (M.P.Bendsøe, C.A.Mota Soares, eds.), Kluwer Academic Publishers, Dordrecht, The Netherlands, 1993, pp 219-338.

5.9 "Truss Topology Optimization by a Displacement Based Optimality Criteria Method."(with A.Ben-Tal) In *Optimization of Large Structural Systems, Vol. 1* (G.I.N. Rozvany, ed.), Kluwer Academic Publishers, Dordrecht, The Netherlands, 1993, pp.. 139-152.

5.10 "A Unified Approach to the Analysis and Design of Elasto-Plastic Structures with Mechanical Contact." (with N.Olhoff, J.E.Taylor) In *Optimization of Large Structural Systems, Vol. 2* (G.I.N. Rozvany, ed.), Kluwer Academic Publishers, Dordrecht, The Netherlands, 1993, pp. 697-705.

5.11 "Topology and layout optimization of discrete and continuum structures." (with N. Kikuchi) Chapter 19 in *Structural Optimization - Status and Promise* (M.P.Kamat, ed.), AIAA Progress in Aeronautics and Astronautics Series, Vol. 150, American Institute of Aeronautics and Astronautics, Washington D.C, USA, 1993, pp. 517-547.

5.12 "Topology Design Using a Material with Self-Optimizing Microstructure." (with C.S.Jog, R.B.Haber) In *Optimal Design with Advanced Materials* (P.Pedersen, ed.), Elsevier, Amsterdam, The Netherlands, 1993, pp. 7-23.

5.13 "On CAD-integrated structural topology and design optimization." (with N.Olhoff, J.Rasmussen) In *Evaluation of Global Bearing Capacities fo Structures* (G. Sacchi Landriani, J. Salencon, eds.), International Centre for Mechanical Sciences, Udine, Italy. Springer Verlag, Vienna, 1993, pp. 253-280.

5.14 "On the Prediction of Extremal Material Properties for the Optimal Design of Topology, Shape and Material." (with A.R.Diaz, R.Lipton, J.E.Taylor), In *Composite Media and Homogenization* (G. Dal Maso, G. Dell'Antonio, Eds.), World Scientific Publishing, Singapore, 1995, pp. 65-92.

5.15 "Structural optimization of and with advanced materials." In Theoretical and Applied Mechanics, 1996 (T.Tatsumi, E.Watanabe, T.Kambe, eds.), Elsevier Science B.V., Amsterdam, 1997, pp. 269-284.

5.16 "Topology design of structures, materials and mechanisms - status and perspectives." In System Modelling and Optimization - Methods, Theory and Applications (M.J.D. Powell and S. Scholtes, ed.), Kluwer Academic Publishers, Boston/Dordrecht/London, 2000, pp. 1-17.

5.17 "Topology Optimization." In Encyclopedia of Optimization Vol. 5 (C.A.Floudas, P.M.Pardalos, eds.), Kluwer Academic Publishers, Dordrecht, 2001, pp. 462-464.

5.18 " Computational Challenges for Multi-Physics Topology Optimization" In Computational Mechanics - Solids, Structures and Coupled Problems (Plenary and Keynote presentations), (Carlos A. Mota Soares et al., eds), Springer, Dordrecht, The Netherlands, 2006, pp. 1-20.

5.19 "Topology optimization." (with Ole Sigmund) In Optimization of Structural and Mechanical Systems (J.S.Arora, Ed.) World Scientific, Singapore, 2007, pp. 161-194.

5.20 "Topology Optimization." In Encyclopedia of Optimization Vol. 5 (C.A.Floudas, P.M.Pardalos, eds.), Springer, 2008 (updated version of 5.17).

6. Papers in international refereed journals

6.1 "On the existence of observable single-output systems of a simple type." **SIAM J. Control and Optimization**, Vol. 19 (1981), pp. 555-559.

6.2 "On obtaining a solution to optimization problems for solid, elastic plates by restriction of the design space." **J. Struct. Mech.**, Vol. 11 (1983), pp. 501-521.

6.3 "An interpretation for min-max structural design problems including a method for relaxing constraints." (with J.E.Taylor) **Int. J. Solids Struct.**, Vol. 20 (1984), pp. 301-314.

6.4 "A variational formulation for multicriteria structural optimization." (with N.Olhoff, J.E.Taylor) **J. Struct. Mech.**, Vol. 11 (1983), pp. 523-544

6.5 "A method of design against vibration resonance of beams and shafts." (with N.Olhoff) **Optim. Control Appl. Methods**, Vol. 6 (1985), pp. 191-200.

6.6 "Sensitivity analysis of problems of elasticity with unilateral constraints." (with N.Olhoff, J.Sokolowski) **J. Struct. Mech.**, Vol. 13 (1985), pp. 201-222.

6.7 "Least-weight design of perforated plates. Part I." (with G.I.N.Rozvany, T.G.Ong, W.T.Szeto, N.Olhoff) **Int. J. Solids Struct.**, Vol. 23 (1987), pp. 521-536.

6.8 "Least-weight design of perforated plates. Part II." (with G.I.N. Rozvany, T.G.Ong, W.T.Szeto, N.Olhoff) **Int. J. Solids Struct.**, Vol. 23 (1987), pp. 537-550.

6.9 "Sensitivity analysis and optimization of elastic-plastic structures." (with J.Sokolowski) **J. Engng. Optimization**, Vol. 11 (1987), pp. 31-38.

6.10 "Sensitivity analysis and optimal design of elastic plates with unilateral point supports." (with J.Sokolowski) **Mechanics of Structures and Machines**, Vol. 15 (1987), pp. 383-393.

6.11 "On the design of structure and controls for optimal performance of actively controlled flexible structures." (with N.Olhoff, J.E.Taylor) **Mechanics of Structures and Machines**, Vol. 15 (1987), pp. 265-295.

6.12 "Design sensitivity analysis of elastic-plastic analysis problems." (with J.Sokolowski) **Mechanics of Structures and Machines**, Vol. 16 (1988), pp. 81-102.

6.13 "Generating Optimal Topologies in Structural Design Using a Homogenization Method." (with N.Kikuchi) **Comput. Meth. Appl. Mech. Engng.**, Vol. 71 (1988), pp. 197-224.

6.14 "Scale Effects in the Optimal Design of a Microstructured Medium against Buckling." (with N.Triantafyllidis) **Int. J. Solids Struct.**, Vol. 26 (1990), pp. 725-741.

6.15 "Optimal Shape Design as a Material Distribution Problem." **Structural Optimization.**, Vol. 1 (1989), pp. 193-202.

6.16 "Integrated Topology and Boundary Shape Optimization of 2-D Solids." (with H.C.Rodrigues) **Comput. Meth. Appl. Mech. Engng.**, Vol. 87 (1991), pp. 15-34.

6.17 "Topology and boundary variations in shape optimization." (with H.C.Rodrigues) **Control and Cybernetics**, Vol. 19 (1990), pp. 9-26.

6.18 "On CAD-integrated structural topology and design optimization." (with N.Olhoff, J.Rasmussen) **Comput. Meth. Appl. Mech. Engng.**, Vol. 89 (1991), pp. 259-279.

6.19 "Shape Optimization of Structures for Multiple Loading Conditions using a Homogenization Method." (with A.Diaz) **Structural Optimization,** Vol. 4 (1992), pp. 17-22.

6.20 "Equivalent displacement based formulations for maximum strength truss topology design." (with W.Achtziger, A.Ben-Tal, J.Zowe) **IMPACT of Computing in Science and Engineering**, Vol. 4 (1992), pp. 315-345.

6.21 "A new method for optimal truss topology design." (with A.Ben-Tal) **SIAM J. Optimization**, Vol. 3 (1993), pp. 322-358.

6.22 "An Analytical Model to Predict Optimal Material Properties in the Context of Optimal Structural Design." (with J.M. Guedes, R.B.Haber, P.Pedersen, J.E.Taylor) **J.Appl.Mech.**, Vol. 61 (1994), pp. 930-937.

6.23 "Optimization Methods for Truss Geometry and Topology Design." (with A.Ben-Tal, J.Zowe) **Structural Optimization**, Vol. 7 (1994), pp. 141-159.

6.24 "Some Computational Aspects of Using Extremal Material Properties in the Optimal Design of Shape, Topology and Material." (with J.M.Guedes) **Control and Cybernetics**, Vol. 23 (1994), pp. 327-349.

6.25 "The Michell Layout Problem as a Low Volume Fraction Limit of the Homogenization Method for Topology Design: An Asymptotic Study." (with R.B.Haber) **Structural Optimization**, Vol. 6 (1993), pp. 263-267.

6.26 "Optimization of Material Properties for Mindlin Plate Design." (with A.R.Diaz) **Structural Optimization**, Vol. 6 (1993), pp. 268-270.

6.27 "Topology Design with Optimized, Self-Adaptive Materials." (with C.S.Jog, R.B.Haber) **Int. J. Num. Meth. Engng,** Vol. 37. (1994), pp. 1323-1350.

6.28 "Optimization of Material Properties for Improved Frequency Responce." (with A.R.Diaz) **Structural Optimization**, Vol. 7 (1994), pp. 138-140.

6.29 "Shape Sensitivity Analysis of Optimal Compliance Functionals." (with J.Sokolowski) **Mechanics of Structures and Machines**, Vol. 23 (1994), pp. 35-58.

6.30 "Optimal Design of Material Properties and Material Distribution for Multiple Loading Conditions." (with A.R.Diaz, R.Lipton, J.E.Taylor) **Int. J. Num. Meth. Engng.**, Vol. 38 (1995), pp. 1149-1170.

6.31 "Layout Optimization of Structures." (with G.I.N. Rozvany, U. Kirsch) **Applied Mechanics Reviews**, Vol. 48 (1995), pp. 41-118. Addendum in Vol. 49 (1996), p. 54.

6.32 "Necessary Conditions for Optimal Design of Structures with a Non-Smooth Eigenvalue Based Criterion." (with H. C. Rodrigues and J. M. Guedes) **Structural Optimization**, Vol. 9, 1995, pp. 52-56.

6.33 "Optimization of Structure and Material Properties for Solids Composed of Softening Material." (with J.M. Guedes, S.Plaxton, J.E.Taylor) **Int. J. Solids Struct.**, Vol. 33, 1996, pp. 1799-1813.

6.34 "Design for maximal flexibility as a simple computational model of damage." (with W. Actziger) **Structural Optimization**, Vol. 10, 1995, pp. 258-268.

6.35 "Parametrization in Laminate Design for Optimal Compliance." (with V.B. Hammer, R. Lipton and P. Pedersen) **Int. J. Solids Struct.**, Vol. 34, 1997, pp. 415-434.

6.36 "A new Approach to Variable-Topology Shape Design Using a Constraint on the Perimeter." (with R.B. Haber, C.S. Jog) **Structural Optimization**, Vol. 11, 1996, pp. 1-12.

6.37 "Extremal Overall Elastic Response of Polycrystalline Materials." (with R. Lipton) **J. Mech. Phys. Solids**, Vol. 45, 1997, pp. 1765-1780.

6.38 "Free Material Optimization via Mathematical Programming." (with J.Zowe, M. Kocvara) **Math. Programming B**, Vol. 79, 1997, pp. 445-466.

6.39 "Bounds on the Effect of Progressive Structural Degradation." (with W. Achtziger, J.E.Taylor) **J. Mech. Phys. Solids**, Vol. 46, 1998, pp. 1055-1087.

6.40 "A Method for treating Damage Related Criteria in Optimal Topology Design of Continuum Structures." (with A. Diaz). **Structural Optimization**, Vol. 16, 1998, pp. 108-115.

6.41 "A Formulation for Optimal Continuum Structures with a Decompositon of Material Properties into Specified and Designable Parts." (with J.E.Taylor and P.D. Washabaugh). **Control and Cybernetics**, Vol. 27, 1998, pp. 255-264

6.42 "Topology Optimization of Continuum Structures with Local Stress Constraints." (with P.Duysinx) **Int. J. Num. Meth. Engng.**, Vol. 43, 1998, pp. 1453-1478.

6.43 "Optimal Topology Design of Discrete Structures Resisting Degradation Effects." (with W. Achtziger) **Structural Optimization**, Vol. 17, 1999, pp. 74-78.

6.44 "Material Interpolation Schemes in Topology Optimization." (with O. Sigmund) **Arch. Applied Mech.**, Vol. 69, 1999, pp. 635-654.

6.45 "An Optimization Problem for Predicting the Maximal Effect of Degradation of Mechanical Structures." (with W. Achtziger, J.E.Taylor) **SIAM J. Optimization**, Vol. 10, 2000, pp. 982-998.

6.46 "A Mutual Energy Formulation for Optimal Structural Design." (with J.E. Taylor) **Structural and Multidisciplinary Optimization**, Vol. 22, 2001, pp. 95-101.

6.47 "Hierarchical Optimization of Material and Structure." (with H. Rodrigues, J.M. Guedes). **Structural and Multidisciplinary Optimization**, Vol. 24, 2002, pp. 1-10.

6.48 "Topology Optimization of Periodic Microstructures with a Penalization of Highly Localized Buckling Modes." (with M.M. Neves and Ole Sigmund). **Int. J. Num. Meth. Engng.**, Vol. 54, 2002, pp. 809-834.

6.49 "A Material Optimization Model to Approximate Energy Bounds for Cellular Materials under Multiload Conditions." (with H. Rodrigues, J.M. Guedes). **Structural and Multidisciplinary Optimization**, Vol. 25, 2003, 446 - 452.

6.50 "Layout Optimization of Structures with Finite-size Features using Multiresolution Analysis." (with S. Chellappa and A. R. Diaz). **Structural and Multidisciplinary Optimization**, Vol. 26, 2004, pp. 77 - 91

6.51 "Hinge-free topology optimization with embedded translation-invariant differentiable wavelet shrinkage." (with G. H. Yoon, Y. Y. Kim, and Ole. Sigmund) **Structural and Multidisciplinary Optimization**, Vol. 27, 2004, pp. 139 - 150.

6.52 "Articulated Mechanism Design by Graph Theoretical Enumeration." (with A. Kawamoto and O. Sigmund) **Structural and Multidisciplinary Optimization**, Vol. 27, 2004, pp. 295 - 299.

6.53 "A geometry projection method for shape optimization" (with J. Norato, R. Haber and D. Tortorelli). **Int. J. Num. Meth. Engng.**, Vol. 60 (14), 2004, pp. 2289-2312.

6.54 "Articulated Mechanism Design with a Degree of Freedom Constraint." (with A. Kawamoto and O. Sigmund) **Int. J. Num. Meth. Engng.**, Vol. 61 (9), 2004, pp. 1520-1545.

6.55 "Topology Optimization -- broadening the areas of application." (with E. Lund, N. Olhoff and O. Sigmund). **Control and Cybernetics**. Vol. 34 (1), 2005, pp. 7-35.

6.56 "Topology optimization of heat conduction problems using the finite volume method." (with A. Gersborg-Hansen and O. Sigmund), **Structural and Multidisciplinary Optimization**, Vol. 31 (4), 2006, pp. 251-259.

6.57 "On two formulations of an optimal insulation problem." (with E. Munoz and G. Allaire). **Structural and Multidisciplinary Optimization**, Vol. 33 (4-5), 2007, pp. 363-373.

6.58 "A topological derivative method for topology optimization." (with J. Norato, R. Haber and D. Tortorelli). **Structural and Multidisciplinary Optimization**, Vol. 33 (4-5), 2007, pp. 375-386.

6.59 "A shape optimization study for tool design in resistance welding." (with M.Bogomolny, and J.Hattel). **Structural and Multidisciplinary Optimization**, Vol. 38, 2009, pp. 185-194,

6.60 "Optimization of friction stir welding using space mapping and manifold mapping – An initial study of thermal aspects." (with A.A.Larsen, Henrik Schmidt, and J.Hattel). **Structural and Multidisciplinary Optimization**, Vol. 38, 2009, pp. 289-299.

6,61 Approximate Reanalysis in Topology Optimization." (with O. Amir and O. Sigmund). **Int. J. Num. Meth. Engng.**, Vol: 78, 2009, pp. 1474-1491.

6.62 "Global optima for the Zhou-Rozvany problem." (with M.Stolpe). **Structural and Multidisciplinary Optimization**, Vol: 43, 2011, pp. 151-164.

7. Preprints

8. Other papers in journals/books, reviews, etc.

8.1 "Shape Optimization as a Discrete Optimization Problem - Solution Procedures Using Continuous Approximations." **DORSnyt** (Danish Operations Research Society) No. 83 (1989), pp. 46-53.

8.2 "BOOK REVIEW: Shape Optimization by the Homogenization Method by G. Allaire." **Structural and Multidisciplinary Optimization**, Vol. 24, 2002, p. 405.

8.3 "Joakim Petersson 1968-2002 - Obituary." (with A. Klarbring) **Structural and Multidisciplinary Optimization**, Vol. 25 (3): 2003, pp. 151-152.

8.4 "BOOK REVIEW: Structural Sensitivity Analysis and Optimization, Volumes 1 and 2 by K. K. Choi and Nam-Ho Kim." **Structural and Multidisciplinary Optimization**, Vol. 23 (2): 2006, pp. 169-170.

8.5 "In memoriam: John E. Taylor 1931-2005." (with N. Olhoff ·and G.I.N Rozvany) **Structural and Multidisciplinary Optimization**, Vol. 33 (3) 2007, pp. 173-177.

9. Papers in conference proceedings

9.1 "Some smear-out models for plates with stiffeners and applications to plate optimization." In **Proc. Int. Symposium on Optimum Structural Design**, Tucson, Arizona, Oct. 1981. Pineridge Press Ltd., Swansea, 1982, pp. 13-29 to 13-34

9.2 "Control of the natural frequencies of vibrating beams and rotating shafts." (with N. Olhoff) In **Proc. First IASTED Int. Symp. on Applied Control and Identification**, Copenhagen, Denmark, June 28 to July 1, 1983. IASTED, Control Eng. Inst., Techn. Univ. of Denmark, 1983, pp. 1-18 to 1-23.

9.3 "Existence proofs for a class of plate optimization problems." In *Systems Modelling and Optimization* (P. Thoft-Christensen, ed.), Proc. 11th IFIP Conference, Copenhagen, July 25-29, 1983, **Lecture Notes in Control and Information Sciences**, Vol. 59, Springer Verlag, Berlin, 1984, pp. 773-779.

9.4 "On optimal design of actively controlled distributed parameter structures." In *Boundary Control and Boundary Variations* (J.P. Zolesio, ed.), Proc. IFIP WG 7.2 Conf., Nice, France, June 10-13, 1986. **Lecture Notes in Control and Information Sciences**, Vol. 100, Springer Verlag, Berlin, 1988, pp. 55-71.

9.5 "Shape Optimization as a Discrete Optimization Problem - Solution Procedures Using Continuous Approximations." In *Discretization Methods and Structural Optimization - Procedures and Applications*

(H.A.Eschenauer, G. Thierauf, eds.), Proc. GAMM-Seminar, Siegen, FRG., Oct. 5-7, 1988. **Lecture Notes in Engineering**, Vol. 42, Springer Verlag, Berlin, 1989, pp. 40-47.

9.6 "On CAD-integrated structural topology and design optimization". (with N.Olhoff, J.Rasmussen) **Proc. 2nd. World Congress on Computational Mechanics**, Stuttgart, FRG, Aug. 27-31, 1990, pp. 95-99.

9.7 "Topology and Boundary Shape Optimization as an Integrated Design Tool for Computer Aided Design." (with J.Rasmussen, H.C.Rodrigues) In *Engineering Optimization in Design Processes* (H.A.Eschenauer, C.Mattheck, N.Olhoff, eds.) **Lecture Notes in Engng.**, Vol 63, Springer Verlag, Berlin, 1991, pp. 27-34.

9.8 "A Unified Approach to the Analysis and Design of Elasto-Plastic Structures with Mechanical Contact." (with N.Olhoff, J.E.Taylor) **Proc. 3rd. Air Force/NASA Symposium on Recent Advances in Multi-disciplinary Analysis and Optimization**, San Francisco, California, Sept. 24-26, 1990, pp. 340-346.

9.9 "Topology and Boundary Shape Optimization as an Integrated Design Tool." (with H.C.Rodrigues) **Proc. 3rd. Air Force/NASA Symposium on Recent Advances in Multidisciplinary Analysis and Optimization**, San Francisco, California, Sept. 24-26, 1990, pp. 364-369.

9.10 "New Displacement-Based Methods for Optimal Truss Topology Design." (with A.Ben-Tal and R.T.Haftka) **Proc. 32nd AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics and Materials Conference**, Baltimore, MD, USA, April 8-10, 1991. 16 pp.

9.11 "Topology Design with Optimized Layered Materials." (with C.S.Jog, R.B.Haber) Proc. **Fifth Nordic Seminar on Computational Mechanics** (K.Aakjær, ed.), Aalborg, Denmark, Nov.5-6, 1992. Dept. of Build. Techn. Struct. Engng., University of Aalborg, Denmark, 1992, pp. 174-177.

9.12 "On the Prediction of Extremal Material Properties for the Optimal Design of Topology, Shape and Material." (with A.R.Diaz, R.Lipton, J.E.Taylor) Proc. **1994 North American Conference on Smart Structures and Materials**, Orlando, Florida, USA, Feb. 13-18, 1994, SPIE - The International Society for Optical Engineering, 1994, 12 pp.

9.13 "Optimal Material Design for Minimum Average Compliance." (with A.R.Diaz, R.Lipton, J.E.Taylor) Proc. **Proc. 3rd World Congress on Computational Mechanics**, Chiba, Japan, August 1994.

9.14 "Optimization of Structure and Material Properties for Solids Composed of Softening Material." (with J.M.Guedes, S.Plaxton, J.E.Taylor) Proc. **5th AIAA/ USAF/NASA/ISSMO Symposium on Multidis-ciplinary Analysis and Optimization**, Panama City, Fl., September 7-9, 1994, Vol. 2, pp. 1057- 1065.

9.15 "On the Prediction of Extremal Material Properties and Optimal Material Distribution for Multiple Loading Conditions." (with A.R.Diaz, R.Lipton, J.E.Taylor) Proc. **20th ASME Design Automation Conference**, Minneapolis, Mn, September 11-14, 1994, ASME publication DE-Vol.69-2, pp. 213-220.

9.16 "Variable-Topology Shape Optimization with a Constraint on the Perimeter." (with C.Jog, R.B.Haber) Proc. **20th ASME Design Automation Conference**, Minneapolis, Mn, September 11-14, 1994, ASME publication DE-Vol.69-2, pp. 261-272.

9.17 "Perimeter Constrained Topology Optimization of Continuum Structures." (with C. Jog and R.B.Haber) Proc. **IUTAM Symposium on Optimization of Mechanical Systems** (D. Bestle, W. Schielen, eds.), Stuttgart, March 26-31, 1995. Kluwer Academic Publishers, Dordrecht, The Netherlands, 1996, pp.113-120.

9.18 "Optimization of Structure and Material Properties for Solids Composed of Softening Material" (with J.M. Guedes, S.Plaxton, J.E.Taylor) Proc. **IUTAM Symposium on Optimization of Mechanical Systems** (D. Bestle, W. Schielen, eds.), Stuttgart, March 26-31, 1995. Kluwer Academic Publishers, Dordrecht, The Netherlands, 1996, pp. 17-24.

9.19 "Shape Sensitivity Analysis of Nonsmooth Shape Functionals." (with J. Sokolowski) In *Recent Developments in Optimization* (R.Durier, C. Michelot, eds.), Proc. Seventh French-German Optimization Meeting, June 27-July 2, 1994. **Lecture Notes in Economics and Mathematical Systems**, Springer Verlag, Berlin, 10, 1995, pp. 36-45.

9.20 "The Perimeter Method - A New Approach to Variable-Topology Shape Optimization." (with R.B.Haber, C.Jog) Proc. **First World Congress of Structural and Multidisciplinary Optimization** (N. Olhoff, G.I.N. Rozvany, eds.) Pergamon Press, Oxford, 1995, pp. 153-160.

9.21 "On strain-stress fields resulting from optimal orientation." (with P.Pedersen) Proc. **First World Congress of Structural and Multidisciplinary Optimization** (N. Olhoff, G.I.N. Rozvany, eds.), Pergamon Press, Oxford, 1995, pp. 243-250.

9.22 "Minimum Compliance Design of Laminated Plates." (with V.B. Hammer, R. Lipton and P. Pedersen) Proc. **Int. Conference on Homogenization and Applications to Material Sciences**, Nice, France, June 6-10, 1995 (D. Cioranescu, A. Damlamian, P. Donato, eds.), GAKUTO Int. Series in Math. Sci, Appl., Vol. 9, Gakkotosho, Tokyo, 1997, pp.45-56.

9.23 "A method for treating damage related constraints in optimal topology design of continuum structures." (with A. Diaz) Proc. **Second World Congress of Structural and Multidisciplinary Optimization** (W. Gutkowski, Z. Mroz, eds.), Inst. of Fundamental Technological Research, Warsaw, 1997, pp 523-526.

9.24 "Bounds on the effect of progressive structural degradation. Part I: Modelling." (with W. Achtziger, J.E.Taylor) Proc. **Second World Congress of Structural and Multidisciplinary Optimization** (W. Gutkowski, Z. Mroz, eds.), Inst. of Fundamental Technological Research, Warsaw, 1997, pp 3-8.

9.25 "Bounds on the effect of progressive structural degradation. Part II: Numerical optimization." (with W. Achtziger, J.E.Taylor) Proc. **Second World Congress of Structural and Multidisciplinary Optimization** (W. Gutkowski, Z. Mroz, eds.), Inst. of Fundamental Technological Research, Warsaw, 1997, pp 9-14.

9.26 "Topology Optimization of Continuum Structures with Stress Constraints." (with P. Duysinx) Proc. **Second World Congress of Structural and Multidisciplinary Optimization** (W. Gutkowski, Z. Mroz, eds.), Inst. of Fundamental Technological Research, Warsaw, 1997, pp 527-532.

9.27 "Recent Developments in Topology Design of Continuum Structures" Proc. **NAFEMS Seminar on Topology Optimization**, Sept. 23, 1997, Aalen, Germany. NAFEMS-Vertretung, c/o CAD-FEM GmbH, Grafing, 1997. 8 pp.

9.28 "On Some Optimal Design Techniques for Modelling Structural Degradation" (with W. Achtziger, J.E.Taylor) Proc. **10th Nordic Seminar on Computational Mechanics**, 24-25 Oct., 1997, Tallinn, Estonia. Tallinn Technical University, Tallinn, 1997, pp. 38-41.

9.29 "Global and Local Optimization Models Applied to Anisotropic Bone Adaptation." (with H. C. Rodrigues, C. Jacobs and J. M. Guedes). In **Synthesis in Bio Solid Mechanics** (P. Pedersen, M.P.Bendsoe, eds.), Kluwer Academic Publishers, Dordrecht, 1999, pp. 209-220.

9.30 "Problem Formulation, Solution Procedures and Geometric Modeling: Key issues in Variable-Topology Optimization." (with R.B. Haber). Proc. 7th **AIAA/USAF/NASA/ISSMO Symposium on Multidisciplinary Analysis and Optimization**, St. Louis, MI, Sept. 2-4, 1998, pp. 1864-1873.

9.31 "On Optimization, Damage, and Design." (with V.B. Hammer, P. Pedersen and A.R. Díaz). Proc. 7th **AIAA/USAF/NASA/ISSMO Symposium on Multidisciplinary Analysis and Optimization**, St. Louis, MI, Sept. 2-4, 1998, pp. 1458-1468.

9.32 "Hierarchical Optimization of Material and Structure." (with H. Rodrigues and J.M. Guedes) Proc. **Third World Congress of Structural and Multidisciplinary Optimization** (C. Bloembaum, ed.), University of New York at Buffalo, pp. 434-436.

9.33 "Optimal Design of Discrete Engineering Structures Resisting Effects of Material Degradation." (with W. Achtziger) **Operations Research Proceedings 1999** (K. Inderfurth, G. Schwœdiauer, W. Domschke, F. Juhnke, P. Kleinschmidt and G. Wäscher (Eds.), Springer, Heidelberg, 2000, pp.1-6.

9.34 "Variable-Topology Optimization: Status and Challenges". Proc. **European Conference on Computational Mechanics** (W. Wunderlich, ed.), München, Germany, August 31 - September 3, 1999. CD by Lehrstuhl für Statik, Technische Universität München, Paper # 137, 20 pp.

9.35 "Recent Results on Topology Optimization of Periodic Composites." (with M.M.Neves and O. Sigmund) In **Topology Optimization of Structures and Composite Continua** (G.I.N. Rozvany, N. Olhoff, eds.), Kluwer Academic Publishers, Dordrecht, 2000, pp. 3-17.

9.36 "A Buckling Performance Index for Topology Design of Periodic Microstructures." (with M.M. Neves and Ole Sigmund). Proc. **ECCOMAS 2000**, Barcelona, 11-14 September 2000.

9.37 "Recent Developments in Topology Design of Materials and Mechanisms." Proc. 32e **Congrès national d'analyse numérique**, 5 - 9 juin 2000, Port d'Albret (Vieux-Boucau, Landes), 18 pp.

9.38 "On the Computational Approximation of Energy Bounds for Multiload Cases With One Level of Microstructure." (with J. M. Guedes and H. Rodrigues). Proc. **4th World Congress of Structural and Multidisciplinary Optimization**, Dalian, China, 2001.

9.39 "Topology Optimization of Periodic Materials with Buckling Constraint." (with M.M. Neves and Ole Sigmund) Proceedings of the **2nd Max Planck Workshop on Engineering Design Optimization**, Hotel Nyborg Strand, Nyborg, Denmark, October 12-14, 2001. Department of Mathematics, Technical University of Denmark, DK-2800 Lyngby, pp. 40-43.

9.40 "Optimal Topology Design of Microstructures with a Constraint on Local Buckling Behaviour." (with M.M. Neves and Ole Sigmund). Proc. **14th Nordic Seminar on Computational Mechanics** (L.Beldie, O. Dahlblom, A.Olsson, N.S.Ottosen and G.Sandberg, eds.) 19-20 October, 2001, Lund, Sweden. Structural Mechanics, LTH, Sweden, pp. 53-56.

9.41 "Topology Optimization of Periodic Microstructures with Buckling Criteria." (with M.M. Neves and Ole Sigmund). Proc. **Fifth World Congress on Computational Mechanics** (H.A. Mang, F.G. Rammersdorfer and J. Eberhardsteiner, eds.), Vienna, Austria, July 7-12, 2002. CD-rom. 11 pp.

9.42 "Aspects of the design of microstructures by computational means." (with J.M. Guedes, M.M. Neves, H.C. Rodrigues and O. Sigmund), In **Homogenization 2001. Proceedings of the First HMS2000 International School and Conference on Homogenization**, Naples, June 18-22 and 23-27, 2001 (L. Carbone and R. De Arcangelis, eds.), GAKUTO Internat. Ser. Math. Sci. Appl., Vol. 18, Gakkotosho, Tokyo, 2003, pp. 99-112.

9.43 "Articulated Mechanism Design by an Enumeration Approach." (with A. Kawamoto and O. Sigmund), Proc. **15th Nordic Seminar on Computational Mechanics** (E. Lund, N. Olhoff, J. Stegmann, eds.) 17-19 October, 2002, Aalborg, Denmark. AAU, Denmark, pp. 59--62.

9.44 "Design of multi-phase structures with optimized vibrational and wave-transmitting properties." (with Jakob S. Jensen, Ole Sigmund, and Jon J. Thomsen), Proc. **15th Nordic Seminar on Computational Mechanics** (E. Lund, N. Olhoff, J. Stegmann, eds.) 17-19 October, 2002, Aalborg, Denmark. AAU, Denmark, pp. 63--66.

9.45 "On Methods for Sensitivity Analysis." (with N. Varchon) In Proc. **ESGI44** (J. Gravesen and P.G. Hjort, eds.), MAT, DTU, Dk-2800 Lyngby, 2003. 9 pp, to appear.

9.46 "Articulated Mechanism Design – Introduction of DOF Constraints." (with A. Kawamoto and O. Sigmund) Proc. **5th World Congress of Structural and Multidisciplinary Optimization** (C. Cinquini, M. Rovatai, P. Venini and R. Nascimbene, EDS.) May 19-23, 2003, Lido de Jesolo, Italy. CD-rom proceedings, paper #98, 6 pages. Italian Press, ISBN 88-88412-27-1.

9.47 "Problems in Layout Optimization with Finite-size Features." (with S. Chellappa and A. R. Diaz) Proc. **5th World Congress of Structural and Multidisciplinary Optimization** (C. Cinquini, M. Rovatai, P. Venini and R. Nascimbene, Eds.) May 19-23, 2003, Lido de Jesolo, Italy. Italian Polytechnic Press, Milano, 2003, pp. 53-54.

9.48 "Topology optimization using the finite volume method." (with A. Gersborg-Hansen1and O. Sigmund). Proc. **6th World Congress of Structural and Multidisciplinary Optimization** (J. Herskovits, Eds.) May 30- June 3, 2005, Rio de Janeiro, Brazil. 10 pp.

9.49 "A Geometry Projection and Optimality Criterion Method for Topology Optimization using the Topological Derivative." (with R.B. Haber, J.Norato and D.A. Tortorelli). Proc. **6th World Congress of Structural and Multidisciplinary Optimization** (J. Herskovits, Eds.) May 30- June 3, 2005, Rio de Janeiro, Brazil. 8 pp.

9.50 "Topology Optimization -- broadening the areas of application." (with E. Lund, N. Olhoff and O. Sigmund). Proc. **1. Konferenz für Angewandte Optimierung** am 21./22. März 2006, Karlsruhe, FRG, updated version of the paper from Control and Cybernetics. Vol. 34 (1), 2005, pp. 7-35; LIMITED CIRCULATION.

9.51 "A Non-Linear Branch and Cut Method for Solving Discrete Minimum Compliance Problems to Global Optimality." (with M. Stolpe) In Proc. **7th World Congress on Structural and Multidisciplinary Optimization** (Ed. B.Y. Kwak et al), COEX Seoul, Korea, May 21-25, 2007 (CD-ROM, ISBN 978-89-959384-2-3 98550), pp. 2513-2522.

9.52 "Some Optimal Design Aspects of Resistance Welding." (with M. Bogomolny) In Proc. **7th World Congress on Structural and Multidisciplinary Optimization** (Ed. B.Y. Kwak et al), COEX Seoul, Korea, May 21-25, 2007 (CD-ROM, ISBN 978-89-959384-2-3 98550), pp. 2687-2695.

9.53 "Estimation of the Welding Speed and Heat Input in Friction Stir Welding using Thermal Models and Optimization." (with C.C. Tutum, H. Schmidt, and J. Hattel) In Proc. **7th World Congress on Structural and Multidisciplinary Optimization** (Ed. B.Y. Kwak et al), COEX Seoul, Korea, May 21-25, 2007 (CD-ROM, ISBN 978-89-959384-2-3 98550), pp. 2639-2646.

9.54 "Optimization of Thermal Aspects of Friction Stir Welding - Initial Studies Using a Space Mapping Technique." (with A.A. Larsen, H. Schmidt, and J. Hattel) In Proc. **7th World Congress on Structural and Multidisciplinary Optimization** (Ed. B.Y. Kwak et al), COEX Seoul, Korea, May 21-25, 2007 (CD-ROM, ISBN 978-89-959384-2-3 98550), pp. 2663-2669.

9,55 "PLATO-N : Developing Specialized Methods for Aeronautics Structural Design Applications." (with M.Stolpe) Proc. **EngOpt 2008 - International Conference on Engineering Optimization**, Rio de Janeiro, Brazil, 01 - 05 June 2008, 10 pp.

9.56 "Robust Optimization of Thermal Aspects of Friction Stir Welding Using Manifold Mapping Techniques." (with Anders A. Larsen, Domenico Lahaye, Jesper Hattel and Henrik Schmidt). Proc. 12th **AIAA/ISSMO Multidisciplinary Analysis and Optimization Conference**, Victoria, British Columbia, Canada, Sept. 10-12, 2008, 14pp.

9.57 "Benders decomposition for discrete material optimization in laminate design with local failure criteria." (with E. Eduardo and M. Stolpe). Proc. **WCSMO-8, Eighth World Congress on Structuctural and Multidisciplinary Optimization**, Lissabon, Portugal (ISBN: 978-989-20-1554-5) , pp. 54-55, 2009.

10. Lecture Notes for Research Courses Published in Bound Volumes

10.1 "Optimal Shape Design as a Material Distribution Problem." Lecture Notes, **COMETT course on Computer Aided Optimal Design**, University of Pavia, Pavia, Italy, 1989, 17 pp. Also in Lecture Notes, **COMETT course on Computer Aided Optimal Design**, Aalborg University, Aalborg, Denmark, 1989.

10.2 "Composites as a Basis for Topology Optimization." Lecture Notes, **COMETT course on Analysis and Design of Structures Made of Composite Materials**, Politecnico di Milano, Italy, May 28 -June 1, 1990, 11 pp.

10.3 "Aspects of Topology Optimization of Structures." Lecture Notes, **Advanced TEMPUS course on Numerical Methods in Computer Aided Optimal Design**, Zakopane, Poland, May 11-15, 1992, 44 pp.

10.4 "Optimisation topologique et les méthodes d'homogénéisation." Lecture Notes, **COMETT Course on Conception optimale de structures assistée par ordinateur**, Liege, Belgium, June 1-5, 1992, 35 pp. In slightly revised form, also as "Optimisation topologique." Lecture Notes, **COMETT/CIMI/CIMPA Course on Conception optimale de structures assistée par ordinateur**, Nice, France, July 13-17, 1992.

10.5 "Topology and Layout Optimization of Elastic Structures using the Homogenization Method." (with A.Diaz, N.Kikuchi) Lecture Notes, **COMETT course on Computer Aided Optimum Design of Structures**, Aalborg University, Aalborg, Denmark, 1993, 41 pp.

10.6 "On Extremal Energy Functionals in the Optimal Design of Shape, Topology and Material." Lecture Notes, **COMETT course on Computer Aided Optimum Design of Structures**, Aalborg University, Aalborg, Denmark, 1993, 41 pp.

10.7 "On the Topology Design of Continuum and Discrete Structures." Lecture Notes, **COMETT Tutorial Computerunterstützte Strukturoptimierung**, Wissen-schaftszentrum Schloß Thurnau, Universität Bayreuth, Germany, 1993 (updated version of 13.3), 106 pp.

10.8 "On the Topology Design of Continuum and Discrete Structures." Lecture Notes, **Kurs i Konstruktionsoptimering**, Mitthögskolan, Östersund, Sweden, 1994. (updated version of 13.3), 106 pp.

10.9 "Structural design for optimal topology, shape and material." Lecture Notes, Fifth **IUTAM International Summer School on Mechanics, Concurrent Engineering Tools for Dynamic Analysis and Optimization** (N. Olhoff, ed.), Aalborg University, Aalborg, Denmark, 1994, 53 pp.

10.10 "Optimal topology design of continuum structures: an introduction." Lecture Notes, **Advanced TEMPUS-AIMETA course on Optimal Design Theory and Applications**, Universita de Pavia, Italy, September 16-21, 1996, 32 pp.
Revised versions:
Lecture notes Ph.D.-course / Advanced school: **Advanced Topics in Structural Optimization**, DCAMM International Graduate Research School, DTU, Lyngby, June 25 - July 3, 1998, 28 pp.
Lecture notes EU-Leonardo Advance Course: **Advanced Optimization and Visualization for Engineering Applications**, Department of Solid Mechanics, Technical University of Denmark, August 23-27, 1999, 28 pp.
Lecture notes Advanced course **Computer Aided Topology Optimization**, Wissen-schaftszentrum Schloß Thurnau, Universität Bayreuth, Germany, April 10 to 12, 2000.

10.11 "On Material Models in Topology Optimization" (with Ole Sigmund) In **Bone Mechanics - Mathematical and Mechanical Models for Analysis and Synthesis** (J.M. Guedes and H.C. Rodrigues, eds.), Centro Internacional de Matematica, Pub. No. 18, Coimbra, 2002, pp. 1-30.

11. Abstracts published in proceedings, without 'full papers'

11.1 "Optimal Design of Rib-reinforced Plates." Abstracts of **21st Annual Meeting, Society of Engineering Science**, Inc., Virginia Polytechnic, Blacksburg, VA, USA, October 15-17, 1984.

11.2 "Sensitivity Analysis of Problems of Elasticity with Unilateral Constraints." (with N.Olhoff, J.Sokolowski) Abstracts of **21st Annual Meeting, Society of Engineering Science**, Inc., Virginia Polytechnic, Blacksburg, VA, USA, October 15-17, 1984.

11.3 "Generating Optimal Topologies in Structural Design Using a Homogenization Method." (with N.Kikuchi) Abstracts of **Second NASA/Air Force Symposium on Recent Advances In Multidisciplinary Analysis and Optimization**, NASA-Langley, Hampton, VA, USA, Sept.28-30,1988.
11.4 "Scale Effects in the Optimal Design of a Microstructured Medium against Buckling." (with N.Triantafyllidis) Abstracts of **1990 SIAM Annual Meeting**, July 16-20, 1990.

11.5 "Smooth and non-smooth methods in the optimal topology design of elastic and elasto-plastic structures." Abstracts of **Workshop on Nondifferentiable Problems in Optimal Design**, Prag, Czechoslovakia, January 23-25, 1992.

11.6 "On the Analytical Prediction of Optimal Material Properties in the Context of Optimal Structural Design." (with J.M. Guedes, R.B.Haber, P.Pedersen, J.E.Taylor) Abstracts of **First SES-ASME-ASCE Joint Meeting** (Herakovich, C.T.; Duva, J.M., Eds.) Univ. of Virginia, Charlottesville, VA, USA, June 6-9, 1993.

11.7 "Topology Design for Manufacturability Using a Self-Adaptive Material Model." (with C.S.Jog, R.B.Haber) Abstracts of **1993 SIAM Annual Meeting**, Philadelphia, PA, USA, July 12-16, 1993.

11.8 "Computational Aspects of Topology Design by the Homogenization Method." (with C.S.Jog, R.B.Haber) Abstracts of **Second U.S. National Congress on Computational Mechanics**, Wahington D.C., USA, August 16-18, 1993.

11.9 "Optimization Methods for Truss Geometry and Topology Design." Abstracts of **4th Stockholm Optimization Days**, Royal Institute of Technology, Stockholm, Sweden, August 16-17, 1993, page 11.

11.10 "Optimal Material Properties in the Context of Optimal Structural Design." Abstracts of the **1994 GAMM Annual Scientific Conference**, Braunschweig, FRG, April 4-8, 1994, page 2.

11.11 "Optimal Design of Material Properties and Material Distribution for Single and Multiple Loading Conditions." Abstracts of **SIAM Symposium on Emerging Issues in Mathematics and Computation from the Materials Science**, Pittsburgh, USA, 18-20 April, 1994.

11.12 "Experience with the Perimeter Method for Topology Optimization." (with R.B.Haber, C.S.Jog) Abstracts of **32nd Annual Technical Meeting of the Society of Engng. Science**, New Orleans, LA, USA, Oct. 29 to Nov. 1, 1995.

11.13 "Compliance Minimization of Laminated Composites." (with V.B.Hammer, R.Lipton, P.Pedersen) Abstracts of **32nd Annual technical Meeting of the Society of Engng. Science**, New Orleans, LA, USA, Oct. 29 to Nov. 1, 1995.

11.14 "An Optimal Design Formulation of Damage Models." (with W.Achtziger) Abstracts of the **EUR-HOMogenization metting**, Poigny, France, Feb. 16-18, 1996.

11.15 "Optimal design and damage." (with W.Achtziger) Abstracts of the **EUROMECH Colloquium 345: The future of structural optimization**, The University of Liverpool, April 1-3, 1996.

11.16 "Design of laminated plates for minimum compliance." Abstracts of the **Fifth SIAM Conference on Optimization**, Victoria, Canada, May 20-22, 1996, p. 40.

11.17 "Bounds on the effect of progressive structural degradation." Abstracts of the Workshop on **Variational Problems with Free Interfaces**, Pisa, February 20-22, 1997, In FBP News, No. 13, May 1997, p. 9. University of Lisbon.

11.18 "Design Optimization: Challenges in Analysis and Computations." Abstracts of **1999 Annual Meeting of Deutche Mathematiker-Vereinigung**, September 6-10, 1999, Mainz, Germany. p. 19. Universität Mainz.

11.19 "Algorithms in structural optimization: Looking ahead (back)." Abstracts of the workshop **Continuous Optimization and Industrial Applications**, Oberwolfach, 9.1. - 15.1.2000.

11.20 "Topology design of structures, materials and mechanisms - an overview." Abstracts of the Workshop on **Optimization in solid and fluid mechanics**, Division of Mechanics, LiTH, Linköping, February 9-10, 2000.

11.21 "Grey-Scales in Topology Optimization: Hashin-Shtrikman Bounds and Realization by Composites." (with Ole Sigmund) **Abstracts of ICTAM2000**, Technical Report No. 950, Department of Theoretical and Applied Mechanics, University of Illinois at Urbana-Champaign, ISSN 0073-5264, 2000, p. 86.

11.22 "A Mutual Energy Formulation for the Design of Continuum Structures for Generalized Objective." (with J.E. Taylor) **Abstracts of ICTAM2000**, Technical Report No. 950, Department of Theoretical and Applied Mechanics, University of Illinois at Urbana-Champaign, ISSN 0073-5264, 2000, p. 9.

11.23 "Topology Optimization of Periodic Microstructures with a Penalization of Highly Localized Buckling Modes. " (with Miguel M. Neves and Ole Sigmund). **Abstracts of OPTY-2001**, Conference on mathematical and engineering aspects of optimal design of materials and structures, Poznan University of Technology, Poland, p.41.

11.24 "Mesh-Independent Geometry Models in Topology Optimization." (with R.B. Haber, J. Norato and D.A. Tortorelli) Proceedings of the **2nd Max Planck Workshop on Engineering Design Optimization**, Hotel Nyborg Strand, Nyborg, Denmark, October 12-14, 2001. Department of Mathematics, Technical University of Denmark, DK-2800 Lyngby, p. 85.

11.25 "A Material Optimization Model to Approximate Energy Bounds for Cellular Materials and Multiload Conditions." (with J. M. Guedes and H. Rodrigues) Proceedings of the **2nd Max Planck Workshop on Engineering Design Optimization**, Hotel Nyborg Strand, Nyborg, Denmark, October 12-14, 2001. Department of Mathematics, Technical University of Denmark, DK-2800 Lyngby, p. 119.

11.26 "Aspects of the design of microstructures by computational means." Abstracts of **International Conference on Homogenization**, Naples (Italy), June 18-27, 2001.

11.27 "Inverse Homogenization - On the Design of Periodic Composites." In Abstracts of SFB conference on **Computational Methods for Inverse Problems**, Strobl, Austria, 25-30 august, 2002.

11.28 "Optimization of Structures with Multiple Scales Using a Wavelet--Based Reduction Scheme." (with A. R. Diaz and S. Chellappa). Abstracts of **EUROMECH 442 Computer-Aided-Optimization of Mechanical Systems**, University of Erlangen-Nuremberg, Germany, February 23-27, 2003, p. 17.

11.29 "A Geometry Projection Method for Shape Optimization with Design-Dependent Boundary Loads." (with J. Norato, R. Haber and D. Tortorelli)) Abstracts of **Seventh U.S. National Congress on Computational Mechanics**, Albuquerque, New Mexico, USA, July 28-30, 2003.

11.30 "Topology optimization of structures or periodic solids with linearized elastic buckling criterion." (with M.M. Neves, H.C. Rodrigues, J.M. Guedes and O. Sigmund) Abstracts of **Seventh U.S. National Congress on Computational Mechanics**, Albuquerque, New Mexico, USA, July 28-30, 2003.

11.31 "Optimization with Multiple Scales Using Wavelet Based Reduced Order Models." (with A. R. Diaz and S. Chellappa). Abstracts of the **18th International Symposium on Mathematical Programming**, Copenhagen, Denmark, August 18-22, 2003, p. 60.

11.32 "A consistent geometry projection for shape and topology optimization." (with R.B. Haber, J. Norato and D.A. Tortorelli). Abstracts of **WISDOM 2004 - Warsaw International Seminar on Design and Optimal Modeling**, Warsaw, August 15th, 2004.

11.33 "A topological–derivative–based method for topology optimization." (with R.B. Haber, J. Norato and D.A. Tortorelli). Abstracts of **Eight U.S. National Congress on Computational Mechanics**, Austin, Texas, USA, July 25-27, 2005.

11.34 "Topology optimization using the finite volume method." (with A. Gersborg-Hansen and O. Sigmund) Abstracts **Third MIT Conference on Computational Fluid and Solid Mechanics**, MIT, Boston, USA, June 14-17, 2005.

11.35 "Implementing topology optimization using the finite volume method." (with A. Gersborg-Hansen and O. Sigmund) Abstracts of **International Workshop on "Direct and Inverse Field Computations in Mechanics"**, Linz, Austria, November 7 - 11, 2005.

11.36 "From relaxation to airplanes." Abstracts **Workshop on New Trends in Material Design of Complex Systems in Space and Time**, Worcester Polytechnic Institute, MA, USA, November 17 - 19, 2005.

11.37 "Optimal structural design with composites: free material and laminate design." (with M. Kocvara, E. Lund, M. Stingl, M. Stolpe, and J. Stegmann). Abtsracts of **6th European Solid Mechanics Conference**, ESMC 2006, 28 August – 1 September, 2006. 2 pages.

11.38 "Topology optimization of 3D Stokes flow problems." (with A. Gersborg-Hansen and O. Sigmund) Abstract of the **7th World Congress on Computational Mechanics**, Los Angeles, USA, July 16-22, 2006.

11.39 " Topology optimization applied to room acoustic problems and surface acoustic wave devices." (with M. B. Dühring, O. Sigmund, J. S. Jensen). Abstracts of **NanoDay**, Technical University of Denmark, Lyngby, Sept. 7, 2006

11.40 "Multidisciplinary Design Optimization". Abstracts of the **JSME 19th Computational Mechanics Conference**, Nagoya, Japan, Nov. 3-4, 2006
11.41 "Optimization of Thermal Aspects of Friction Stir Welding Using a Space Mapping Technique." (with Anders A. Larsen, Domenico Lahaye, Jesper Hattel and Henrik Schmidt). Abstracts of: **2nd GACM Colloquium on Computational Mechanics**. Technical University of Munich, 2007.

11.42 "Optimization of Thermal Aspects of Friction Stir Welding Using Space and Manifold Mapping Techniques." (with Anders A. Larsen, Domenico Lahaye, Jesper Hattel and Henrik Schmidt). Abstracts of **EuroMech Colloquium 482 Efficient Methods for Robust Design and Optimisation**. Queen Mary University of London, 2007.

11.43 "Design of the Resistance Welding Tool using Optimization Techniques." (with M. Bogomolny and J. Hattel). In Abstracts of **8th World Congress on Computational Mechanics WCCM8**, B. A. Schrefler and U. Perego (Eds.), Venice, Italy, 30 June - 4 July 2008. International Center for Numerical Methods in Engineering (CIMNE), Gran Capitán s/n, 08034 Barcelona, Spain, 2008.

11.44 "Approximate Reanalysis in Topology Optimization." (with O. Amir and O. Sigmund). In Abstracts of **8th World Congress on Computational Mechanics WCCM8**, B. A. Schrefler and U. Perego (Eds.), Venice, Italy, 30 June - 4 July 2008. International Center for Numerical Methods in Engineering (CIMNE), Gran Capitán s/n, 08034 Barcelona, Spain, 2008.

11.45 "Decomposition Techniques for Global Optimization of Discrete Topology Design Problems." (with E. Muñoz and M. Stolpe). In Abstracts of **8th World Congress on Computational Mechanics WCCM8**, B. A. Schrefler and U. Perego (Eds.), Venice, Italy, 30 June - 4 July 2008. International Center for Numerical Methods in Engineering (CIMNE), Gran Capitán s/n, 08034 Barcelona, Spain, 2008.

11.46 "Laminate interpretation of results from Free Material Optimization." (with M. Bogomolny and M. Stolpe). In Abstracts of **PLATO-N International Workshop**, Advances in Topology and Material Optimization - Methods and Industrial Applications, 2009, Technical University of Denmark, Kgs. Lyngby, Denmark.

12. Manuals

12.1 "OPTISHAPE-2D User's Manual." (with K.Suzuki, N.Kikuchi), Univ. of Michigan, MI, USA, 1988, 35 pp.

12.2 "OPTI-2D-TOPOLOGY-SHAPE, Users guide. Version 0.5, June 1989." (with H.C.Rodrigues) EEC-SCIENCE dokumentation, MAT -DTU, Lyngby, Denmark, 1989, 60 pp.

13. Reports

13.1 "Shelltheory for mathematicians." (in Danish) MAT-Report No. 69, DTU, Lyngby, Denmark, 1981, 40 pp.

13.2 "On the 2D-match of coaligned principal stresses and strains." (with P.Pedersen, J.Nagendra) Department of Solid Mechanics, DTU, Lyngby, Denmark, 8 pp.

13.3 "Aspects of Topology Optimization of Discrete and Continuum Structures" MAT-Report No. 1992-19, Department of Mathematics, Denmarks Tekniske Højskole, Lyngby, Denmark, 108 pp.

13.4 "Aspects of topology optimization and bone-remodelling schemes." A web publication (pdf-file), published on the ISSMO WG *OPTIMIZATION IN BIOMECHANICS* homepage, see www.issmo.org. 16 pp.

POPULARIZING SCIENCE

14.1 "Generating Optimal Topologies in Structural Design Using a Homogenization Method." (with N.Kikuchi) Annual Report 1987/88, Mechanical Engineering and Applied Mechanics, College of Engineering, The University of Michigan, pp. 30-32.

14.2 "Topology Optimization of Structures." **ECMI Newsletter**, No. 11 (1992), pp. 15-17.

14.3 "Optimering af konstruktioners topologi, form og materiale." Villum Kann Rasmussen Fondens Årsrapport, 1998, 5 pp.

14.4 "Optimization of structural topology, shape, and materials." (with Ole Sigmund) A Web tutorial at the address http://www2.mat.dtu.dk/people/M.P.Bendsoe/topology.html.

14.5 "Optimering af konstruktioners topologi, form og materiale." (med Ole Sigmund) In *Forskning: Konstruktioner og eksperiment* (Erik Reitzel, P.Duelund Mortensen, eds.), Kunstakademiets Arkitektskole 1998, pp. 16-19.

14.6 "Matematik er teknikkens sprog." i M. Niss (Ed.): Matematik i verden. Forlaget Fremad, 2001.

14.7 "Computeren designer." i Rolf Haugaard Nielsen (Ed.): VIDENSKABERFREMTIDEN. Villum Kann Rasmussen Fonden og Experimentarium, 2003, pp. 122-129.

14.8 "OPTIMERING -- computeren finder vej til den bedste konstruktion." PERSPEKTIV, 2. årgang, Nr. 3, Oktober 2003, pp. 4-5.

14.9 "Topology optimization -- from airplanes to nanooptics." (with O. Sigmund). In BRIDGING from technology to society (K. Stubkjær and T. Kortenbach, Eds.), Technical University of Denmark, Lyngby, Denmark, 2004, pp. 40-51.

14.10 " Større frihed giver højere kvalitet – om designoptimering med computeren." I Antologi i anledning af 100 års-dagen for Villum Kann Rasmussen, Villum Kann Rasmussen Fonden, 2009, 12 pp.

TEACHING MATERIALS

Textbooks

15.1 "Kontrollerbarhed og observerbarhed af lineære og ikke-lineære systemer." MAT-DTU, Lyngby, Denmark, 1981. 193 pp.

15.2 "Lineær algebra - Datamatorienteret." Første udgave. Bind 1, 204 pp. Bind 2, 175 pp. (Med P.S.Hansen og H.Bruun Nielsen) MAT-NI-DTU, Lyngby, Denmark, 1986.

15.3 "Matematisk Analyse 3." (Med W. Kliem) MAT-DTU, Lyngby, Denmark, 1994. 231 pp. 2. udgave, 1995. 3. udgave 2000.

Other publications

16.1 "Om endelig bestemte kim; Nogle algebraiske metoder i singularitetsteori." Department of Mathematics, Københavns Universitet, 1979, 23 pp.

16.2 "Om simpel kontrol." MAT-PR nr. 1, DTU, Lyngby, Denmark, 1979, 17 pp.

16.3 Proc. 7th Nordic Conference on the Teaching of Mathematics at Technical Universities (edited with T.Høholdt) Mathematical Institute, The Technical University of Denmark, 1987, 90 pp.

16.4 "Opgaver, Matematisk Analyse 3." Første udgave (Med O. Brændstrup og W. Kliem) MAT-DTU, Lyngby, Denmark, 1994. 58 pp. 2. udgave, 1996, 75 pp.

16.5 "Køreplaner - Projektopgaver - Matematik 1, F2002" (Redaktør) MAT-DTU, Lyngby, Denmark, 2002, 120 pp.

16.6 "Matematik - en erfaringsopsamling af udviklingsarbejder og forsøg i det almene gymnasium." (med Bodil Bruun, Sven Toft Jensen, Kjeld Bagger Laursen og Olav Lyndrup). Udviklingsprogrammet for fremtidens ungdomsuddannelser, Hæfte nr. 28, Uddannelsesstyrelsen, Januar 2003, 33 pp.

16.7 "Køreplaner - Projektopgaver - Matematik 1, F2003" (Redaktør) MAT-DTU, Lyngby, Denmark, 2003, 80 pp.