Bibliography

[1] M. Aisling et al. Anisotropic elastic properties of cancellous bone from a human edentulous mandible. In *Proc. of ASME Bioengineering'99 Conference*, 1999.

[2] I. Babuska and A. K. Aziz. On the angle condition in the finite element method. *SIAM Journal on Numerical Analysis*, 13:214–226, 1976.

[3] R. Bajcsy and C. Broit. Matching of deformed images. In *Proc. 6-th Int. Conf. on Pattern Recognition*, pages 351–353, München, 1982.

[4] R. Bajcsy and S. Kovačič. Multiresolution elastic matching. *Computer Vision, Graphics, and Image Processing*, 46:1–21, 1989.

[5] A. H. Barr. Global and local deformations of solid primitives. In *Proc. of SIGGRAPH'84*, 1984.

[6] R. Bartels, J. Beatty, and B. Barsky. *An Introduction to Splines for use in Computer Graphics and Geometric Modeling*. Morgan Kaufmann, Los Altos, 1987.

[7] P. I. Begun and J. A. Shukeilo. *Biomechanics (in russian)*. Polytechnika. ISBN 5732503095, St.Petersburg, 2000.

[8] D. E. Beskos. *Boundary Element Methods in Mechanics*. North-Holland, Amsterdam, 1987.

[9] F. L. Bookstein. Principal warps: Thin-plate splines and the decomposition of deformations. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 11(6):567–585, 1989.

[10] F. A. Bornemann, B. Erdmann, and R. Kornhuber. Adaptive multilevel-methods in three space dimensions. *Int. J. for Numer. Meth. in Eng.*, 36:3187–3203, 1993.

[11] D. Braess. *Finite Elemente: Theorie, schnelle Löser und Anwendungen in der Elastizitätstheorie*. Springer, Berlin, 1997.

[12] C. A. Brebia. *Boundary Element Techniques*. Springer, Berlin, 1984.

[13] M. Bro-Nielsen. Fast finite elements for surgery simulation. In *Proc. of Medicine Meets Virtual Reality 5 (MMVR-5'97)*, 1997.

[14] M. Bro-Nielsen and S. Cotin. Real-time volumetric deformable models for surgery simulation using finite elements and condensation. In *Proc. of Eurographics'96 Conference*, volume 15, pages 57–66, 1996.

[15] C. Broit. *Optimal Registration of Deformed Images*. PhD thesis, University of Pennsylvania, 1981.

[16] D. Cebon and M. F. Ashby. Materials selection for precision instruments. *Meas. Sci. and Technol.*, 5:296–306, 1994.

[17] Y. Chang and A. P. Rockwood. A generalized de casteljau approach to 3D free-form deformation. In *Proc. of SIGGRAPH'94 Conference*, 1994.

[18] D. T. Chen and D. Zeltzer. Pump it up: Computer animation of a biomechanically based model of muscle using the finite element method. *Computer Graphics*, 26:89–98, 1992.

[19] G. E. Christensen. *Deformable Shape Models for Anatomy*. PhD thesis, Washington University, August 1994.

[20] P. G. Ciarlet. *The Finite Element Method for Elliptic Problems*, volume 4 of *Studies in Mathematics and its Applications*. North-Holland, Amsterdam, 1978.

[21] P. G. Ciarlet. *Mathematical Elasticity. Volume I: Three-Dimensional Elasticity*, volume 20 of *Studies in Mathematics and its Applications*. North-Holland, Amsterdam, 1988.

[22] S. Coquillart. Extended free-form deformation: A sculpturing tool for 3D geometric modeling. In *Proc. of SIGGRAPH'90 Conference*, 1990.

[23] S. Cotin, H. Delingette, and N. Ayache. Real time volumetric deformable models for surgery simulation. In *Proc. of VBC'96 Conference*, 1996.

[24] M. A. Crisfield. *Non-linear Finite Element Analysis of Solids and Structures*. John Wiley & Sons, Chichester, 1991.

[25] DAVID. Online atlas of human anatomy for clinical imaging diagnosis. URL: `http://www.cid.ch/DAVID/Mainmenu.html`.

[26] M. H. Davis. *Deformable Matching of 3D Medical Images*. PhD thesis, Southern Methodist University, May 1996.

[27] H. Delingette. Towards realistic soft tissue modeling in medical simulation. rapport de recherche no 3506. Technical report, INRIA, Le Chesnay Cedex, 1998.

[28] X. Deng. *A Finite Element Analysis of Surgery of Human Facial Tissues*. PhD thesis, Columbia University, 1988.

[29] P. Deuflhard. A modifi ed Newton method for the solution of ill-conditioned systems of nonlinear equa tions with application to multiple shooting. *Numer. Math.*, 22:289–315, 1974.

[30] P. Deuflhard and A. Hohmann. *Numerische Mathematik I*. Walter de Gruyter, Berlin, 2002.

[31] P. Deuflhard, P. Leinen, and H. Yserentant. Concepts of an adaptive hierarchical fi nite element code. *Impact of Computing in Science and Engineering*, 1:3–35, 1989.

[32] P. Deuflhard and M. Weiser. Local inexact Newton multilevel FEM for nonlinear elliptic problems. In M.-O. Bristeau, G. Etgen, W. Fitzgibbon, J. Lions, J.-L. a nd Periaux, and M. Wheeler, editors, *Computational science for the 21st century*, pages 129–138. Wiley, 1997.

[33] P. Deuflhard and M. Weiser. Global inexact Newton multilevel FEM for nonlinear elliptic problems. In W. Hackbusch and G. Wittum, editors, *Multigrid Methods V*, Lecture Notes in Computational Science and Engineering, pages 71–89. Springer, 1998.

[34] F. Duck. *Physical properties of tissues: a comprehensive reference book*. Academic Press, London, 1991.

[35] P. Ekman and W. Friesen. *Unmasking the Face. A Guide to Recognizing Emotions From Facial Clues*. Prentice-Hall, Englewood Cliffs, New Jersey, 1975.

[36] B. Erdmann, J. Lang, and R. Roitzsch. KASKADE manual version 2.0: FEM for 2 and 3 space dimensions. Technical report, Zuse Institute Berlin (ZIB), Berlin, 1993.

[37] R. Q. Erkamp, P. Wiggins, A. R. Skovoroda, S. Emelianov, and M. O'Donnell. Measuring the elastic modulus of small tissue samples. *Ultrasonic Imaging*, 20:17–28, 1998.

[38] H. Eschenauer and W. Schnell. *Elastizitätstheorie*. B.I. Wissenschaftsverlag, Mannheim, 1993.

[39] Famous3D. Facial animation solutions. URL: `http://www.famous3D.com`.

[40] M. Ferrant, S. K. Warfield, C. R. G. Guttmann, R. V. Mulkern, F. A. Jolesz, and Kikinis R. 3D image matching using a finite element based elastic deformation model. In *Proc. of MICCAI'99 Conference*, 1999.

[41] SimBio: A Generic Enviromet for Bio-numerical Simulation. Material database design report. URL: `http://www.simbio.de`.

[42] O. Forster. *Analysis 3. Integralrechnung im IRn mit Anwendungen*. Vieweg, Braunschweig, 1984.

[43] P. Frey and H. Borouchaki. Delaunay tetrahedralization using an advancing-front approach. In *Proc. of 5th International Meshing Roundtable, SAND'96*, 1996.

[44] Y. C. Fung. *Biomechanics - Mechanical Properties of Living Tissues*. Springer, Berlin, 1993.

[45] P. L. George and H. Borouchaki. *Delaunay Triangulation and Meshing*. Hermes, Paris, 1998.

[46] P. Germain. *Mecanique des Milleux Continus (russian edition)*. MIR, Moscow, 1965.

[47] S. F. F. Gibson and B. Mirtich. A survey of defomable modeling in computer graphics. TR-97-19. Technical report, Mitsubishi Electric Research Laboratory, Cambridge, 1997.

[48] E. Gladilin. Theoretische und experimentelle Untersuchung der linearelastischen Randelementemethode zur elastischen Registrierung medizinischer Bilder. Master's thesis, Universität Hamburg, Juli 1999.

[49] E. Gladilin, W. Peckar, K. Rohr, and H. S. Stiehl. A comparsion between BEM and FEM for elastic registration of medical images. TR FBI-HH-M-287/99. Technical report, FB Informatik, Hamburg University, Hamburg, 1999.

[50] E. Gladilin, S. Zachow, P. Deufhard, and H.-C. Hege. Validation of a linear elastic model for soft tissue prediction in craniofacial surgery. In *Proc. of SPIE Medical Imaging Conference*, volume 4319, pages 27–35, San Diego, USA, 2001.

[51] E. Gladilin, S. Zachow, P. Deufhard, and H. C. Hege. Adaptive nonlinear elastic FEM for realistic prediction of soft tissue in craniofacial surgery simulations. In *Proc. of SPIE Medical Imaging Conference*, San Diego, USA, 2002.

[52] E. Gladilin, S. Zachow, P. Deufhard, and H. C. Hege. Shape-based approach for the estimation of individual facial mimics in craniofacial surgery planning. In *Proc. of SPIE Medical Imaging Conference*, San Diego, USA, 2002.

[53] D. Guoy. Sink-insertion for mesh improvement. URL: `http://www.cse.uiuc.edu/~guoy/sink/`.

[54] E. Haug. Biomechanical models in vehicle accident simulation. In *Proc. of PAM'95 Conference*, 1995.

[55] H. C. Hege, M. Seebaß, D. Stalling, and M. Zöckler. Generalized marching cubes algorithm based on non-binary classifi cations. ZIB preprint SC-97-05. Technical report, Zuse-Institute-Berlin (ZIB), Berlin, 1997.

[56] D. Helm. Untersuchung der EAS-formulierung fr nahezu inkompressible gummiartige materialien bei fi niten deformationen. Master's thesis, Universität Kassel, 1994.

[57] M. Hestenes and E. Stiefel. Methods of conjugate gradients for solving linear systems. *J. Res. NBS*, 49:409–436, 1952.

[58] A. V. Hill. The force-velocity relation in shortening muscle. fi rst and last experiments in muscle mechanics. *Cambridge at the University Press*, 3, 1970.

[59] N. Ng Hing and R. Grimsdale. Computer graphics techniques for modeling cloth. *IEEE Computer Graphics and Applications*, 16:28–41, 1996.

[60] K. H. Höhne and R. Berstein. Shading 3D-images from CT using gray level gradients. *IEEE Trans. on Medical Imaging*, 5:45–47, 1986.

[61] G. A. Holzapfel. *Nonlinear Solid Mechanics*. John Wiley & Sons, Chichester, 2000.

[62] The human head. A resource for 3D modelers. URL: `http://www.erc.msstate.edu/~camen/thehumanhead/`.

[63] Diels H. J. New concepts in nonsurgical facial nerve rehabilitation. *Advances in Otolaryngology-Head and Neck Surgery*, 9:289–315, 1995.

[64] D. L. James. *Multiresolution Green's Function Methods for Interactive Simulation of Large-scale Elastostatic Objects and other Physical Systems in Equilibrium*. PhD thesis, UBC, 2001.

[65] D. L. James and D. K. Pai. ARTDEFO: Accurate real time deformable objects. In *Proc. of SIGGRAPH'99 Conference*, 1999.

[66] P. Kalra, A. Mangili, N. Magnenat Thalmann, and D. Thalmann. Simulation of facial muscle actions based on rational free form deformations. In *Proc. of Eurographics'92 Conference*, 1992.

[67] M. Kass, A. Witkin, and D. Terzopoulos. Snakes: Active contour models. *Int. Journal of Computer Vision*, 1:321–331, 1988.

[68] M. Kauer. *Inverse Finite Element Characterization of Soft Tissues with Aspiration Experiments, Diss. No. 14233*. PhD thesis, ETHZ, 2001.

[69] E. Keeve, S. Girod, and B. Girod. Craniofacial surgery simulation. In *Proc. of VBC'96 Conferece*, pages 541–546, 1996.

[70] R. M. Kenedi, T. Gibson, J. H. Evans, and J. C. Barbenel. Tissue mechanics. *Phys. Med. Biol.*, 20:699–717, 1975.

[71] R. M. Koch, M. H. Gross, and A. A. Bosshard. Ein FEM-basierter Mimikgenerator für animierte anthropomorphe Avatare. In *Proc. of AAA'97 Conference*, volume 3, pages 31–40, 1997.

[72] R. M. Koch, M. H. Gross, and A. A. Bosshard. Emotion editing using finite elements. In*Proc. of Eurographics'98 Conference*, volume 17, pages 295–302, 1998.

[73] R. M. Koch, M. H. Gross, F. R. Carls, D. F. von Bren, and Y. I. H. Parish. Simulating facial surgery using finite element models. In *Proc. of SIGGRAPH'96 Conference*, pages 421–428, 1996.

[74] R. M. Koch, S. H. M. Roth, M. H. Gross, A. P. Zimmermann, and H. F. Sailer. A framework for facial surgery simulation. technical report no. 326. Technical report, Computer Science Department, ETHZ, Zürich, 1999.

[75] R. H. Krause. *Monotone Multigrid Methods for Signorini's Problem with Friction*. PhD thesis, FU Berlin, 2001.

[76] R. D. Kriz. Microstructure lestures. Technical report. Department of Engineering Science and Mechanics, Virginia Polytechnic Institute and State University, 2000.

[77] L. D. Landau and E. M. Lifschitz. *Elastizitätstheorie*. Akademie-Verlag, Berlin, 1989.

[78] P. S. Laplace. *Philosophical Essay on Probabilities*. Springer, Berlin, 1995.

[79] Y. Lee, D. Terzopoulos, and K. Waters. Realistic modeling for facial animation. In *Proc. of SIGGRAPH'95 Conference*, 1995.

[80] V. D. Liseikin. *Grid Generation Methods*. Springer, Berlin, 1999.

[81] H. Maass. *Untersuchung einer Methode zur nichtinvasiven Messung von Steifigkeitskoeffizienten an lebendem Gewebe mit multimodalen bildgebenden Verfahren*. PhD thesis, Universität Karlsruhe, März 1999.

[82] N. Magnenat-Thalmann, N. E. Primeau, and D. Thalmann. Abstract muscle actions procedures for human face animation. *Visual Computer*, 3:290–297, 1988.

[83] G. E. Mase. *Theory and Problems of Continuum Mechanics*. McGraw Hill, New York, 1970.

[84] Y. Masutani et al. A new modal representation of liver deformation for non-rigid registration in image-guided surgery. In *Proc. of CARS'01 Conference*, pages 19–24, 2001.

[85] W. Maurel, Y. Wu, N. Magnenat Thalmann, and D. Thalmann. *Biomechanical Models for Soft Tissue Simualtion*. Springer, Berlin, 1998.

[86] T. McInerny and D. Terzopoulos. Deformable models in medical image analysis: a survey. *Medical Image Analysis*, 1:91–108, 1996.

[87] D. N. Metaxas. *Physics-based deformable models*. Kluwer Academic Publishers, Boston, 1997.

[88] C. Monserrat, V. Hernndez, M. Alcaiz, MC. Juan, and V. Grau. Evaluation and study of a new deformable model based on boundary element methods. In *Proc. of CARS'99 Conference*, 1999.

[89] V. Ng-Thow-Hing. *Anatomically-based models for physical and geometric recontruction of humans and other animals*. PhD thesis, University of Toronto, 2001.

[90] N. Özkaya and Nordin M. *Fundamentals of Biomechanics*. Springer, Berlin, 1999.

[91] F. I. Parke. Computer generated animation of faces. Master's thesis, University of Utah, UTEC-CSc-72-120, 1972.

[92] F. I. Parke. A model for human faces that allows speech synchronized animation. *Computers and Graphics*, 1:1–4, 1975.

[93] F. I. Parke and K. Waters. *Computer Facial Animation*. A K Peters, Wellesley, 1996.

[94] M. Patel. *Making FACES*. PhD thesis, University of Bath, 1991.

[95] W. Peckar, C. Schnörr, K. Rohr, and H.S. Stiehl. Parameter-free elastic deformation approach for 2-D and 3-D registration using prescribed displacements. *Journal of Mathematical Imaging and Vision*, 10(2):143–162, 1999.

[96] K. Pelachaud, N. I. Badler, and M. L. Viaud. Final report of the standards for facial animation workshop, october 1994. URL: `http://www.cis.upenn.edu`.

[97] A. Pentland et al. Closed-form solutions for physically based shape modeling and recognition. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, PAMI-13(7):715–729, 1991.

[98] C. Peskin and D. McQueen. A three-dimensional computational method for blood fbw in the heart.immersed elastic fi bers in a viscous incompressible fluid. *Journal of Computational Physics*, 81:372–405, 1989.

[99] G. Picinbono, H. Delingette, and N. Ayache. Real-time large displacement elasticity for surgery simulation: Non-linear tensor-mass model. In *Proc. of MICCAI'00 Conference*, pages 643–652, Pittsburgh, 2000.

[100] S. D. Pieper. *CAPS: Computer-Aided Plastic Surgery*. PhD thesis, M.I.T, Cambridge, 1991.

[101] S. Platt and N. Badler. Animating facial expressions. *Computer Graphics*, 15:245–252, 1981.

[102] K. Rohr et al. Point-based elastic registration of medical image data using approximating thin-plate splines. In *Proc. of VBC'96 Conference*, volume 1131 of *Lecture Notes in Computer Science*, pages 297–306, Hamburg, September 1996. Springer.

[103] S. H. M. Roth, M. H. Gross, S. Turello, and F. R. Carls. A bernstein-bzier based approach to soft tissue simulation. In *Proc. of Eurographics'98 Conference*, volume 17, pages 285–294, 1998.

[104] A. Samani, J. Bishop, E. Ramsay, and D. Plewes. A 3D contact problme fi nite element model for breast shape deformation derived from mri data. In *Proc. of ASB'99 Annual Conference*, 1999.

[105] A. Sarti, L. Gori, and C. Lamberti. A physically based modell to simulate maxillo-facial surgery from 3D CT images. *Future Generation Computer Systems (FGCS)*, 15:217–221, 1999.

[106] F. Scheepers, R. E. Parent, W. E. Carlson, and S. F. May. Anatomy-based modeling of the human musculature. In *Proc. of SIGGRAPH'97 Conference*, 1997.

[107] T. Schiemann. *Interaktive Verfahren für deformierende Eingriffe an volumenbasierten digitalen Körpermodellen*. PhD thesis, Technische Universität Hamburg-Harburg, Juli 1998.

[108] J. A. Schnabel et al. Validation of non-rigid registration using fi nite element methods. In *Proc. of IPMI'01 Conference*, pages 344–357, 2001.

[109] H. R. Schwarz. *Methode der fi niten Elemente*. Teubner, Stuttgart, 1984.

[110] T. W. Sederberg and S. R. Parry. Free-form deformation of solid geometric models. In *Proc. of SIGGRAPH'86*, 1986.

[111] J. R. Shewchuck. Lecture notes on delaunay mesh generation. URL: `http://citeseer.nj.nec.com/shewchuk99lecture.html`.

[112] D. Stalling, M. Zöckler, and H.-C. Hege. Amira - an advanced 3D visualization and modeling system. URL: `http://amira.zib.de`.

[113] D. Terzopoulos and K. Waters. Physically based facial modeling, analysis and animation. In *Proc. of Visualisation and Computer Animation*, volume 1, pages 73–80, 1990.

[114] M. Teschner. *Direct Computation of Soft-Tissue Deformation in Craniofacial Surgery*. PhD thesis, Universität Erlangen-Nürnberg, Oktober 2000.

[115] K. Waters. A muscle model for animating three-dimensional facial expression. In *Proc. of SIGGRAPH'87 Conference*, pages 17–24, 1987.

[116] K. Waters. *The Computer Synthesis of Expressive Three-Dimensional Facial Character Animation*. PhD thesis, Middlesex University, June 1988.

[117] X. Wu, M. S. Downes, T. Goktekin, and F. Tendick. Adaptive nonlinear finite elements for deformable body simulation using dynamic progressive meshes. In *Proc. of Eurographics'01 Conference*, volume 20, 2001.

[118] S. Zachow, E. Gladilin, H. C. Hege, and P. Deuflhard. Towards patient specific, anatomy based simulation of facial mimics for surgical nerve rehabilitation. In *Proc. of CARS'02 Conference*, Paris, France, 2002.

[119] S. Zachow, E. Gladilin, H.-F. Zeilhofer, and R. Sader. Improved 3d osteotomy planning in cranio-maxillofacial surgery. In *Proc. of MICCAI'01 Conference*, Utrecht, Netherlands, 2001.

[120] F. E. Zajac. Muscle and tendon: Properties, models, scaling, and application to biomechanics and motor control. *Critical Reviews in Biomedical Engineering*, 17:359–411, 1989.

[121] Y. Zheng, F. T. Arthur, and L. Bokong. Objective assessment of limb tissue elasticity: Development of a manual indentation procedure. *Journal of Rehabilitation Research and Development*, 36, 1999.

[122] Q. Zhu, Y. Chen, and A. Kaufman. Real-time biomechanically-based muscle volume deformation using FEM. In *Proc. of Eurographics'98 Conference*, volume 17, 1998.