

HONG QIN

Work Address

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State University of New York at Stony Brook
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- Major Research Interests**
- Computer Graphics
 - Geometric and Physics-Based Modeling
 - Computer Aided Design
 - Computer Integrated Manufacturing
 - Computer Aided Geometric Design
 - Virtual Environments
 - Virtual Engineering
 - Animation, Simulation, and Robotics

- Other Research Interests**
- Finite Element Analysis and Numerical Methods
 - Visualization, Vision, and Medical Imaging
 - User Interaction and Human-Computer Interface
 - Scientific Computing
 - Applied Mathematics

- Teaching Interests**
- Computer Graphics
 - Geometric and Physics-Based Modeling
 - Computer Aided Design
 - Virtual Reality
 - Scientific Visualization
 - Computer Animation and Simulation
 - Numerical Techniques and Analysis

Education **Ph.D., University of Toronto, 1995** Toronto, Canada
Doctor of Philosophy in Computer Science, specializing in Computer Graphics and Geometric Modeling (September, 1995). Thesis Title: *D-NURBS: Dynamic Non-Uniform Rational B-Splines*. Thesis Supervisor: Professor Demetri Terzopoulos (Computer Science, University of Toronto).

M.Sc., Peking University, 1989 Beijing, P.R. China
Master of Science in Computer Science (July, 1989). Thesis Title: *Optimal Algorithm and Software Implementation of Structural Analysis for Biological Molecules*.

Thesis Supervisor: Professor Gong-Ben Wang (Computer Science, Peking University).

B.Sc., Peking University, 1986 Beijing, P.R. China
Bachelor of Science in Computer Science (July, 1986). Thesis Title: *Initiative Research on GO Expert System*. Thesis Supervisor: Professor Gong-Ben Wang (Computer Science, Peking University).

Professional Experience STATE UNIVERSITY OF NEW YORK AT STONY BROOK, DEPARTMENT OF COMPUTER SCIENCE Stony Brook, New York, USA
[September, 2001 – present]
Associate professor in computer science.

STATE UNIVERSITY OF NEW YORK AT STONY BROOK, DEPARTMENT OF COMPUTER SCIENCE Stony Brook, New York, USA
[September, 1997 – August, 2001]
Assistant professor in computer science.

UNIVERSITY OF FLORIDA, DEPARTMENT OF COMPUTER AND INFORMATION SCIENCE AND ENGINEERING Gainesville, Florida, USA
[January, 1996 – October, 1997]
Assistant professor in computer & information science & engineering.

UNIVERSITY OF TORONTO, DEPARTMENT OF COMPUTER SCIENCE Toronto, Canada
[September, 1995 – December, 1995]
Research scientist and postdoctoral fellow in computer science.

UNIVERSITY OF TORONTO, DEPARTMENT OF COMPUTER SCIENCE Toronto, Canada
[September, 1991 – September, 1995]
Ph.D. candidate in computer science. Research assistant in computer science.
Teaching assistant in undergraduate and graduate computer science courses.

UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL, DEPARTMENT OF COMPUTER SCIENCE Chapel Hill, North Carolina, USA
[August, 1990 – August, 1991]
Ph.D. candidate in computer science. Research assistant in computer science.
Teaching assistant in graduate computer science courses.

NORTH-CHINA INSTITUTE OF COMPUTING TECHNOLOGY Beijing, P.R. China
[July, 1989 – August, 1990]
Research scientist and senior engineer in computer network and telecommunication.

PEKING UNIVERSITY, DEPARTMENT OF COMPUTER SCIENCE Beijing, P.R. China
[September, 1986 – June, 1989]
Research assistant in computer science. Teaching assistant in graduate computer science courses.

Honors and Awards

Alfred P. Sloan Research Fellow, 2001 – 2003.

Honda Initiation Grant Award, 2001.

NSF ITR Grant Award, National Science Foundation (NSF), 2000 – 2003.

NSF CAREER Award, National Science Foundation (NSF), 1997 – 2001.

University of Toronto Open Doctoral Fellowship, 1991 – 1993.

International Student Differential Fee Waiver Scholarship, University of Toronto, 1991 – 1993.

Best Graduate Award, Peking University, Beijing, 1986.

Honor Student Award, Peking University, Beijing, 1983 – 1985.

Silver Medal of National High School Mathematics Competition, Beijing, 1982.

Bronze Medal of Metro-Beijing Junior High School Mathematics Competition, Beijing, 1980.

Grants

Co-Principal Investigator, “ITR: Intelligent Deformable Models,” National Science Foundation, \$1,240,000, September 2003 to August 2007 (a collaborative research project among SUNY at Stony Brook, New York University, Stanford University, and UCLA, with Demetri. Terzopoulos from New York University as PI, Ronald Fedkiw from Stanford University and Stanley Osher from UCLA as another two co-PIs).

Principal Investigator, “Visualization/MASSIVE: Multiresolution, Adaptive, Subdivision Surfaces for Interactive Visualization and Exploration,” National Science Foundation, \$350,002, (additional \$36,000 university matching fund from SUNY at Stony Brook), September 2003 to August 2006.

Principal Investigator, “Parallel Software Development for BNL Aerosol Chemical Transport and Transformation Model,” Brookhaven National Laboratory, \$27,062, November 2001 to October 2002.

Principal Investigator, “Parallel Computation Techniques and System Development for Chemical Transport Modeling and Simulation,” Brookhaven National Laboratory, \$15,432, May 2001 to November 2001.

2001 Sloan Research Fellowship, \$40,000, September 2001 to September 2003.

Principal Investigator, “A Haptics-Based Interface and Interactive Sculpting System for Virtual Environments,” National Science Foundation, \$546,446, (additional \$100,000 university matching fund from SUNY at Stony Brook), July 2001 to June 2004.

Principal Investigator, “Novel Engineering Design Techniques for the Next-Generation, Integrated CAE/CAD/CIM in Automobile Industry,” Sensor CAT of New York State, \$8,000, January 2001 to December 2001.

Principal Investigator, “Physics-Based Technology and System for the Next-Generation, Integrated CAE/CAD/CIM,” Honda Initiation Grant Award, \$30,000, January 2001 to December 2001 (also see <http://research.honda.com>).

Principal Investigator, “ITR/HCI: An Interactive Graphical Modeling System based on Dynamic Subdivision Splines,” National Science Foundation Information Technology Research (ITR) Initiative, \$450,000, (additional \$55,096 university matching fund from SUNY at Stony Brook), September 2000 to August 2003.

Software Gift Donation from Structural Dynamics Research Corporation (SDRC), SDRC I-DEAS software system, \$158,000 per user, 28 simultaneous users, total \$4,424,000 to SUNY at Stony Brook.

Principal Investigator, “Graphical Modeling, Statistical Analysis, and Visualization of Large Warehouse Datasets,” SUNY SPIR program and Robocom Systems International, \$26,167, January 2000 to July 2000 (with Dr. Ye from AMS of SUNY at Stony Brook).

Principal Investigator, “A Software Tool for Graphical Understanding and Decision Making in Large Warehouse Datasets,” SUNY SPIR program and Robocom Systems International, \$38,496, June 2000 to December 2000 (with Dr. Ye from AMS of SUNY at Stony Brook).

Principal Investigator, “Physics-Based Computer Aided Geometric Design: Theory and Applications,” National Science Foundation CAREER Award, \$230,000, May 1997 to May 2001.

Principal Investigator, “A Physics-Based Geometric Modeling and Design System,” National Science Foundation Research Grant, \$271,000, January 1997 to January 2000.

Principal Investigator, “An Interactive, Physics-Based, Computer-Integrated Design Environment for Automotive CAD/CAM/CAE,” Ford Motor Company, \$37,500, May 1997 to May 1999.

Journal Publications “A Shape Design System Using Volumetric Implicit PDEs,” H. Du and H. Qin, *Computer Aided Design*, 2003, accepted, special issue of Solid Modeling 2003.

“Enhancing Interactive Editing on Point Set Surfaces Through Touch-based Haptics,” X. Guo, J. Hua, and H. Qin, *IEEE Computer Graphics and Applications*, 2003, under review.

“HapticFlow: Direct Manipulation of Polygonal Objects with Haptics,” Y. Duan, J. Hua, and H. Qin, *IEEE Computer Graphics and Applications*, 2003, under review.

“Interpolatory, Solid Subdivision of Unstructured Hexahedral Meshes,” K.T. McDonnell, Y. Chang, and H. Qin, *The Visual Computer*, under review.

“Haptics-based Dynamic Implicit Solid Modeling,” J. Hua and H. Qin, *IEEE Transactions on Visualization and Computer Graphics*, 2003, accepted.

- “Scalar-Field Guided Adaptive Shape Deformation and Animation,” J. Hua and H. Qin, *The Visual Computer*, 2003, in press.
- “DYNASOAR: DYNAMIC Solid Objects of Arbitrary topology,” K.T. McDonnell and H. Qin, *ACM Transactions on Graphics*, 2002, under review.
- “Dynamic PDE Surface Design Using Geometric and Physical Constraints,” H. Du and H. Qin, *Graphical Models*, 2003, accepted.
- “Dynamic Sculpting and Animation of Free-form Subdivision Solids,” K.T. McDonnell and H. Qin, *The Visual Computer*, **18**(2): 81–96, March, 2002.
- “A Novel Optimization Approach to The Effective Computation of NURBS Knots,” H. Xie and H. Qin, *International Journal of Shape Modeling*, **7**(2): 199–227, December, 2001 (Special Issue on the International Conference on Shape Modeling and Applications - SMI2001).
- “A Novel Haptics-Based Interface and Sculpting System for Physics-Based Modeling and Design,” F. Dachille, H. Qin, and A. Kaufman, *Computer Aided Design*, **33**(5): 403–420, April, 2001.
- “A Novel FEM-Based Dynamic Framework For Subdivision Surfaces,” C. Mandal, H. Qin and B.C. Vemuri, *Computer Aided Design*, **32**(8&9): 479–497, 2000 (Special Issue on Solid Modeling).
- “Dynamic Modeling of Butterfly Subdivision Surfaces,” C. Mandal, H. Qin and B.C. Vemuri, *IEEE Transactions on Visualization and Computer Graphics*, **6**(3): 265–287, July-September, 2000 (earlier version also available UFL-CISE Technical Report TR98-009).
- “Dynamic Catmull-Clark Subdivision Surfaces,” H. Qin, C. Mandal and B.C. Vemuri, *IEEE Transactions on Visualization and Computer Graphics*, **4**(3): 215–229, July-September, 1998.
- “Triangular NURBS and Dynamic Generalizations,” H. Qin and D. Terzopoulos, *Computer Aided Geometric Design*, **14**(4): 325–347, 1997.
- “Physics-Based Geometric Design,” H. Qin, *International Journal of Shape Modeling*, **2**(2&3): 139–188, 1996.
- “D-NURBS: A Physics-Based Geometric Design Framework,” H. Qin and D. Terzopoulos, *IEEE Transactions on Visualization and Computer Graphics*, **2**(1): 85–96, March, 1996.
- “Dynamic NURBS Swung Surfaces for Physics-Based Shape Design,” H. Qin and D. Terzopoulos, *Computer Aided Design*, **27**(2): 111-127, February, 1995.
- “Dynamic NURBS with Geometric Constraints for Interactive Sculpting,” D. Terzopoulos and H. Qin, *ACM Transactions on Graphics*, **13**(2): 103–136, April, 1994.
- “The Program and Algorithm for Optimal Biological Sequence Alignment,” H. Qin and G. Wang, *Acta Scientiarum Naturalium Universitatis Pekinensis*, **27**(1): 51–60, January, 1991.

- Conference Publications** “2.5D Active Contour for Surface Reconstruction,” Y. Duan and H. Qin, *The Eighth Fall Workshop on Vision, Modeling, and Visualization (VMV 2003)*, Munich, Germany, November 19-21, 2003, to appear.
- “Shape Design, Reconstruction, and Manipulation Using Volumetric Implicit PDEs,” (abstract), H. Du and H. Qin, *Eighth SIAM Conference on Geometric Design and Computing (SIAM-GD’03)*, Seattle, Washington, November 10-13, 2003.
- “Sketch-based Adaptive Free-Form Deformation,” (abstract), J. Hua and H. Qin, *Eighth SIAM Conference on Geometric Design and Computing (SIAM-GD’03)*, Seattle, Washington, November 10-13, 2003.
- “Voxels on Fire,” Y. Zhao, X. Wei, Z. Fan, A. Kaufman, and H. Qin, *Proceedings of IEEE Visualization 2003 (Vis’03)*, October 19-24, 2003, Seattle, Washington.
- “Piecewise C^1 Continuous Surface Reconstruction of Noisy Point Cloud via Local Implicit Quadric Regression,” H. Xie, J. Wang, J. Hua, H. Qin, and A. Kaufman, *Proceedings of IEEE Visualization 2003 (Vis’03)*, October 19-24, 2003, Seattle, Washington.
- “Dynamic Sculpting and Deformation of Point Set Surfaces,” X. Guo and H. Qin, *Proceedings of the Eleventh Pacific Conference on Computer Graphics and Applications (Pacific Graphics 2003)*, October 8-10, 2003, Canmore, Alberta, Canada, pages 123 – 130.
- “Free-Form Deformations via Sketching and Manipulating Scalar Fields,” J. Hua and H. Qin, *Proceedings of the 8th ACM Symposium on Solid Modeling and Applications (SM’03)*, Seattle, Washington, June 16-20, 2003, pages 328 – 333.
- “Interactive Shape Design Using Volumetric Implicit PDEs,” H. Du and H. Qin, *Proceedings of the 8th ACM Symposium on Solid Modeling and Applications (SM’03)*, Seattle, Washington, June 16-20, 2003, pages 235 – 246.
- “An Interpolatory Subdivision for Volumetric Models over Simplicial Complexes,” Y. Chang, K. T. McDonnell, and H. Qin, *Proceedings of the International Conference on Shape Modeling and Applications (SMI 2003)*, Seoul, Korea, May 12-16, 2003, pages 143 – 152.
- “ElasticPaint: A Particle System for Feature Mapping with Minimum Distortion,” C. Carner and H. Qin, *Proceedings of The 16th International Conference on Computer Animation and Social Agents (CASA 2003)*, Rutgers University, New Brunswick, New Jersey, May 7-9, 2003, pages 60 – 67.
- “Virtual Clay: Haptics-based Deformable Solids of Arbitrary Topology,” (invited paper) K. T. McDonnell and H. Qin, *Proceedings of the Second International Workshop on Articulated Motion and Deformable Objects (AMDO 2002)*, *Lecture Notes in Computer Science (LNCS 2492)*, Springer-Verlag, November 21-23, 2002, Palma de Mallorca, Spain, pages 1 – 20.
- “Haptics-based Volumetric Modeling Using Dynamic Spline-based Implicit Functions,” J. Hua and H. Qin, *Proceedings of the Eighth IEEE/SIGGRAPH Sympos-*

sium on Volume Visualization and Graphics 2002 (VolVis 2002), October 28-29, 2002, Boston, Massachusetts, pages 55 – 64.

“A Physics-based Framework for Subdivision Surface Design with Automatic Rules Control,” H. Xie and H. Qin, *Proceedings of the Tenth Pacific Conference on Computer Graphics and Applications (Pacific Graphics 2002)*, October 9-11, 2002, Beijing, P.R. China, pages 304 – 315.

“A New Solid Subdivision Scheme based on Box Splines,” Y. Chang, K.T. McDonnell, and H. Qin, *Proceedings of Seventh ACM Symposium on Solid Modeling and Applications (Solid Modeling 2002)*, June 17-21, 2002, Saarbruecken, Germany, pages 226 – 233.

“Dynamic Implicit Solids with Constraints for Haptic Sculpting,” J. Hua and H. Qin, *Proceedings of International Conference on Shape Modeling and Applications (SMI 2002)*, Banff, Alberta, Canada, May 17-22, 2002, pages 119 – 128.

“Dynamic NURBS with Time-varying Knot Vectors,” (abstract), H. Xie and H. Qin, *Seventh SIAM Conference on Geometric Design and Computing*, Sacramento, California, November 5-8, 2001, page 22.

“A Novel Subdivision-Based Deformable Model for Surface Reconstruction of Arbitrary Topology,” (abstract), Y. Duan and H. Qin, *Seventh SIAM Conference on Geometric Design and Computing*, Sacramento, California, November 5-8, 2001, page 22.

“Real-time Volume Sculpting System Using Implicit Functions,” (abstract), J. Hua and H. Qin, *Seventh SIAM Conference on Geometric Design and Computing*, Sacramento, California, November 5-8, 2001, pages 30 – 31.

“Physics-Based PDE Solids with Global and Local Constraints for Geometric Design,” (abstract), H. Du and H. Qin, *Seventh SIAM Conference on Geometric Design and Computing*, Sacramento, California, November 5-8, 2001, page 26.

“Haptic Sculpting of Volumetric Implicit Functions,” J. Hua and H. Qin, *Proceedings of the Ninth Pacific Conference on Computer Graphics and Applications (Pacific Graphics 2001)*, Tokyo, Japan, October 16-18, 2001, pages 254 – 264.

“Integrating Physics-Based Modeling with PDE Solids for Geometric Design,” H. Du and H. Qin, *Proceedings of the Ninth Pacific Conference on Computer Graphics and Applications (Pacific Graphics 2001)*, Tokyo, Japan, October 16-18, 2001, pages 198 – 207.

“A Novel Modeling Algorithm for Shape Recovery of Unknown Topology,” Y. Duan and H. Qin, *Proceedings of Eighth IEEE International Conference on Computer Vision (ICCV 2001)*, July 7-14, 2001, Vancouver, British Columbia, Canada, pages 402 – 409.

“Extracting Boundary Surface of Arbitrary Topology from Volumetric Datasets,” Y. Duan and H. Qin, *Proceedings of the International Workshop on Volume Graphics 2001 (VG01)*, June 21-22, 2001, Stony Brook, New York, pages 235 – 248.

- “Novel Solver for Dynamic Surfaces,” S. Ray and H. Qin, *Proceedings of Graphics Interface 2001 (GI 2001)*, June 7-9, 2001, Ottawa, Ontario, Canada, pages 47 – 54.
- “Intelligent Balloon: A Subdivision-Based Deformable Model For Surface Reconstruction Of Arbitrary, Unknown Topology,” Y. Duan and H. Qin, *Proceedings of Sixth ACM Symposium on Solid Modeling and Applications (Solid Modeling 2001)*, June 6-8, 2001, Ann Arbor, Michigan, pages 47 – 58.
- “FEM-Based Subdivision Solids for Dynamic and Haptic Interaction,” K.T. McDonnell and H. Qin, *Proceedings of Sixth ACM Symposium on Solid Modeling and Applications (Solid Modeling 2001)*, June 6-8, 2001, Ann Arbor, Michigan, pages 312 – 313.
- “Hierarchical D-NURBS Surfaces and Their Physics-Based Sculpting,” M. Zhang and H. Qin, *Proceedings of International Conference on Shape Modeling and Applications (SMI 2001)*, May 7-11, 2001, Genova, Italy, pages 257 – 266.
- “Automatic Knot Determination of NURBS for Interactive Geometric Design,” H. Xie and H. Qin, *Proceedings of International Conference on Shape Modeling and Applications (SMI 2001)* May 7-11, 2001, Genova, Italy, pages 267 – 276.
- “Virtual Clay: A Real-time Sculpting System with Haptic Toolkits,” K.T. McDonnell, H. Qin, and R. A. Wlodarczyk, *Proceedings of 2001 ACM Symposium on Interactive 3D Graphics*, Research Triangle Park, North Carolina, March 19-21, 2001, pages 179 – 190.
- “FEM-Based Dynamic Subdivision Splines,” (invited paper), H. Qin, *Proceedings of the Eighth Pacific Conference on Computer Graphics and Applications (Pacific Graphics 2000)*, Hong Kong, October 3-5, 2000, pages 184 – 191.
- “Dynamic PDE Surfaces with Flexible and General Geometric Constraints,” H. Du and H. Qin, *Proceedings of the Eighth Pacific Conference on Computer Graphics and Applications (Pacific Graphics 2000)*, Hong Kong, October 3-5, 2000, pages 213 – 222.
- “Direct Manipulation and Interactive Sculpting of PDE Surfaces,” H. Du and H. Qin, *Computer Graphics Forum (Proceedings of Eurographics 2000)*, **19**(3): C261 – C270, Interlaken, Switzerland, August 21-25, 2000.
- “Dynamic Sculpting and Animation of Free-form Subdivision Solids,” K.T. McDonnell and H. Qin, *Proceedings of IEEE Computer Animation*, Philadelphia, Pennsylvania, May 3-5, 2000, pages 126 – 133.
- “Manipulating Butterfly Subdivision Surfaces with Forces,” (abstract), C. Mandal, H. Qin, and B. C. Vemuri, *Sixth SIAM Conference on Geometric Design*, Albuquerque, New Mexico, November 2-5, 1999, page 41.
- “A Subdivision-Based Finite Element Method and its Applications,” (abstract), C. Mandal, H. Qin, and B. C. Vemuri, *Sixth SIAM Conference on Geometric Design*, Albuquerque, New Mexico, November 2-5, 1999, pages 56 – 57.

“Haptic Manipulation of Virtual Spline Objects,” (abstract), F. Dachille, H. Qin, A. Kaufman, and J. El-Sana, *Sixth SIAM Conference on Geometric Design*, Albuquerque, New Mexico, November 2-5, 1999, page 40.

“A Novel FEM-Based Dynamic Framework For Subdivision Surfaces,” C. Mandal, H. Qin and B.C. Vemuri, *Proceedings of Fifth ACM Symposium on Solid Modeling and Applications (Solid Modeling 1999)*, Ann Arbor, Michigan, June 9-11, 1999, pages 191 – 202 (also available UFL-CISE Technical Report TR98-021).

“Haptic Sculpting of Dynamic Surfaces,” F. Dachille, H. Qin, A. Kaufman, and J. El-Sana, *Proceedings of 1999 Symposium on Interactive 3D Graphics*, Atlanta, Georgia, April 26-28, 1999, pages 103 – 110.

“A New Dynamic FEM-Based Subdivision Surface Model for Shape Recovery and Tracking in Medical Images,” C. Mandal, B.C. Vemuri, and H. Qin, *Lecture Notes in Computer Science, Proceedings of First International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI'98)*, Cambridge, Massachusetts, October 11-13, 1998, pages 753 – 760.

“Physics-Based Modeling Framework for Graphics, Computer-Aided Design, and Visualization,” H. Qin, *Proceedings of International Symposium on Computing and Microelectronics Technologies*, May 3, 1998, pages 250 – 267, Peking University Press.

“Shape Recovery Using Dynamic Subdivision Surfaces,” C. Mandal, B.C. Vemuri and H. Qin, *Proceedings of Sixth IEEE International Conference on Computer Vision (ICCV 98)*, Bombay, India, January 4-7, 1998, pages 805 – 810.

“Dynamic Catmull-Clark Subdivision Surfaces,” (abstract), C. Mandal, H. Qin and B.C. Vemuri, *Fifth SIAM Conference on Geometric Design*, Nashville, Tennessee, November 3-6, 1997, page 30.

“Dynamic Smooth Subdivision Surfaces for Data Visualization,” C. Mandal, H. Qin and B.C. Vemuri, *Proceedings of IEEE Visualization'97*, Phoenix, Arizona, October 19-24, 1997, page 371 – 377.

“Dynamic Sculpting of Triangular NURBS Objects,” (abstract), H. Qin and D. Terzopoulos, *Fourth SIAM Conference on Geometric Design*, Nashville, Tennessee, November 6-9, 1995, page A24.

“D-NURBS,” (invited paper), H. Qin and D. Terzopoulos, *Proceedings of Third Pacific Conference on Computer Graphics and Applications (Pacific Graphics 1995)*, Seoul, South Korea, August, 1995, in *Fundamentals of Computer Graphics*, J. Chen *et al.* (eds.), World Scientific, Singapore, 1995, pages 455 – 474.

“Dynamic Manipulation of Triangular B-Splines,” H. Qin and D. Terzopoulos, *Proceedings of Third Symposium on Solid Modeling and Applications (Solid Modeling 1995)*, Salt Lake City, Utah, May 17-19, 1995, ACM Press, pages 351 – 360.

“Physics-Based NURBS Swung Surfaces,” H. Qin and D. Terzopoulos, *Proceedings of Sixth IMA Conference on the Mathematics of Surfaces*, London, UK, September,

1994, in *The Mathematics of Surfaces VI*, G. Mullineux (ed.), Oxford University Press, Oxford, UK, 1996, pages 267 – 290.

“NURBS with Lagrangian Dynamics,” (abstract), H. Qin and D. Terzopoulos, *Third SIAM Conference on Geometric Design*, Tempe, Arizona, November 1-5, 1993, page A27.

Other Publications “Natural Terrain Modeling Using Subdivision Surfaces,” C. Mandal, H. Qin and B.C. Vemuri, to be submitted (also available UFL-CISE Technical Report TR98-020).

“Physics-Based Shape Modeling And Shape Recovery Using Multiresolution Subdivision Surfaces,” C. Mandal, H. Qin and B.C. Vemuri, to be submitted (also available UFL-CISE Technical Report TR99-001).

Conference Presentations

“Virtual Clay: Haptics-based Deformable Solids of Arbitrary Topology,” *The Second International Workshop on Articulated Motion and Deformable Objects (AMDO 2002)*, Palma de Mallorca, Spain, November 21-23, 2002.

“A Physics-based Framework for Subdivision Surface Design with Automatic Rules Control,” *The Tenth Pacific Conference on Computer Graphics and Applications (Pacific Graphics 2002)*, Beijing, P.R. China, October 9-11, 2002.

“Physics-Based CAGD: Theory, Methodology, Techniques, and Design Environments,” *The First Chinese Conference on Geometric Design and Computing*, Qingdao, P.R. China, June 1, 2002.

“Subdivision: Its Past, Present, and Future (invited tutorial),” *The Advanced Course Session of the First Chinese Conference on Geometric Design and Computing*, Qindao, P.R. China, May 31, 2002.

“Dynamic NURBS with Time-varying Knot Vectors,” *SIAM Conference on Geometric Design and Computing*, Sacramento, California, November 5-8, 2001.

“A Novel Subdivision-Based Deformable Model for Surface Reconstruction of Arbitrary Topology,” *SIAM Conference on Geometric Design and Computing*, Sacramento, California, November 5-8, 2001.

“Real-time Volume Sculpting System Using Implicit Functions,” *SIAM Conference on Geometric Design and Computing*, Sacramento, California, November 5-8, 2001.

“Physics-Based PDE Solids with Global and Local Constraints for Geometric Design,” *SIAM Conference on Geometric Design and Computing*, Sacramento, California, November 5-8, 2001.

“Haptic Sculpting of Volumetric Implicit Functions,” *The Ninth Pacific Conference on Computer Graphics and Applications (Pacific Graphics 2001)*, Tokyo, Japan, October 16-18, 2001.

“Integrating Physics-Based Modeling with PDE Solids for Geometric Design,” *The Ninth Pacific Conference on Computer Graphics and Applications (Pacific Graphics 2001)*, Tokyo, Japan, October 16-18, 2001.

“Hierarchical D-NURBS Surfaces and Their Physics-Based Sculpting,” *International Conference on Shape Modeling and Applications (SMI 2001)*, May 7-11, 2001, Genova, Italy.

“FEM-Based Dynamic Subdivision Splines,” (invited talk), *The Eighth Pacific Conference on Computer Graphics and Applications (Pacific Graphics 2000)*, Hong Kong, October 3-5, 2000.

“Dynamic PDE Surfaces with Flexible and General Geometric Constraints,” *The Eighth Pacific Conference on Computer Graphics and Applications (Pacific Graphics 2000)*, Hong Kong, October 3-5, 2000.

“Manipulating Butterfly Subdivision Surfaces with Forces,” *Sixth SIAM Conference on Geometric Design*, Albuquerque, New Mexico, November 2-5, 1999.

“A Subdivision-Based Finite Element Method and its Applications,” *Sixth SIAM Conference on Geometric Design*, Albuquerque, New Mexico, November 2-5, 1999.

“Haptic Manipulation of Virtual Spline Objects,” *Sixth SIAM Conference on Geometric Design*, Albuquerque, New Mexico, November 2-5, 1999.

“A Novel FEM-Based Dynamic Framework For Subdivision Surfaces,” *Fifth ACM Symposium on Solid Modeling and Applications (Solid Modeling 1999)*, Ann Arbor, Michigan, June 9-11, 1999.

“Physics-Based Modeling Framework for Graphics, Computer-Aided Design, and Visualization,” *International Symposium on Computing and Microelectronics Technologies*, Peking University, May 3, 1998.

“Dynamic Catmull-Clark Subdivision Surfaces,” *Fifth SIAM Conference on Geometric Design*, Nashville, Tennessee, November 3-6, 1997.

“D-NURBS for Physics-Based Shape Modeling,” *Twenty-Third International Conference on Computer Graphics and Interactive Techniques (ACM Siggraph’96 Technical Sketches)*, New Orleans, Louisiana, August 4-9, 1996.

“Dynamic Sculpting of Triangular NURBS Objects,” *Fourth SIAM Conference on Geometric Design*, Nashville, Tennessee, November 6-9, 1995.

“Dynamic Manipulation of Triangular B-Splines,” *Third Symposium on Solid Modeling and Applications (Solid Modeling 1995)*, Salt Lake City, Utah, May 17-19, 1995.

“Physics-Based NURBS Swung Surfaces,” *Sixth IMA Conference on the Mathematics of Surfaces*, London, UK, September, 1994.

“Physics-Based Design Paradigms,” *University of Toronto and University of Waterloo Computer Graphics Joint-Meeting*, Toronto, May, 1994.

“NURBS with Lagrangian Dynamics,” *Third SIAM Conference on Geometric Design*, Tempe, Arizona, November 1-5, 1993.

Invited Talks

Invited instructor for “Advanced Graphics and Visualization: Theory, Algorithms, and Applications,” *a graduate course of the Dragon Star Initiative sponsored by National Natural Science Foundation of China*, Peking University, Beijing, China, August 18-22, 2003.

“I-DEFORM: Interactive, Dynamic, Efficient Flow for Object Rendering and Modeling,” at *Tsinghua University*, Beijing, China, August 20, 2003.

“I-DEFORM: Interactive, Dynamic, Efficient Flow for Object Rendering and Modeling,” at *Army High Performance Computing Research Center (AHPARC) Workshop on Graphics Modeling, Simulation and Visualization*, Florida A&M University, Tallahassee, Florida, June 23-24, 2003.

“I-DEFORM: Interactive, Dynamic, Efficient Flow for Object Rendering and Modeling,” at *the Department of Applied Mathematics and Statistics, SUNY at Stony Brook*, May 27, 2003.

“Virtual Clay: Haptics-based Deformable Solids of Arbitrary Topology,” at *The Second International Workshop on Articulated Motion and Deformable Objects (AMDO 2002)*, Palma de Mallorca, Spain, November 21, 2002.

“DYNASOAR: DYNAmic Solid Objects of ARbitrary topology,” at *Peking University*, Beijing, P.R. China, June 5, 2002.

“Physics-Based CAGD: Theory, Methodology, Techniques, and Design Environments,” at *the First Chinese Conference on Geometric Design and Computing*, Qingdao, P.R. China, June 1, 2002.

“Subdivision: Its Past, Present, and Future (invited tutorial),” at *the Advanced Course Session of the First Chinese Conference on Geometric Design and Computing*, Qindao, P.R. China, May 31, 2002.

“DYNASOAR: DYNAmic Solid Objects of ARbitrary topology,” at *Microsoft Research Asia*, Beijing, P.R. China, May 30, 2002.

“DYNASOAR: DYNAmic Solid Objects of ARbitrary topology,” at *Chinese Academy of Sciences*, Beijing, P.R. China, May 29, 2002.

“Manipulating Virtual Clay with Haptic Toolkits,” at *Department of Computer Science, The University of California at Davis*, Davis, California, November 6, 2001.

“Intelligent Balloon: A Subdivision-Based Deformable Model for Surface Reconstruction of Arbitrary, Unknown Topology,” at *Ford Motor Company Research Laboratory*, Dearborn, Michigan, June 7, 2001.

“FEM-Based Dynamic Subdivision Splines,” at *Pacific Graphics*, Hong Kong, October 4, 2000.

“Physics-Based Modeling For Visual Computing Applications,” at *Department of Computer Science, University of Toronto*, June 14, 2000.

“Physics-Based Modeling For Visual Computing Applications,” at *SGI Alias | Wavefront, Toronto*, June 13, 2000.

“Physics-Based Modeling for Visual Computing Applications,” at *Center for Data Intensive Computing, Brookhaven National Laboratory*, April 14, 2000.

“Physics-Based Modeling for Engineering Design,” at *Ford Motor Company Research Laboratory, Dearborn, Michigan*, June 9, 1999.

“Physics-Based Modeling Framework for Graphics, CAD, and Visualization,” at *Tsinghua University, Beijing, P.R. China*, January 7, 1999.

“Physics-Based Modeling and Shape Design Framework for CAD/CAM, Graphics, and Visualization,” at *National Institute of Standards and Technology (NIST), Gaithersburg, Maryland*, December 14, 1998.

“Dynamic Catmull-Clark Subdivision Surfaces,” at *Naval Research Laboratory, Washington, D.C.*, June 1, 1998.

“Dynamic Subdivision Surfaces and Their Applications in Graphics,” at *ChenXing Mathematics Center, Academia Sinica, Beijing, P.R. China*, May 7, 1998.

“Dynamic Subdivision Surfaces and Their Applications in Graphics,” at *Tsinghua University, Beijing, P.R. China*, May 6, 1998.

“Physics-Based Modeling Framework for Graphics, Computer-Aided Design, and Visualization,” at *Peking University, Beijing, P.R. China*, May 3, 1998.

“Physics-Based Modeling Framework for Graphics, CAD, and Visualization,” at *IBM T.J. Watson Research Center, Hawthorne, New York*, April 27, 1998.

“Physics-Based Catmull-Clark Subdivision Surfaces for CAD/CAM,” at *Structural Dynamics Research Corporation, Milford, Ohio*, April 24, 1998.

“D-NURBS for Physics-Based Shape Design,” at *Peking University, Beijing, P.R. China*, June 10, 1997.

“D-NURBS for Physics-Based Shape Design,” at *Tsinghua University, Beijing, P.R. China*, June 11, 1997.

“D-NURBS for Physics-Based Shape Design,” at *Institute of Computing, Academia Sinica, Beijing, P.R. China*, June 12, 1997.

“Physics-Based Geometric Modeling for Computer Graphics and CAD,” at *Department of Computer Science, Yale University, New Haven, Connecticut*, April 30, 1997.

“Physics-Based Geometric Modeling for Computer Graphics and CAD,” at *Department of Computer Science, Rutgers University, New Brunswick, New Jersey*, April 7, 1997.

“Physics-Based Geometric Modeling for Computer Graphics and CAD,” at *Department of Computer Science, Johns Hopkins University*, Baltimore, Maryland, April 4, 1997.

“Physics-Based Geometric Modeling for Computer Graphics and CAD,” at *Department of Computer Science, Michigan State University*, East Lansing, Michigan, March 31, 1997.

“Physics-Based Geometric Modeling for Computer Graphics and CAD,” at *Department of Computer Science, State University of New York at Stony Brook*, Stony Brook, New York, March 17, 1997.

“Towards an Interactive Physics-Based Design Environment for Automobile CAD/CAM,” at *Ford Motor Company Research Laboratory*, Dearborn, Michigan, January 30, 1997.

“Physics-Based Geometric Modeling and Design,” at *Structural Dynamics Research Corporation*, Milford, Ohio, November 8, 1996.

“Physics-Based Geometric Modeling for Graphics and CAGD,” at *Computer Science Department, University of British Columbia*, Vancouver, British Columbia, June 21, 1996.

“D-NURBS for Physics-Based Modeling,” at *School of Computing Science, Simon Fraser University*, Burnaby, British Columbia, June 20, 1996.

“Physics-Based Geometric Modeling for Graphics and CAGD,” at *Department of Ocean Engineering and Department of Mechanical Engineering, Massachusetts Institute of Technology*, Cambridge, Massachusetts, May 8, 1996.

“Dynamic Non-Uniform Rational B-Splines,” at *XOX Corporation*, St. Paul, Minnesota, October 20, 1995.

“Dynamic Non-Uniform Rational B-Splines,” at *SGI Alias | Wavefront*, Toronto, Ontario, September 6, 1995.

“Dynamic NURBS for Computer Graphics and CAGD,” at *Department of Computer Science, University of Utah*, Salt Lake City, Utah, May 30, 1995.

“Dynamic NURBS: Physics-Based Models for Graphics and CAGD,” at *College of Computing, Georgia Institute of Technology*, Atlanta, Georgia, April 12, 1995.

“Dynamic NURBS for Computer Graphics and CAGD,” at *Department of Computer and Information Sciences, University of Florida*, Gainesville, Florida, February 27, 1995.

Professional Activities EDITORIAL BOARD MEMBER:

- The journal of The Visual Computer, 2003 – present.

CONFERENCE SESSION CHAIR:

- The Seventh ACM Symposium on Solid Modeling and Applications (Solid Modeling 2002), Saarbruecken, Germany, June 17-21, 2002.
- The Second International Workshop on Articulated Motion and Deformable Objects (AMDO 2002), Palma de Mallorca, Spain, November 21-23, 2002.
- IEEE Computer Animation 2000 Conference, Philadelphia, May 3-5, 2000.

PROGRAM COMMITTEE MEMBER:

- The 7th IASTED International Conference on Computer Graphics and Imaging (CGIM 2004), August 16-18, 2004, Kauai, Hawaii, USA.
- Computer Graphics International 2004 (CGI2004) Conference, Crete, Greece, June 16-19, 2004.
- The Ninth ACM Symposium on Solid Modeling and Applications (SM 2004), Genova, Italy, June 9-11, 2004.
- International Conference on Shape Modeling and Applications 2004 (SMI 2004), Genova, Italy, June 7-9, 2004.
- Geometric Modeling and Processing 2004 (GMP2004), Beijing, China, April 13-15, 2004.
- The Eighth International Conference on Computer Aided Design and Computer Graphics (CAD/Graphics'2003), Macao, October 29-31, 2003.
- The Eleventh Pacific Conference on Computer Graphics and Applications (Pacific Graphics 2003), Canmore, Alberta, CANADA, October 8-10, 2003.
- The Sixth IASTED International Conference on Computers, Graphics, Imaging (CGIM 2003), Honolulu, Hawaii, USA, August 13-15, 2003.
- The Third International Workshop on Volume Graphics (VG03), Tokyo, Japan, July 7-8, 2003.
- Computer Graphics International Conference 2003 (CGI 2003), Tokyo, Japan, July 9-11, 2003.
- International Conference on Shape Modeling and Applications (SMI 2003), Seoul, Korea, May 12-16, 2003.
- The 16th International Conference on Computer Animation and Social Agents (CASA'2003), New Brunswick, New Jersey, USA, May 7-9, 2003.
- The Asian Symposium on Computer Mathematics 2003 (ASCM'03), Beijing, P.R. China, April 17-19, 2003.
- The Second International Workshop on Articulated Motion and Deformable Objects (AMDO'2002), Palma de Mallorca, Spain, November 21-23, 2002.
- The Tenth Pacific Conference on Computer Graphics and Applications (Pacific Graphics 2002), Beijing, P.R. China, October 9-11, 2002.
- The 15th International Conference on Computer Animation (Computer Animation 2002), Geneva, Switzerland, June 19-21, 2002.
- Computer Graphics International Conference 2002 (CGI2002), University of Bradford, Bradford, UK, July 1-5, 2002.

- The Seventh ACM Symposium on Solid Modeling and Applications (Solid Modeling 2002), Saarbruecken, Germany, June 17-21, 2002.
- Geometric Modeling and Processing 2002: Theory and Applications, Tokyo, Japan, July 10-12, 2002.
- International Conference on Shape Modeling and Applications (SMI 2002), Banff, Alberta, Canada, May 17-22, 2002.
- ACM Symposium on Virtual Reality Software and Technology 2001 (VRST), Banff, Alberta, Canada, November 15-17, 2001.
- Eurographics Workshop on Animation and Simulation 2001 (EG CAS'2001), Manchester, UK, September 2-3, 2001.
- CAD/Graphics'2001 (The Seventh International Conference on Computer Aided Design and Graphics), Kunming, China, August 20-22, 2001.
- IEEE Computer Animation 2001 (The 14th Conference on Computer Animation), Seoul, Korea, November 6-8, 2001.
- Pacific Graphics 2001 (The Ninth Pacific Conference on Computer Graphics and Applications), Tokyo, Japan, October 16-18, 2001.
- Computer Graphics International Conference 2001 (CGI2001), Hong Kong, July 3-6, 2001.
- The Second International Workshop on Volume Graphics 2001 (VG01), Stony Brook, NY, June 21-22, 2001.
- Pacific Graphics 2000 (The Eighth Pacific Conference on Computer Graphics and Applications), Hong Kong, October 3-5, 2000.
- IEEE Computer Animation 2000 Conference, Philadelphia, May 3-5, 2000.
- Geometric Modeling and Processing 2000: Theory and Applications, Hong Kong, April 10-12, 2000.

PANEL MEMBER AND REFEREE FOR (FUNDING AGENCIES):

- National Science Foundation, 1997 – present.
- The Research Council of Norway, 2002 – present.

REFEREE FOR (BOOKS, 1999 – PRESENT):

- *McGraw-Hill*.
- *Springer-Verlag*.

REFEREE FOR (JOURNALS, 1994 – PRESENT):

- *ACM Computing Surveys*.
- *Computer Aided Geometric Design*.
- *Graphical Models*.
- *Communications of the ACM*.
- *ACM Transactions on Graphics*.

- *The Visual Computer.*
- *Image and Vision Computing.*
- *IEEE Transactions on Visualization and Computer Graphics.*
- *IEEE Transactions on Pattern Analysis and Machine Intelligence,*
- *Computer Aided Design.*
- *Graphical Models and Image Processing.*
- *The International Journal of High Performance Computer Graphics, Multi-media and Visualization.*
- *Computer Graphics Forum (The International Journal of the Eurographics Association).*
- *International Journal of Shape Modeling.*
- *ASME Transactions, Journal of Computing and Information Science in Engineering (JCISE).*
- *IEEE Transactions on Medical Imaging.*

REFEREE FOR (CONFERENCES, 1994 – PRESENT):

- *ACM Siggraph.*
- *ACM Solid Modeling and Applications.*
- *Computer Graphics International Conference (CGI).*
- *Graphics Interface.*
- *IEEE Visualization.*
- *Eurographics Workshop on Animation and Simulation.*
- *International Conference on Shape Modeling and Applications.*
- *ACM Conference on User Interface Software Technology (ACM UIST).*
- *International Conference on Shape Modeling and Applications (SMI).*
- *Eurographics.*
- *IEEE/ACM SIGGRAPH Symposium on Volume Visualization and Graphics.*
- *ACM Symposium on Interactive 3D Graphics.*
- *ASME Design Automation Conference.*
- *Dagstuhl Conference on Geometric Design.*
- *IASTED International Conference on Computer Graphics and Imaging.*

**Teaching
Activities**

“Geometric Foundations for Graphics and Visualization (CSE530),” Spring 1999, Spring 2000, Spring 2001, Spring 2002, CS Department, SUNY at Stony Brook.

“Fundamentals of Computer Graphics (CSE328),” Fall 1999, Fall 2000, Fall 2001, CS Department, SUNY at Stony Brook.

“Introduction to Engineering and Applied Sciences (EAS101),” Fall 1999, CS Department, SUNY at Stony Brook.

“Seminar on Modeling and Simulation (CSE665),” 1999 – present (both Spring and Fall), CS Department, SUNY at Stony Brook.

“Introduction to Visualization (CSE332),” Fall 1998, CS Department, SUNY at Stony Brook.

“Physics-Based Modeling for Visual Computing (CSE631),” Spring 1998, Spring 2001, Spring 2002, CS Department, SUNY at Stony Brook.

“Introduction to Computer Graphics (CAP4700),” Spring 1996, Spring 1997, CISE Department, University of Florida (UFL).

“Computer Graphics (CAP5705),” Spring 1996, Spring 1997, CISE Department, UFL.

“Selected Topics on 3-D Interactive Graphics (CIS6930),” Fall 1996, CISE Department, UFL.

University Services

Examiner for CS Ph.D. Qualification Exams, May, 2003.

Faculty Judge, Graduate Research Conference 2003, Department of Computer Science, SUNY at Stony Brook, April, 2003.

Computer Science Graduate admission Committee Member, 2002 – present.

Computer Science Faculty Recruiting Committee Member, 2001.

Computer Science Graduate Admission Committee Member, 1997 – 2001.

Creator and Organizer for annual Computer Science Graduate Student Orientation, 1998 – 2000.

Examiner for CS Ph.D. Qualification Exams, October, 1999.

One Ph.D. student graduated (at the University of Florida) in December, 1998.

Two M.Sc. students graduated (SUNY at Stony Brook) in June, 1999.

Three M.Sc. students graduated (SUNY Stony Brook) in December, 2000.

Advisor of ten Ph.D. students, five M.Sc. students, and one undergraduate student (at SUNY at Stony Brook).

Advisor of three Ph.D. students, three M.Sc. students and one undergraduate (previously at UFL from 1996 to 1997).

Thesis and Examination Committee member for many other Ph.D. and M.Sc. students at CS Department of SUNYSB (e.g., Anurag Purwar (Mechanical Engineering), Neophytos Neophytou, Yang Wang, Ye Zhao, Wei Hong, Baoquan Chen, Frank Dachille, Yan Chen, Jihad El-Sana, Chuan-Kai Yang, Xiaoming Wei, Nan Zhang, Hoijung Chung (M.Sc.), Kefei Lu (M.Sc.), etc.).

Dissertation and Thesis Committee Member for: Minbo Shim (CS Ph.D. candidate), Yanling Guo (EE Ph.D. candidate), Shuangying Huang (CS M.Sc. candidate) (previously at UFL from 1996 to 1997).

**Ph.D.
Advisees**

Dr. Ye Duan (received his Ph.D. at SUNY at Stony Brook in August, 2003).

Dr. Kevin T. McDonnell (received his Ph.D. at SUNY at Stony Brook in August, 2003).

Dr. Chhandomay Mandal (received his Ph.D. degree at UFL in December, 1998).

Christopher Carner, Ying He, Kexiang Wang, Xiaohu Guo, Robert A. Wlodarczyk, Peng Du (at SUNY at Stony Brook).

Ye Duan, Kevin T. McDonnell, Sumanro Ray, Hui Xie, Haixia Du, Meijing Zhang, Jing Hua, Yu-Sung Chang, Jing Luo, Xiaojing Li, Tao Yang (at SUNY at Stony Brook).

Tamara Pearson (CS Ph.D. candidate), Carol Will (ME Ph.D. candidate) (previously at UFL from 1996 to 1997).

**M.Sc.
Advisees**

Matt Richardson (received his M.Sc. degree in August, 2003).

Juan Ramirez, Vivek Palan (received their M.Sc. degrees in June, 1999); Qinhong Pan, Tao Wang, Honglei Zhang (received their M.Sc. degree in December, 2000).

Ed Porras, Chris Gilmore, Chhandomay Mandal (previously at UFL from 1996 to 1997).

**Undergraduate
Advisees**

Robert A. Wlodarczyk (at SUNYSB).

Chris Gilmore (previously at UFL in 1996).

Memberships

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE).

IEEE COMPUTER SOCIETY.

ASSOCIATION FOR COMPUTING MACHINERY (ACM).

SOCIETY FOR INDUSTRIAL AND APPLIED MATHEMATICS (SIAM).

THE EUROPEAN ASSOCIATION FOR COMPUTER GRAPHICS (EUROGRAPHICS).