Dinesh Manocha

Phi Delta Theta/Matthew Mason Distinguished Professor

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Dinesh Manocha is currently a Distinguished Professor of Computer Science at the University of North Carolina at Chapel Hill. He leads a major research group with more than 24 members on geometric and simulation algorithms with applications to computer graphics, robotics and virtual environments. He is also involved in a number of inter-disciplinary activities and committees at the Department, College and the University Level. He has published more than 360 papers in the leading conferences and journals in computer graphics, robotics, computational geometry, databases, multimedia, high performance computing and symbolic computation, and received 12 best paper awards. He has also served as program committee member or program chair of more than 85 leading conferences in this area. Moreover, he has served as a member of the editorial board or guest editor of eleven leading journals. He has won many awards including NSF Career Award, ONR Young Investigator Award, Sloan Fellowship, IBM Fellowship, SIGMOD IndySort Winner, Honda Research Award and UNC Hettleman Prize. He is a Fellow of ACM, IEEE, and AAAS and received Distinguished Alumni Award from Indian Institute of Technology, Delhi.

Manocha has supervised 55 M.S. and Ph.D. students over the last 21 years at UNC Chapel Hill. His research group has developed many well-known software packages for collision detection, triangulation, GPU-based algorithms, solid modeling and solving algebraic systems. These packages have been downloaded by more than 100,000 users worldwide and licensed to more than 45 industrial organizations including Intel, Microsoft, Disney, Ford, Kawasaki, Siemens, Phillips Labs, MSC Software, Lockheed Martin, Raytheon etc. His group is actively collaborating with many industrial organizations including Disney, Boeing, Intel, NVIDIA, Microsoft, SAIC, ARA, Willow Garage, AMD/ATI, Dolby Research and Lockheed. Manocha's research is currently supported by ARO, NSF, DARPA, RDECOM, ONR, and many industrial partners, and he has served as a Principal Investigator or Co-Principal Investigator on more than 60 grants.

CONTENTS

EDUCATION 4

APPOINTMENTS 4

HONORS AND AWARDS 4

PROGRAM & WORKSHOP CHAIR POSITIONS 5

EDITORIAL DUTIES 5

CONTRACTS AND GRANTS 5

CURRENT SUPPORT 6
PENDING SUPPORT 6
PAST SUPPORT 6

INVITED TALKS AT CONFERENCES & WORKSHOPS 8

PROGRAM COMMITTEES 10

PANELS 11

COURSES AND TUTORIALS 11

PRESS COVERAGE 11

DEPARTMENT COMMITTEES 12

UNIVERSITY COMMITTEES 12

COURSES TAUGHT 13

SOFTWARE SYSTEMS 13

PUBLICATIONS 14

BOOKS AND MONOGRAPHS 14
REFERRED JOURNAL PUBLICATIONS 14
REFERRED BOOK CHAPTERS 23
REFERRED CONFERENCE PUBLICATIONS 24
REFERRED VIDEO PUBLICATIONS 37

GRADUATE STUDENTS 37

CURRENTLY SUPERVISED 37
STUDENTS GRADUATED 38

POSTDOCS 39

CURRENTLY SUPERVISED 39
POSTDOCS PREVIOUSLY SUPERVISED 39

PH.D. COMMITTEES **39**

M.S. COMMITTEES **40**

REFEREE FOR **40**

INVITED COLLOQUIA **41**

EDUCATION

University of California at Berkeley

Ph.D. in Computer Science, May 1992

Thesis title: Algebraic and Numeric Techniques for Modeling and Robotics
Thesis supervisor: John F. Canny
Major: Geometric and Solid Modeling, Computer Graphics, Numeric and Symbolic Computation, Robotics
Minors: Mathematics and Software Systems

M.S. in Computer Science, 1990

Specialization in Computer Graphics and Geometric Modeling

Indian Institute of Technology, Delhi, India

B.E. in Computer Science and Engineering, 1987

APPOINTMENTS

- Phi Delta Theta/Matthew Mason Distinguished Professor, Department of Computer Science, Professor, University of North Carolina at Chapel Hill, July, 2006 –present.
- Visiting Researcher, Microsoft, April – August, 2008.
- Professor, Department of Computer Science, University of North Carolina at Chapel Hill, January 2001-present.
- Associate Professor, Department of Computer Science, University of North Carolina at Chapel Hill, January 1998-December 2000.
- Visiting Researcher, Microcomputer Research Lab (MRL) at Intel, Santa Clara, CA, May 1998-August 1998; May 1999-August 1999.
- Assistant Professor, Department of Computer Science, University of North Carolina at Chapel Hill, July 1992-December 1997.
- Post Doctorate Researcher, Department of Electrical Engineering and Computer Science, University of California at Berkeley, May 1992-August 1992.
- Research & Teaching Assistant, Department of Electrical Engineering and Computer Science, University of California at Berkeley, August 1988-May 1992.
- Research Visitor, General Motors Research Laboratory, May 1989-August 1989.
- Research Visitor, Olivetti Research Center, May 1988-August 1988.

HONORS AND AWARDS

1. 2012: Kenan Research Award, University of North Carolina at Chapel Hill
2. 2011: Distinguished Alumni Award, Indian Institute of Technology, Delhi
3. 2011: Fellow of Institute of Electrical and Electronics Engineers (IEEE)
4. 2011: Fellow of American Association for the Advancement of Science (AAAS)
5. 2010: IBM Smarter Planet Innovation Award
6. 2009: Fellow of Association for Computing Machinery (ACM)
7. 2008: Best Paper Award at Computer-Aided Design (CAD) Conference
8. 2008: NVIDIA Professor Partnership Award
9. 2008: Best Poster Award, Acoustical Society of America Meeting
10. 2007: 2nd Best Paper Award and Honorable Mention, Computer and Graphics
11. 2007: Best Paper Award at ACM VRST Conference
12. 2007: Simulation Technology Demonstration at the Capitol Hill (by invitation)
13. 2006: Awarded Phi Delta Theta/Matthew Mason Distinguished Professorship, UNC Chapel Hill

14. 2006: IndySort (Sort Benchmark) Co-winner, ACM SIGMOD Conference
15. 2005: Best Paper, Research and Development Track, I/ITSEC
16. 2005: Best Paper Award, IEEE VR Conference
17. 2004: Best Paper Award, Pacific Graphics Conference
18. 2003: Best Paper Award, ACM/SIGGRAPH Conference on Solid Modeling and Applications
19. 2001: Best Paper Award, ACM Multimedia Conference
20. 2001: Best Panel Award, IEEE Visualization Conference
21. 1999: Best Paper Award, Eurographics Conference
22. 1998: Hettleman Award for Scholarly Achievement, UNC Chapel Hill
23. 1998: Honda Research Award
24. 1997: Office of Naval Research Young Investigator Award
25. 1996: Best Paper Award, SuperComputing, 1996
26. 1995: National Science Foundation CAREER Award
27. 1995: Presidential Faculty Fellow nominee, The University of North Carolina at Chapel Hill
28. 1995: Alfred P. Sloan Fellow
29. 1993: Research Award from University Research Council, University of North Carolina at Chapel Hill
30. 1992: Junior Faculty Award at the University of North Carolina at Chapel Hill
31. 1992: Research award by Mitsubishi Electric Research Laboratory for research on inverse kinematics and its application to robotics and graphics
32. 1991: IBM Graduate Fellowship
33. 1988: Alfred and Chella D. Moore Fellowship for graduate studies in Computer Science at the University of California at Berkeley
34. 1983-87: Merit Prizes and Certificates for Academic Excellence at the Indian Institute of Technology, Delhi, India
35. 1983: Merit Prize and Certificate for obtaining VII position in All India Senior Secondary Certificate Examination
36. 1981-87: National Talent Scholarship by the Government of India
37. 1979-81: Junior Science Talent Scholarship by the Government of India

PROGRAM & WORKSHOP CHAIR & ADVISORY POSITIONS

1. SIGGRAPH Executive Committee, Director-At-Large, 2011 – 2014
2. Co-Chair, Computational Acoustics for Complex Indoor and Outdoor Spaces, ASA, 2012
3. General Co-Chair, Workshop at SIGGRAPH Asia (WASA), 2012
4. Chair, Pierre Bézier Award Selection Committee, 2011
5. General Co-Chair, Workshop on Hybrid Multi-Core Computing, 2011
6. Co-Chair, Workshop on "Motion Planning for Physical Robots", ICRA, Shanghai, 2011
7. Co-Chair, "1st IEEE Workshop on Modeling, Simulation and Visual Analysis of Large Crowds", ICCV, Barcelona, 2011.
8. Member, External Advisory Board, Geometric Modeling and Scientific Visualization Center, KAUST, 2011 onwards
9. Chair, INRIA Review Panel on "Graphics and Interaction", Paris, 2010
10. Program Co-Chair, ACM Solid and Physical Modeling, Stony-Brook, NY, 2008
11. Advisory Board, SIGGRAPH ASIA Program Committee, 2008, 2009
12. Workshop Co-Chair, Multi-Core and Many-Core Computing, ACM/IEEE SuperComputing Conference 2007
13. Program Co-Chair, ACM Solid and Physical Modeling, Beijing, 2007
14. Workshop Co-Chair, EDGE Computing Workshop, Chapel Hill, 2006
15. Program Co-Chair, Pacific Graphics, Macau, 2005.
16. Workshop Co-Chair, ACM Workshop on General Purpose Computation using Graphics Processors, ACM SIGGRAPH, Los Angeles, 2004.

17. Workshop Co-Chair, WIHAVE, Workshop on Intelligence, Human Augmentation and Virtual Environments, Chapel Hill, 2002.
18. Video Program Committee Chair: ACM Symposium on Computational Geometry, 2001.
19. Program Chair: ACM Workshop on Applied Computational Geometry, Philadelphia, PA, 1996.
20. Program Co-Chair: Workshop on Simulation, Behavior, and Action in Virtual Environments, Iowa (sponsored by ONR and ACM SIGGRAPH), 1995.

EDITORIAL DUTIES

1. Senior Editor, *ACM Transactions on Spatial Algorithms and Systems* (TSAS), 2013-onwards
2. Associate Editor, *Journal of Applicable Algebra* (AAECC), 2003-2008
3. Associate Editor, *ACM Transactions on Graphics*, 2008-onwards
4. Associate Editor*, International Journal of High Performance Computing & Applications*, 2009-onwards
5. Associate Editor, *Graphical Models and Image Processing*, 1999-Present
6. Associate Editor, *IEEE Transactions on Visualization and Computer Graphics*, 1999-2003
7. Guest Co-Editor, International Journal of Robotics Research, special issue on "*Motion Planning for Physical Robots",* 2012-2013.
8. Guest Co-Editor, *International Journal on Computational Geometry and Applications*, two special issues on Applied Computational Geometry, 1998.
9. Guest Co-Editor*, IEEE Computer Graphics and Applications*, special issue on handling large datasets, 2007
10. Co-Editor, *Proceedings of IEEE*, Special issue on Edge Computing, 2007.
11. Guest Co-Editor, *Parallel Computing*, Special issue on "Computing with Accelerators", 2007.
12. Guest Co-Editor, *Computer-Aided Design*, Special issue on Solid and Physical Modeling, 2007.
13. Guest Co-Editor, *Computer Aided Geometric Design*, Special issue on Solid and Physical Modeling, 2007.
14. Guest Co-Editor, *IEEE Transactions on Automation Science and Engineering*, Special issue on Solid and Physics Modeling, 2007.
15. Guest Co-Editor, *Computer-Aided Design*, Special issue on Solid and Physical Modeling, 2008.
16. Guest Co-Editor, *Computer Aided Geometric Design*, Special issue on Solid and Physical Modeling, 2008.
17. Guest Co-Editor, *IEEE Transactions on Automation Science and Engineering*, Special issue on Solid and Physics Modeling, 2008.

CONTRACTS AND GRANTS

Current Support

1. 2013-2015: "A New Robot Testbed for Real-Time Motion Strategies and Autonomous Personal Assistants", National Science Foundation, $340K, PI.
2. 2013-2016: "Research in Crowd Simulation", Boeing, $300K, PI
3. 2013-2016: "Neurosurgical Simulator", $525K, Kitware (NIH Award), PI
4. 2011-2014: "Computing Robot Motions for Home Healthcare Assistance", National Science Foundation, $350K Co-PI.
5. 2012-2014, "High-Performance Clusters for Computational Acoustics and Physics-Based Simulation", Army Research Office, $145K, Co-PI.
6. 2012-2013, "Research in Crowd Simulation", Hajj Research Institute, $150K (direct cost), PI.
7. 2011 – 2015: "Interactive Acoustic Simulation in Urban Environments", Army Research Office, $850K, PI.
8. 2010-2013: "GPU-based Robot Algorithms", Willow Garage, $150K, PI (direct costs)
9. 2010-2014: "Research in Crowd Simulation and Sound Rendering for Games", Intel, $400K, Co-PI (direct costs)

10. 2010-2013: “Digital Layout and Assembly of Large CAD Structures”, NSF, PI (about $450K)
11. 2010-2014: “Interactive Computational Algorithms for Acoustic Simulation in Complex Environments”, ARO, PI, ($550K)
12. 2009-2014, “Interactive Auditory Displays”, NSF, Co-PI (about $550K)

Pending Support

Past Support

1. 2009-2012, “PetaScale Acoustic Simulation”, NSF, PI (about $850K)
2. 2011-2012: “Interactive Large-Scaled Crowd Simulation”, Boeing/KAUST, $100K, PI.
3. 2006-2011: “Multiresolution Algorithms for Processing Giga-Models: Real-time Visualization, Reasoning, and Interaction”, Army Research Office, Co-PI, (about $550K).
4. 2010-2011: “Traffic Simulation for IBM Smart Planet”, $20K, PI, IBM (direct costs)
5. 2009-2010, “Interactive Sound Rendering for Computer Games”, Microsoft, Co-PI, $80K (Direct Costs)
6. 2008-2010: “High Performance Many-Core Clusters for Modeling and Simulation”, Army Research Office, Co-PI (about $150K)
7. 2009-2010: “Interactive Crowd & Traffic Simulation for Urban Training Environments”, Army, RDECOM, PI (about $500K)
8. 2007-2010: “Research in GPGPU and Many-Core Computing”, Co-PI, Intel, $225K (Direct Costs) + Equipment support.
9. 2008-2009: “Experiential Technologies for Urban Warfare and Disaster Response”, Army, RDECOM, PI (about $725K).
10. 2008-2009: “Interactive Ray Tracing”, PI, NVIDIA, $25K (Direct Costs) + Equipment Support
11. 2005-2009: “Exploiting Cyber-Infrastructure for Creation and Use of Multi-Disciplinary Engineering Models”, NSF, Co-PI, $1.150M.
12. 2007-2008: “Research in Interactive Collision Detection and Cloth Simulation”, PI, Disney, $50K (Direct Costs).
13. 2004-2009: “Multiresolution Algorithms for Virtual Prototyping of Massive CAD Models”, NSF, PI (about $384K).
14. 2006 – 2008: “Research in Edge Computing”, Disruptive Technology Office, PI, $200K.
15. 2006-2008: “High Performance Clusters for Modeling and Simulation”, Army Research Office, DURIP program, PI, $82K.
16. 2002-2007: “Handling Complex Datasets: Representation, Interactive Display and Interaction”, Army Research Office, PI (about $395K).
17. 2006: “Support for EDGE Workshop”, DARPA, DTO, NSF, NVIDIA and ATI, PI, $65K.
18. 2005-2009: “Computer Generated Force Scalability, Army RDECOM, PI (about $2.5M).
19. 2003-2007: “Enabling Real-Time Interaction for Moving Avatars in Virtual Environments”, Office of Naval Research, Co-PI (about $660,000).
20. 2001-2006: “High Fidelity Virtual Touch: Algorithms, Applications and Evaluation”, National Science Foundation, Co-PI (about $370K).
21. 2004-2006: “Portable Walkthrough and Computer Generated Force Computation”, DOD, PI (about $80K).
22. 2005-2007: “Missile Plume Simulation Improvements using GPU Chemical Kinetics Coprocessor”, $50K, PI, MDA.
23. 2001-2005: “Real time Physically-Based Modeling and Interaction”, Intel, Co-PI ($225K, direct costs + $75K equipment).
24. 2005-2006: “Efficient layouts of large datasets”, DOE LLNL, PI (about $30K)

25. 2004-2006: “Interactive OneSAF Computations using COTS Graphics Hardware”, DARPA, PI (about $875K).
26. 2000-2005: “Real Time Interaction in Virtual Environments”, Office of Naval Research, Co-PI (about $645K).
27. 1999-2005: “Research in Walkthroughs and Simulation”, Alias/Wavefront, Principal Investigator ($495K software donation).
28. 1999-2004: “Real-Time Walkthroughs of Serious Synthetic Environments”, National Science Foundation, Principal PI (about $480,000).
29. 2004: “Support for ACM Workshop on General Purpose Computation using Graphics Processors”, NVIDIA, ATI, 3D Labs, RDECOM, PEO-STRI & Army Research office.
    Co-PI, (about $35K).
30. 1999-2002: “Accurate Boundary Evaluation and Interactive Display of Large Solid Models”, Army Research Office, PI (about $250,000).
31. 1999-2003: “Interactive Display of Complex Datasets”, Lawrence Livemore National Labs (DOE ASCI Program), PI (about $1,250,000).
32. 2001-2003: “Instrumentation for Interactive Display of Complex Datasets”, Army Research Office, PI (about $173K).
33. 2000-2003: “Video Based Representations and Rendering of Large Real and Synthetic Environments”, Office of Naval Research, PI (about $315K).
34. 1998-2001: “Acquisition of a Graphics Supercomputer for Synthetic Environments Serving Science and Engineering”, National Science Foundation, Co-Pr (about $1,460,000).
35. 1997-2000: “Interactive Walkthrough of large CAD models”, Office of Naval Research, PI (about $375,000).
36. 1999-2000: “Support for Research in Collision Detection and Interactive Walkthroughs”, Intel, PI (about $130,000).
37. 1999-2000: “Web based Distance Education Curricula for Computer Graphics and Scientific Computing”, UNC Chapel Hill, PI (about $12,000).
38. 1998-2000: “Instrumentation for Interactive Synthetic Environments, Department of Defense DURIP Award, PI (about $232,000).
39. 1997-99: “Interactive Computer Graphics”, Intel Research Award, PI (about $290,000).
40. 1997-98: “Virtual Reality Station”, Office of Naval Research, PI (about $160,000).
41. 1997-2000: “Technology for Education 2000 Program”, Intel, Co-PI (about $2,870,000).
42. 1996-2000: “CAREER: Algebraic and Geometric Techniques for Interference Detection in Static and Dynamic Environments”, National Science Foundation, PI (about $200,000).
43. 1996-97: “Interactive Modeling and Interactive Visualization of Complex Datasets”, DOD DURIP Proposal, PI (about $137,000).
44. 1996-99: “Modeling and interactive walkthrough of large CAD models”, Army Research Office, PI (about $246,000).
45. 1995-97: “Sloan Fellowship”, (about $30,000).
46. 1996-98: “Interactive Collision Detection for Virtual Environments”, Ford Motor Company, PI (about $22,500).
47. 1994-98: “Numeric and Symbolic Manipulation of Polynomial Systems”, National Science Foundation, PI (about $200,000).
48. 1996-97: “Supplemental Support for Interactive Model Construction, Display and Collision Detection for Virtual Environments", Office of Naval Research, PI (about $25,000).
49. 1995-96: “Simulation-Based Design”, DARPA Sub-Contract, Monitored by Lockheed Martin, Co-PI (about $400,000).
50. 1996: “Travel support for ACM Workshop on Applied Computational Geometry”, National Science Foundation, PI (about $8,000).
51. 1995-96: “Model construction and interactive walkthrough of large CAD models”, Army Research Office, PI (about $125,000).

52. 1994-97: “Interactive Model Construction, Display and Collision Detection for Virtual Environments", Office of Naval Research, PI (about $250,000).
53. 1994: “Modeling with Non-Linear Constraints”, University Research Council, UNC Chapel Hill, PI (about $2000).
54. 1994-95: “Workshop on simulation and interaction in virtual environments”, Office of Naval Research, Co-PI (about $10,000).
55. 1993-96: “Enabling Technologies and Application Demonstrations for Synthetic Environments”, Advanced Research Projects Agency, Senior Investigator. Fred Brooks and Henry Fuchs, Principal Investigators (about $3,300,000).
56. 1993: Junior Faculty Award, UNC Chapel Hill, PI (about $3000).

INVITED TALKS AND DISTINGUISHED LECTURES

1. Keynote Speaker, International Conference on Contemporary Computing, India, August 2013
2. Robotics Institute Seminar, Carnegie Mellon University, February 2013
3. Boeing Distinguished Researcher & Scholar Seminar, June 2012
4. Lindbergh Seminar speaker, University of Wisconsin, May 2012
5. Distinguished Lecture, AMD, March 2012
6. Distinguished Lecture, Tata’s Computational Research Lab, December 2011
7. Distinguished Lecture, NVIDIA India, December 2011
8. Distinguished Lecture Series, Texas A & M University, 2011
9. University of Maryland Engineering Robotics Seminar Series, College Park, 2011
10. Distinguished Lecture Series, Lawrence Livermore National Labs, 2011
11. Invited Speaker, Workshop on Hybrid Multi-Core Computing, Goa, India, December 2010
12. Keynote Speaker, ACM VRST Conference, Hong Kong, November 2010
13. Invited speaker, Workshop on “Motion Planning: From Theory to Practice”, RSS, June 2010
14. Invited speaker, Workshop on “Search and Pursuit/Evasion”, ICRA, May 2010
15. Invited speaker, Workshop on City Modeling, Shenzhen Institute of Advanced Technology, April, 2010
16. Distinguished Lecture Series Speaker, UNC Charlotte, February 2010
17. Distinguished Lecture Series Speaker, Columbia University, February 2010
18. IBM Series on Smart Planet, TJ Watson Research Center, February 2010
19. Invited speaker, Motion in Games, Zeist, Netherlands, 2009
20. Keynote speaker, IEEE International conference on Computer-Aided Design and Computer Graphics, 2009
21. Keynote speaker, Computer Animation and Social Agents (CASA), Seoul, Korea, 2008
22. Invited speaker, Workshop on Geometric Modeling, SUNY, Stony Brook, NY, 2008
23. Invited speaker, Workshop on programming massively parallel processors, NCSA, UIUC, 2008
24. Invited speaker, Workshop on Motion in Games (MiG), Utretcht, Holland, 2008
25. Keynote speaker, TCS Workshop on Virtual Reality, New Delhi, India, 2008
26. Keynote speaker, IAPR International Conf. on Discrete Geometry for Computer Imagery, 2008
27. Invited speaker, DARPA workshop on Virtual Cityscapes, Reno, 2008
28. Invited speaker, Workshop on Algorithmic Motion Planning, IROS, 2007
29. Invited speaker, Workshop on Geometric Processing, Tsinghua University, June 2007
30. Invited Speaker, Workshop on Many-Core Computing, Microsoft Research, 2007
31. Invited speaker, Workshop on Non-Linear Computational Geometry, IMA, May 2007
32. Invited Speaker, Swarms Workshop, Univ. of Pennsylvania, May 2007
33. Invited speaker, DARPA workshop on Constructive Simulation, San Diego, January 2007
34. Invited speaker, DARPA Workshop on Future Directions for High Performance Embedded Processing, Orlando, December 2006
35. Invited Speaker, GPGPU Workshop, ACM/IEEE SuperComputing 2006
36. Invited Workshop Speaker, Oak Ridge National Labs, September 2006
37. Invited Panel Speaker, NSF DMII PI Meeting, July, 2006

38. Invited Speaker, Aiya Napa Workshop on Modeling and Rendering, June 2006
39. Keynote Speaker, Pacific Graphics, October 2005
40. First International Workshop on Data Management on New Hardware, Baltimore, MD, June 2005
41. Motion Planning Workshop, Toulouse, France, January 2005
42. Workshop on Modeling & Simulation: The Next Decade, Las Cruces, NM, December 2004
43. Inter-service/Industry, Training Simulation Conference (I/ITSEC), Orlando, FL, December 2004
44. Dist. Lecture Series Speaker, Arizona State University, November 2004
45. Keynote Speaker, Graphics Interface Conference, London, Ontario, May 2004
46. DIMACS Workshop on Computer-Aided Design and Manufacturing, Rutgers, NJ, October 2003
47. Dagstuhl workshop on hierarchical methods, Germany, June 2003
48. Workshop on Geometric Modeling and Animation, FoCM, Minneapolis, August 2002
49. Mini-Symposium on Computational Geometry, Curves and Surfaces Conference, St. Malo, June 2002
50. Mini-Symposium on Robustness, SIAM Conference on Geometric Design, Sacramento, CA, 2001
51. Workshop on Uncertainty in Geometric Computation, The University of Sheffield, July 2001
52. Workshop on Surgical Simulation, Stanford, CA, June 2001
53. NRL Workshop on Augmented Reality, Washington, DC, December 2000
54. AMS Symbolic Computation: Solving Equations in Algebra, Geometry, and Engineering, Mount Holyoke College, MA, 2000
55. Workshop on Key Research Issues and Opportunities in Motion Planning, LAAS Toulouse, France, 2000
56. Workshop on Image Synthesis and Interactive 3D Graphics, Dagstuhl, Germany, 2000
57. Workshop on Motion Support in Virtual Prototyping, Stanford, CA, May 1999
58. Mini-Symposium on Applications of Computer Algebra in Industry, SIAM Annual Meeting, Atlanta, GA, 1999
59. NSF/DOE Workshop on Large Scale Visualization and Data Management, Salt Lake City, Utah, May 1999
60. Eighth IMA Conference on Mathematics of Surfaces, University of Birmingham, England, 1998
61. Workshop on Hierarchical Methods in Computer Graphics, Dagsthul, Germany, 1998
62. ACM Siggraph Course on Interactive Walkthroughs, Los Angeles, CA, 1997
63. Geometry Software Workshop, Nice, France, June 1997
64. ACM Symposium on Computational Geometry, Nice, France, 1997
65. American Mathematical Society Course on Computational Algebraic Geometry, San Diego, CA, 1997
66. 1st CGC Workshop on Computational Geometry, Johns Hopkins University, Baltimore, MD, October 1996
67. 2nd Workshop on Algorithmic Foundations of Robotics, Toulouse, France, July 1996
68. Graphicon'96: The 6th International Conference & Exhibition on Computer Graphics and Visualization, St. Petersburg, Russia, July 1996
69. Workshop on Software & Mathematical Visualization, Princeton, NJ, June 1996
70. East Coast Computer Algebra Day, IBM TJ Watson Research Center, April 1996
71. Workshop on Algebra for Solving Real Polynomials, Park City, UT, July 1995
72. Geometry Software Workshop, Geometry Center, University of Minnesota, January 1995
73. SPIE Conference on Curves and Surfaces for Computer Graphics, Boston, MA, 1992
74. Invited Mini-Symposium Speaker, SIAM Conference on Geometric Design, Tempe, AZ, 1991, 1993

PROGRAM COMMITTEES

1. ACM SIGGRAPH Asia 2013-2014
2. Eurographics, 2012-13
3. IEEE VR 2013
4. ACM Symposium on Computational Geometry, 2012

5. Motion in Games, 2011
6. ACM/Eurographics Symposium on Geometric Processing, 2011-2013
7. ACM Solid and Physical Modeling, 2011-13
8. ACM SIGSPATIAL GIS, 2011-12
9. Shape Modeling, 2011-12
10. Pacific Graphics, 2011
11. Geometric Modeling and Processing, 2010
12. High Performance Graphics, 2009-2012
13. Workshop on Language, Compiler, and Architecture Support for GPGPU, 2010
14. Robotics: Science and Systems, 2009
15. Workshop on Exploiting Parallelism using Hardware-Assisted Methods, 2009
16. ACM Solid and Physical Modeling, 2003-2006, 2009-2011
17. EAA Auralization Symposium, 2009
18. ACM SIGGRAPH, 2007-2008
19. ACM SIGGRAPH Asia, 2008-09
20. Shape Modeling, 2009
21. IEEE Conference on Interactive Ray Tracing, 2006-2008
22. ACM Symposium on Interactive 3D Graphics and Games, 2007-2013
23. 3D Data Processing, Visualization and Transmission 2006-2008
24. Robotics: Science and System: 2006-2008
25. ACM SIGGRAPH/Eurographics Workshop on Computer Animation, 2003-2010, 2012-2013
26. ACM SIGGRAPH/Eurographics Workshop on Graphics Hardware, 2004-20010
27. Computer Animation and Social Agents, 2003-2009
28. ACM/Eurographics Symposium on Geometry Processing, 2003-20013
29. Computer Graphics International, 1998-2005
30. Eurographics, 2002-2004
31. Pacific Graphics, 2004-2010
32. International Symposium on 3D Data Processing, Visualization and Transmission, 2004-2008
33. X Mathematics of Surfaces Conference, England, 2003
34. IEEE Visualization, 2001-2002, 2008-2010
35. IEEE VR Conference, 2000-2002
36. Computer Animation, 2001-2002
37. ACM SIGGRAPH, 2000
38. Indian Conference on Computer Vision, Graphics and Image Processing, 2000
39. Workshop on Algorithmic Foundations of Robotics, 2000
40. ACM Symposium on Solid Modeling, Ann Arbor, MI, 1997-2001
41. International Association of Science and Technology for Development (IASTED), Computer Graphics and Imaging, Canada, 1999
42. IEEE VRAIS'98 Conference, Atlanta, GA, 1998
43. 3rd ASME Design for Manufacturing Conference, Atlanta, GA 1998
44. ACM Symposium on Computational Geometry, Minneapolis, MN, 1998
45. International Association of Science and Technology for Development (IASTED), Computer Graphics and Imaging, Canada, 1998
46. Constructive Solid Geometry'98, Winchester, England, 1998
47. IEEE VRAIS'97 Conference, Albuquerque, NM, 1997
48. ACM Symposium on Computational Geometry, Nice, France, 1997
49. Workshop on Collaborative CAD, Atlanta, GA, 1997
50. VRST'96 Conference, Hong Kong, 1996
51. IEEE VRAIS'96 Conference, San Francisco, 1996
52. Constructive Solid Geometry (CSG)'96 Conference, Winchester, England, 1996
53. 2nd IEEE Computer Society Workshop on Shape and Pattern Matching in Computational Biology, Boston, MA, 1995

PANELS

- NSF Panels on New Technologies, Visualization, Geometric Computing, CPA, Compilers, Graphics, Engineering Design, SBIR.
- NSF CISE Infrastructure Awards.

Courses, Tutorials and Mini-Symposiums

1. *Recent Advances in Real-Time Collision and Proximity Computations for Games and Simulations* (with S. Yoon, Y. Kim, E. Coumans and R. Tonge), ACM SIGGRAPH 2010
2. *Interactive Sound Rendering (with M. Lin, N. Tsingos, L. Savioja and P. Calamia*) ACM SIGGRAPH 2009
3. *Topologically Robust Computations in Geometric Modeling (with V. Shapiro, H. Edelsbrunner, T. Day and V. Pascucci)* SIAM/ACM Symposium on Solid and Physical Modeling, 2009.
4. *Interactive Massive Model Rendering & Ray Tracing (with S. Yoon, D. Kasik, E. Gobbetti, R. Pajarola and P. Slusallek),* IEEE Visualization 2009
5. *State of the Art in Massive Model Visualization (with D. Kasik, B. Bruderlin, W. Correa, A. Dietrich, S. Yoon and P. Slusallek)* ACM SIGGRAPH 2007, 2008, ACM SIGGRAPH Asia, 2008.
6. *State of the Art in Interactive Ray Tracing* (with P. Shirley, I. Wald, W. Mark and P. Slusallek) ACM SIGGRAPH 2006.
7. *Query Co-Processing on Commodity Processors* (with A. Ailamaki, N. Govindaraju and S. Harizopoulos), VLDB 2006. 1267
8. *Query Co-Processing on Commodity Processors* (with A. Ailamaki, N. Govindaraju and S. Harizopoulos), ICDE 2006.
9. *Realtime Interactive Massive Model Visualization* (with D. Kasik, I. Wald, B. Bruderlin, W. Correa, E. Gobbetti, Al. Hubrecht and P. Slusallek) Eurographics 2006.
10. *Query Co-processing on Commodity Hardware,* Co-organizer (with N. Govindaraju and Anastassia Ailamaki), International Conference on Data Engineering, 2006.
11. *Collision handling in dynamic simulation Environments,* Co-organizer (with M. Trescher), Eurographics*, 2005.*
12. *Interactive Geometric and Scientific Computations using Graphics Hardware,* Course Organizer, SIGGRAPH, 2003.
13. *Interactive Geometric Computations with Graphics Hardware*, Course Organizer, ACM SIGGRAPH, 2002.
14. *Handling Large Datasets: Interactive Walkthroughs and Proximity Queries*, Co-Organizer with Ming C. Lin, ACM Solid Modeling, 2002.
15. *Interactive Walkthroughs of Large Geometric Datasets*, Course Organizer, ACM Solid Modeling, 2001.
16. *Interactive Walkthroughs of Large Geometric Environments*, Co-Organizer with Daniel Aliaga, ACM SIGGRAPH, 2000.
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DEPARTMENT COMMITTEES

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COURSES TAUGHT

- COMP122: Design and Analysis of Algorithms
- COMP136/COMP575: Introduction to Computer Graphics

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- COMP236/770: Computer Graphics
- COMP258: Geometric and Solid Modeling
- COMP259/768: Physically-based Modeling
- COMP290: Advances in Modeling
- COMP290: Rendering Curved Surfaces
- COMP290/790: Robot Motion Planning
- COMP290: General Purpose Computation using Graphics Processors
- COMP 990: Sound Rendering

SOFTWARE SYSTEMS

1. I-COLLIDE (1995) Collision Detection System: A polyhedral collision detection system developed by J. Cohen, M. Lin, D. Manocha, B. Mirtich, K. Ponamgi and J. Canny. More than 15,000+ users have ftp'ed the code. The underlying technology has been licensed to Mechanical Design Inc., Division Inc., and Knowledge Revolution. Also used by researchers at Ford Motor Company, Intel, GE, White Sands Missile Range, Lockheed Martin, etc.
2. Polygon Triangulation Utility (1995) Developed by A. Narkhede and D. Manocha. More than 5700+ users worldwide have ftp'ed the code.
3. SPEED Rendering System (1996) A rendering system for interactive display of large NURBS models, developed by S. Kumar and D. Manocha
4. RAPID (1996) Interference Detection System: A general purpose polygonal interference detection system developed by S. Gottschalk, M. Lin and D. Manocha. More than 22,000 users have ftp'ed the code. The underlying technology has been licensed to Division Inc. Also used by researchers at ABB Engineering, Intel, Ford, White Sands Missile Range, etc.
5. V-COLLIDE (1997) Collision Detection System: A general purpose collision detection system for general large environments developed by J. Cohen, S. Gottschalk, T. Hudson, A. Pattekar, M. Lin and D. Manocha. More than 18,000 downloads.
6. BOOLE (1997) Solid Modeling System: An accurate solid modeling system for spline models developed by S. Krishnan, D. Manocha, A. Narkhede and J. Keyser. The system was being integrated with BRL-CAD, a public domain solid modeling system with more than 900 users worldwide. Also used by researchers at Air Force Labs.
7. KINEM (1998) Inverse Kinematics Utility: An inverse kinematics utility for general serial manipulators. The system has been used by researchers at Pratt & Whitney, Silma Inc. and Adelph Technologies..
8. MARS (1998) Equation Solver: A zero dimensional equation solver using Matlab and Maple. Developed by A. Wallack, I. Emiris and D. Manocha.
9. MAPC (1999) Library: A package to represent and manipulate algebraic points and curves. Developed by J. Keyser, T. Culver, D. Manocha and S. Krishnan.
10. PQP (1999) Proximity Query System: A general purpose proximity query system for collision detection, distance computation and tolerance queries. Developed by E. Larsen, S. Gottschalk, M. Lin and D. Manocha. 23,000+ downloads.
11. PIVOT (2001) Proximity queries using graphics hardware. It provides support for different proximity queries. Developed by K. Hoff, A. Zaferakis, M. Lin and D. Manocha. 1800+ downloads.
12. DEEP (2002) A package for collisions and penetration computation between convex primitives. Developed by Y. Kim, M. Lin and D. Manocha. 450+ downloads as of July'06.
13. HAVOC (2003): A GPU-based library to compute distance fields of 3D objects and proximity query applications.400+ download till.
14. GPUSORT (2005): A GPU-based Sorting algorithm and library. More than 2800 downloads..
15. OpenCCL (2005): A library to compute cache-oblivous layouts of larges meshes and graphs. More than 600+ downloads.

16. LUGPULIB (2005): A library to compute LU decomposition of dense matrices using graphics hardware. 1500+ downloads.
17. GPUFFTW (2006): A library to compute 1D FFT using GPUs. 2200+ downloads.
18. DeformCD (2007): A library for collision detection between deformable models, 150+ downloads.
19. RVOLibrary (2008): A library for multi-agent simulation, 3,600+ downloads
20. HVRO Library (2009): A library for independent navigation of robots, 120+ downloads
21. SELFCCD (2010): A self-collision library for deformable models. 160+ downloads
22. FCL (2011): A general purpose collision detection library available as part of ROS
23. MCCD (2012): Multi-core, parallel collision detection library

PUBLICATIONS

Published more than 350 refereed papers in leading conferences and journals in Computer Graphics, Robotics, CAD/CAM, Virtual Reality, Databases, Multimedia, Symbolic Computation, Computational Biology and Computational Geometry. More than 19,000 citations as per Google Scholar. Detailed citation information is available at:

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Books and Monographs

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2. *Applications of Computational Algebraic Geometry*, by David Cox, Bernd Sturmfels, Dinesh Manocha, Thomas Sederberg, Xenia Kramer, Rienhard C. Laubenbaches, Rekha Thomas and John Little, American Mathematical Society, 1997.

3. *Proceedings of Pacific Graphics,* edited by Dinesh Manocha, Craig Gotsman and Enhua Wu. Published as special issue of Visual Computer. 2005.

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13. R. Mehra, N. Raghuvanshi, L. Antani, A. Chandak, S. Curtis, and D. Manocha, "Wave-based Sound Propagation in Large Open Scenes using an Equivalent Source Formulation", *ACM Trans. on Graphics,* (ACM SIGGRAPH), 12 pages, 2013.

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380. J. Cohen, M. Lin, D. Manocha and K. Ponamgi (1994). "Efficient collision detection for interactive environments." *Proc. of 10th ACM Computational Geometry Conference*, Video Publication, pp. 391-392, Stony Brook, NY.

GRADUATE STUDENTS

Currently Supervised

1. Aniket Bera
2. Sean Curtis
3. Ravish Mehra
4. Qi Mo
5. Nicolas Morales
6. Asad Naweed
7. Jia Pan
8. Chonhyon Park
9. Micah Taylor

Ph.D. Students Graduated

1. Lakulish Antani (Ph.D. Summer'13) First Appointment: Impulsonic Inc.
2. Jonathan Cohen (Ph.D. December '98). First Appointment: Assistant Professor at Johns Hopkins University. Currently a senior research scientist, Lawrence Livermore Labs.
3. Anish Chandak (Ph.D. December '11). First Appointment: Impulsonic Inc.
4. Tim Culver (Ph.D. Fall'00). First Appointment: Think3 Inc. Currently, a senior technical staff member, Autodesk.
5. Carl Erikson (Ph.D. Spring'00). First Appointment: BOPS Inc. Currently self-employed.
6. Russell Gayle (Ph.D. Spring'10; Co-Supervised with Ming Lin). First Appointment: Google. Currently at Sandia National Labs.
7. Stefan Gottschalk (Ph.D. Summer'00; Co-Supervised with Ming Lin). First Appointment: Nvidia Inc.
8. Naga Govindraju (Ph.D. Summer'04). First Appointment: Research Assistant Professor, UNC Chapel Hill. Currently a principal researcher at Microsoft.
9. Stephen Guy (Ph.D. Summer'12). First Appointment: Assistant Professor, University of Minnesota.
10. John Keyser (Ph.D. Summer'00). First Appointment: Assistant Professor at Texas A&M University. Currently a Tenured Professor of Computer Science.
11. Shankar Krishnan (Ph.D. July '97). Member of Technical Staff, AT&T Research Labs. Currently, head of graphics/vision research group at AT & T Labs.
12. Subodh Kumar (Ph.D. Fall '96). First Appointment: Assistant Professor, Johns Hopkins University. Currently a professor of Computer Science and Engineering, IIT Delhi, India.
13. Christian Lauterbach (Ph.D. Fall'10). First Appointment: Google Inc.
14. Brandon Lloyd (Ph.D.Fall'07). First Appointment: Microsoft.
15. Paul Merrell (Ph.D. Fall'09). First Appointment: Postdoc, Stanford University. Currently at Google.
16. Jamie Snape (Ph.D. Fall'12). First Appointment (Kitware)
17. Avneesh Sud (Ph.D. Fall'06). First Appointment, Postdoc, UNC Chapel Hill. Currently a researcher at Microsoft.
18. Gokul Varadhan (Ph.D. Fall'05): First Appointment: Google Inc.
19. Andrew Wilson (Ph.D. Fall'02). First Appointment: Sandia National Labs

20. Sungeui Yoon (Ph.D. Fall'05): First Appointment: Lawrence Livermore Labs. Currently an Associate Professor of Computer Science, KAIST, S. Korea.
21. Hansong Zhang (Ph.D. Fall '98). First Appointment: Silicon Graphics. Currently at a startup.
22. Liangjun Zhang (Ph.D. Summer'09). First Appointment: NSF CI-Fellow, Stanford University. Currently at Samsung Research.

M.S. Students Graduated

1. Bill Baxter (M.S. Spring'01): OLM Digital
2. Sean Curtis (M.S. Spring'08): Disney Animation
3. Mark Foskey (M.S. Spring'01). First Appointment: Research Faculty at UNC Chapel Hill
4. Sean Hanlon (M.S. Spring'05): Constella Group
5. Mark Harris (M.S. Spring'00): NVIDIA
6. Karl Hillesland (M.S. Spring'02): ATI
7. Tom Hudson (M.S. Summer'97). UNC Wilmington
8. Kenny Hoff (M.S. Summer'99). Silicon Graphics
9. Wesley Hunt (M.S. Spring'00): iRock Inc
10. Nitin Jain (M.S. Spring'05): Oracle
11. Eric Larsen (M.S. Spring'99). Sony
12. Sang Woo Lee (M.S. Spring'09). Game Company
13. Gopi Meenakshi (M.S. Spring'99): UC Irvine
14. Atul Narkhede (M.S. Spring '95). Silicon Graphics
15. David O'Brien (M.S. Spring'01): UNC Chapel Hill
16. Amol Pattekar (M.S. Spring'98). Yahoo Inc.
17. Sachin Patil (M.S. Spring'09). UNC Chapel Hill
18. Kris Ponamgi (M.S. Fall '95). Virtus Inc.
19. Zhimin Ren (M.S. Spring'2010). UNC Chapel Hill
20. Brian Salomon (M.S. Fall'07): NVIDIA
21. TVN Sriram (Spring'06): Google
22. Kyle Wilson (M.S. Summer '97). Interactive Magic
23. Andrew Zaferakis (M.S. Spring'02). TriLunar Inc.
24. Yu Zheng (M.S. Fall'2011). Disney Research.

POSTDOCS & VISITNG RESEARCHERS

Currently Supervised

1. Xinyu Zhang
2. Jae-Ho Nah

Previously Supervised

1. Jur van der Berg (co-supervised with Ming C. Lin)
2. Mark Foskey (Co-Supervised with Ming C. Lin). Research Assistant Professor, UNC Chapel Hill.
3. Naga Govindaraju. Microsoft.
4. Young Kim (Co-Supervised with Ming C. Lin). Assistant Professor, Enwa University, S. Korea.
5. Vivek Kwatra (Co-Supervised with Ming C. Lin). Google Research, California.
6. Avneesh Sud (Co-Supervised with Ming C. Lin). Microsoft
7. Gokul Varadhan: Currently a member of Technical Staff at Google Inc.
8. Min Tang. Associate Professor, Zhejiang University, China.

PH.D. COMMITTEES & EXTERNAL REVIEWERS

1. Rui Bastos (Ph.D. 1999)
2. Michael Bajura (Ph.D. 1997)
3. Deepak Bandophaday (Ph.D. 2005)
4. William Baxter (Ph.D. 2004)
5. David Chen (Ph.D. 1998)
6. Fredo Durand (Univ. of Grenoble, France) (Ph.D. 1999)
7. David Eberly (Ph.D. 1994)
8. Jacob Furst (Ph.D. 1999)
9. Nico Gallopo (Ph.D. 2008)
10. Karl Hillesland (Ph.D. 2005)
11. Jesse Cooper Himmelstein (University of Toulouse, Ph.D. 2008)
12. Rong Guodong (National University of Singapore, Ph.D. 2008)
13. Martin Isenburg (Ph.D. 2004)
14. Robert Katz (Ph.D. 2002)
15. Ted Kim (Ph.D. 2006)
16. Hanna Kurniawati (National University of Singapore, Ph.D. 2008)
17. Kok-Lim Low (Ph.D. 2005)
18. Yunshan Liu (in progress)
19. David Luebke (Ph.D. 1998)
20. Ajith Masceranhas (Ph.D. 2005)
21. Bruce Merry (University of Cape Town, Ph.D. 2007)
22. Manfred Minimair (Math Department, NC State, Spring 2001)
23. David Millman (in progress)
24. Rahul Narain (Ph.D. 2011)
25. Miguel Otaduy (Ph.D. 2004)
26. Sachin Patil (in progress)
27. Jeff Poole (in progress)
28. Voicu Popescu (Ph.D. 2001)
29. Cory Quammen (in progress)
30. John Rhoades (Ph.D. 1993)
31. Nikunj Raghuvanshi (Ph.D. 2010)
32. David Rogers (INRIA, Grenoble, Ph.D. 2008)
33. Jason Sewall (Ph.D. 2011)
34. Paul Segars (Bio-Medical Engineering Department) (Ph.D. 2001)
35. Timothy Terriberry (Ph.D. 2006)
36. Andrew Thall (Ph.D. 2004)
37. Adrian Theetten (INRIA, Ph.D. 2007)
38. Amitabh Varshney (Ph.D. 1994)
39. Kelly Ward (Ph.D. 2005)
40. Li Yi (Simon Fraser University, Ph.D. 2008)
41. Yunshan Zhu (Ph.D. 1998)

M.S. COMMITTEES

- Daniel Aliaga (M.S. 1993)
- Audra Sugerman (M.S. 1995)
- Atul Narkhede (M.S. 1995)

- Kris Georges (M.S. 1995)

REFEREE FOR

- ACM Transactions on Graphics
- Journal of Symbolic Computation
- Computer Vision, Graphics and Image Processing
- Presence
- IEEE Computer Graphics and Applications
- Computer
- Computer-Aided Design
- Computer Aided Geometric Design
- SIAM Journal on Computing
- Applicable Algebra in Engineering, Communication and Computing
- Journal of Robotics System
- International Journal of Computational Geometry and Applications
- IEEE Transactions on Robotics and Automation
- IEEE International Conference on Robotics and Automation
- Computer Graphics Forum
- IEEE/ACM SuperComputing
- ACM SIGGRAPH
- ACM Interactive 3D Graphics Conference
- ACM/SIGGRAPH Solid Modeling Conference
- ACM Volume Visualization Symposium
- IEEE Visualization
- Graphics Interface
- EuroGraphics
- AAECC (Applied Algebra and Error Correcting Codes)
- ACM Symposium on Computational Geometry
- International Conference on Robotics & Automation
- International Symposium on Symbolic and Algebraic Computation
- Army Research Office Proposals
- National Science Foundation Proposals
- National Research Council

INVITED COLLOQUIA

- **Interactive Sound Rendering**
  1. University of Wisconsin, May 2012
  2. KAUST, S. Arabia, February, 2011
  3. University College London, February 2011
  4. Department of Computer Science, NYU, October 2010
  5. Technical University of Catalonia, Barcelona, July 2010
  6. Department of Computer Science, Technical University of Vienna, April 2010
  7. Department of Computer Science, Columbia Univ., February 2010
  8. Department of Computer Science, UNC Charlotte, February, 2010

- **Interactive Large-Scale Crowd Simulation**

  1. Department of Computer Science, Helsinki Institute of Technology, Finland, November 2012
  2. Department of Computer Science, Universidade Federal do Rio de Janeiro, July 2012
  3. IMPA - Instituto de Matematica Pura e Aplicada, July 2012
  4. Department of Computer Science, Universidade de São Paulo, June 2012
  5. Department of Computer Science, ETH Zurich, June 2012
  6. Julisch SuperComputing Center, Germany, November 2011
  7. Department of Computer Science, City University of New York, October 2010
  8. Department of Computer Science, Hong Kong University, April 2010
  9. Department of Computer Science, City University of Hong Kong, March 2010
  10. Department of Computer Science, Chinese University of Hong Kong, April 2010

- **Bringing Realism to Virtual Environments: Physics, Sound and Crowd**
  1. Department of Computer Science, KAIST, September 2008
  2. AT & T Research Labs, NJ, November, 2008
  3. Department of Computer Science, Univ. of Central Florida, February, 2009
  4. Department of Computer Science, Texas A & M, June 2009

- **Motion Planning in Real and Virtual Worlds: Algorithms and Applications**
  1. University of Maryland, April 2011
  2. University of Tokyo, February 2008
  3. Simon Fraser University, July 2008
  4. Korea Institute of Science and Technology, September 2008
  5. University of Pennsylvania, October 2006.
  6. Rensselaer Polytechnic Institute, October 2006.

- **Interactive Ray Tracing and Sound Rendering in Complex, Dynamic Environments**
  7. Department of Computer Science, Indian Institute of Technology, Delhi (April 2008)
  8. ACM SIGGRAPH Course, Los Angeles (August 2008)
  9. Department of Computer Science, Seoul National University (September 2008)

- **Interactive Rendering of Massive Models: Rasterization or Ray Tracing**
  1. Aiya Napa Seminar, Cyprus, June 2006
  2. Department of Computer Science, University of Stuttgart, July 2006

- **Discrete Geometric Processing with Topological Guarantees**
  1. SUNY Stony Brook, June 2008
  2. Peking University, June 2007
  3. Tsinghua University, June 2007
  4. University of Minnesotta, May 2007

- **Real-Time Display & Walkthroughs of Massive Models**
  1. Pacific Graphics, October 2005
  2. Institute of Creative Technologies, September, 2004.
  3. Department of Computer Science, ETH, Swiss Federal Institute of Technology, Zurich, July 2004.
  4. ONR PI Meetings, Naval Research Labs, 2000-2004
  5. Department of Computer Science, University of Maryland, May 2003.

6. Intel, Oregon, August 2002.
7. ARMY STRICOM, March 2000.
8. Department of Computer Science, USC, February 2000.
9. Department of Computer Science, UCSD, November 1999.
10. Institute of Creative Technologies, USC, November 1999.
11. Department of Computer Science, UCLA, May 1999.
12. Lawrence Livermore National Labs, Livermore, March 1999.
13. Department of Computer Science, New York University, October 1998.
14. NASA Ames, Mountain View, CA, August 1998.
15. Interval Research, Palo Alto, CA, July 1998.
16. Hewlett-Packard Research Labs, Palo Alto, CA, June 1998.
17. Intel, Santa Clara, CA, June 1998.

- **General Purpose Computation using Graphics Processors**
  1. Institute for Infocomm Research, ASTAR, Singapore, November 2012
  2. NVIDIA, India, December 2011
  3. Computational Research Labs, Pune, India, December 2011
  4. Department of Computer Science, Zhejiang University, May 2011
  5. KAUST, May 2010
  6. Department of Computer Science, HKUST, March 2010
  7. Microsoft Research, Asia, June 2007
  8. Intel, Santa Clara, March 2007
  9. MATREX Meeting, RDECOM, February, 2006
  10. SAIC, November 2005
  11. Hong Kong University of Science and Technology (HKUST), October 2005
  12. Workshop on High Performance Embedded Computing, September 2005
  13. Intel, Santa Clara, August 2005
  14. Army Research Labs, July 2005
  15. Army Modeling and Simulation Office, July 2005
  16. High Performance Computing Symposium, June 2005
  17. MERL, Cambridge, MA, June 2005
  18. Army CERDEC, New Jersey, June 2005
  19. Department of Computer Science, University of California at Irvine, September 2004.
  20. National Simulation Center, February 2004
  21. Intel, Oregon, October 2003.
  22. I/ITSEC, November 2004
  23. PEO STRI, May 2003
  24. RDECOM, STTC, Orlando, May 2003

- **Exact and Accurate Computations with non-linear Algebraic primitives**
  - Max-Planck Institute, Saarbrucken, Germany, June 2002.

- **Collision Detection between Rigid and Deformable Models**
  - Workshop on Surgical Simulation, Stanford, CA, 2001.

- **MultiPolynomial Resultants: Algorithms, Implementation and Applications**
  1. US Naval Academy, Annapolis, MD, May 1996.
  2. Invited speaker, East Coast Computer Algebra Day, IBM TJ Watson Research Center, April 1996.

- **Collision Detection: Algorithms and Applications**
  - Invited minisymposium speaker, SIAM Conference on Geometric Design, November 1995.

- Second Workshop on Algorithmic Robotics, Toulouse, France, July 1996.

- **Towards Interactive Walkthrough of large CAD models**
  1. National Institute of Standards and Technology, Gaithersburg, MD, March 1997.
  2. State University of New York at Stony Brook, March 1997.
  3. University of Michigan, Ann Arbor, MI, March 1997.
  4. Northwestern University, February, 1997.
  5. National Institute of Standards and Technology, Gaithersburg, MD, June 1995.
  6. Workshop on Geometric Software and Visualization, Princeton, NJ, June 1996.
  7. Invited speaker, Graphicon'96 conference, St. Petersburg, July 1996.
  8. Invited speaker, First CGC Workshop on Computational Geometry, John Hopkins University, October 1996.

- **Modeling and Rendering with Algebraic Constraints**
  1. AT&T Bell Labs, Murray Hill, NJ, May 1995.
  2. University of California at Davis, CA, April 1995.
  3. Naval Postgraduate School, Monterey, CA, April 1995.
  4. Princeton University, Princeton, NJ, April 1995.
  5. University of Utah, Salt Lake City, UT, March 1995.
  6. University of Florida, Gainesville, FL, March 1995.

- **Interactive Model Construction, Display and Collision Detection for Virtual Environments**
  - ONR PI's meeting, Arlington, VA, March 1995.

- **Geometric Problems in the Non-linear World**
  - Invited speaker, Geometry software workshop, University of Minnesota, MN, January 1995.

- **Geometric and Solid Modeling**
  - Invited colloquium, Indian Institute of Technology, N. Delhi, India, January 1994.

- **Non-Linear Polynomial Equations and Matrix Computations**
  - Invited speaker, “Advances in Computational Mathematics”, N. Delhi, India, January 1994.

- **Surface Intersection in Lower Dimensions**
  - Invited minisymposium speaker, SIAM Conference on Geometric Design, Tempe, AZ, November 1993.

- **Modeling with Algebraic Constraints**
  1. University of Geneva, Geneva, Switzerland, June 1993.
  2. INRIA, Nice, France, June 1993.
  3. Department of Computer Science, Duke University, Durham, NC, February 1993.
  4. Department of Computer Science, University of North Carolina at Chapel Hill, NC, February 1993.

- **Robust Methods for Curve and Surface Intersection**
  - Invited presentation, SPIE Conference on Curves and Surfaces for Computer Graphics and Vision, Boston, MA, November 1992.

- **Non-Linear Geometry and Linear Algebra**
  1. Mitsubishi Electric Research Lab, Cambridge, MA, April 1992.
  2. Department of Computer Science, University of North Carolina at Chapel Hill, NC, April 1992.
  3. School of Computer Science, Carnegie Mellon University, Pittsburgh, PA, April 1992.

4. College of Computing, Georgia Institute of Technology, Atlanta, GA, April 1992.
5. Department of Computer Science, University of Toronto, Toronto, Canada, March 1992.
6. Department of Computer Science, State University of New York, Stony Brook, NY, March 1992.
7. Department of Computer Science, University of Maryland at College Park, MD, March 1992.
8. Department of Computer Science, University of California at Santa Barbara, CA, March 1992.
9. Department of Computer Science, University of Minnesota, Minnesota, MN, March 1992.
10. Department of Computer Science, University of Waterloo, Waterloo, Canada, March 1992.
11. Department of Computer and Information Science, University of California at Santa Cruz, CA, February 1992.
12. IBM TJ Watson Research Center, Yorktown Heights, NY, February 1992.

- **Algorithms for curve and surface intersections**
  - Invited colloquium, Xerox Palo Alto Research Center, Palo Alto, CA, February 1992.

- **Efficient techniques for implicitization**
  - Invited presentation, Minisymposium on Base Points and Computer Aided Geometric Design, SIAM Conference on Geometric Design, Tempe, AZ, November 1991.

- **Real time inverse kinematics for general 6R manipulators**
  - Invited colloquium, Department of Computer Science, Stanford University, Palo Alto, CA, October 1991.

- **A New Approach for Curve and Surface Intersection**
  - Invited colloquia, Hewlett-Packard Research Laboratories, Palo Alto, CA, March 1991.

- **Efficient Algorithms for Inverse Kinematics**
  - Invited Speaker at Industrial Liasion Program, College of Engineering, University of California, Berkeley, CA, March 1991.

- **Implicitizing Rational Parametric Surfaces**
  - Invited Workshop speaker, Geometric Design Seminar, Wayne State University, Detroit, MI, May 1990.

- **Regular Curves and Proper Parameterizations**
  - Invited colloquium, Indian Institute of Technology, Delhi, January 1990.

- **Multipolynomial Resultant Algorithms**
  - Invited presentation, Minisymposium on Computational Algebraic Geometry and Geometric Modeling, SIAM conference on Geometric Design, Tempe, Arizona, November 1989.