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Education

- Ph.D.**, University of North Carolina at Chapel Hill, December 1997
Title: Efficient and Accurate Boundary Evaluation Algorithms for Sculptured Solids, *Advisor:* Dinesh Manocha
- M.S.**, University of North Carolina at Chapel Hill, May 1993 (Computer Science).
Title: Synthesis of Low Power Finite State Machines,
Advisor: Akhilesh Tyagi
- B.Tech**, Indian Institute of Technology, Madras, India, May 1991 (Computer Science).

Research Interests

- 3D Computer Graphics, Image-Based Rendering.
- Multiview geometry and Computer Vision.
- Computational Geometry.
- General-purpose computing on the GPU (GPGPU).
- Robustness in Geometric Computing.
- Information Visualization and Data Mining.
- 3D NURBS Modeling, Surface Interrogation problems, Algorithmic Algebra.

Publications

Journal Papers

- S. Krishnan, P. Y. Lee, J. B. Moore and S. Venkatasubramanian. *Optimisation-on-a-manifold for global registration of multiple 3D point sets*, International Journal of Intelligent Systems Technologies and Applications (IJISTA), Vol. 3, No. 3/4, Pages 319–340, 2007.
- N. H. Mustafa, S. Krishnan, G. Varadhan, and S. Venkatasubramanian. *Dynamic Simplification and Visualization of Large Maps*, International Journal of Geographical Information Science (IJGIS), Volume 20, Number 3, Pages 273–302, March 2006.
- S. Krishnan, N. H. Mustafa, and S. Venkatasubramanian. *Statistical Data Depth and the Graphics Hardware*, In Data Depth: Robust Multivariate Analysis, Computational Geometry and Applications, Editors: Regina Y. Liu, Robert Serfling and Diane L. Souvaine, DIMACS Series in Discrete Mathematics and Theoretical Computer Science, Volume 72, Pages 223–246, 2006.

- G. Varadhan, S. Krishnan, T. V. N. Sriram and D. Manocha. *Complete Motion Planning Algorithm of Translating Polyhedral Robots*, International Journal of Robotics Research, Volume 24, Issue 11, Pages 983–996, November 2005.
- J. Chhugani, B. Purnomo, S. Krishnan, J. Cohen, S. Venkatasubramanian, D. S. Johnson, S. Kumar. *vLOD: High-Fidelity Walkthrough of Large Virtual Environments*, IEEE Transactions on Visualization and Computer Graphics, Volume 11, Number 1, Jan. 2005.
- G. Varadhan, S. Krishnan, T. V. N. Sriram and D. Manocha. *A Simple Algorithm for Complete Motion Planning of Translating Polyhedral Robots*, Algorithmic Foundations of Robotics VI, Springer Tracts in Advanced Robotics, Editors: Michael Erdmann, David Hsu, Mark Overmars and Frank van der Stappen, Pages 441–456, 2005 (Book Chapter).
- J. Keyser, T. Culver, M. Foskey, S. Krishnan, D. Manocha. *ESOLID - A System for Exact Boundary Evaluation*, Computer-Aided Design (CAD), vol. 36, no. 2, Pages 175–193, 2004.
- T. Culver, J. Keyser, D. Manocha, S. Krishnan. *A Hybrid Approach for Determinant Signs of Moderate-Sized Matrices*, International Journal of Computational Geometry and Applications, Vol. 13, No. 5, Pages 399–417, October 2003.
- S. Krishnan, D. Manocha, M. Gopi, T. Culver, J. Keyser. *BOOLE: A Boundary Evaluation System for Boolean Combinations of Sculptured Solids*, International Journal of Computational Geometry and Applications, Vol. 11, No. 1, pp. 105-144, February 2001.
- S. Krishnan and D. Manocha. *Partitioning Trimmed Spline Surfaces into Non-Self-Occluding Regions for Visibility Computation*, Graphical Models, Vol. 62, No. 4, pp. 283–307, July 2000.
- J. Keyser, T. Culver, D. Manocha and S. Krishnan. *Efficient and Exact Manipulation of Algebraic Points and Curves*, Computer-Aided Design (CAD), Vol. 32, Issue 11, pp. 649–662, 2000.
- M. Gopi, S. Krishnan. *Surface Reconstruction based on Lower Dimensional Localized Delaunay Triangulation (To Appear)*, Proceedings of Eurographics 2000, Volume 19, Number 3, pages C467-C478.
- M. Gopi and S. Krishnan. *A Fast and Efficient Projection-Based Approach for Surface Reconstruction*, International Journal of High Performance Computer Graphics, Multimedia and Visualisation, Vol. 1, No. 1, pp. 1–12, 2000.
- B. Wei, C. Silva, E. Koutsofios, S. Krishnan, S. North. *Information Visualization with Large Displays*, IEEE Computer Graphics and Applications: Special Issue on Large Displays, Vol. 20, No. 4, pp. 50–54, July-August 2000.
- J. Keyser, S. Krishnan, D. Manocha. *Efficient and Accurate B-rep Generation of Low-Degree Sculptured Solids using Exact Arithmetic:I - Representations*, Computer-Aided Geometric Design (CAGD), 16(9), 841–859, October 1999.
- J. Keyser, S. Krishnan, D. Manocha. *Efficient and Accurate B-rep Generation of Low-Degree Sculptured Solids using Exact Arithmetic:II - Computations*, Computer-Aided Geometric Design (CAGD), 16(9), 861–882, October 1999.

- S. Krishnan, M. Gopi, M. Lin, D. Manocha, A. Pattekar. *Rapid and Accurate Contact Determination between Spline Models using ShellTrees*, Proceedings of Eurographics '98, Volume 17, Number 3, Pages C315–C326.
- S. Krishnan and D. Manocha. *An Efficient Surface Intersection Algorithm Based on Lower Dimensional Formulation*, ACM Transactions on Graphics, pp. 74–106, Vol. 16, No. 1, Jan. 1997.
- S. Krishnan, M. Gopi, D. Manocha, and M. Mine. *Interactive Boundary Computation of Boolean Combinations of Sculptured Solids*, Proceedings of Eurographics '97, Volume 16, Number 3, Pages C67–C78.
- D. Manocha and S. Krishnan. *Algebraic Pruning: A fast technique for curve and surface intersection*, *Computer-Aided Geometric Design*, 14 (9), Pages 823–845, 1997.
- D. Manocha and S. Krishnan. *Solving Zero and One Dimensional Algebraic Systems using Matrix Computations*, ACM SIGSAM Bulletin, Dec. 1996, Vol. 30, No. 4, pp. 4–21.
- S. Kumar, S. Krishnan, and D. Manocha. *Interactive Display of Large Solid Models for Walkthroughs*, IEEE Computer Graphics and Applications, March 1996, pp 9–11.

Conference Papers

- A. Archer and S. Krishnan. *Importance sampling via load-balanced facility location*, Proc. of 13th Conference on Integer Programming and Combinatorial Optimization, 2008 (To Appear).
- T. Dasu, S. Krishnan, S. Venkatasubramanian, and K. Yi. *An Information-Theoretic Approach to Detecting Changes in Multi-dimensional Data Streams*, Interface 2006, 38th Symposium on the Interface of Statistics, Computing Science, and Applications: Massive Data Sets and Streams, 2006.
- G. Varadhan, S. Krishnan, L. Zhang, and D. Manocha. *Reliable Implicit Surface Polygonization using Visibility Mapping*, Proceedings of 4th ACM/Eurographics Symposium on Geometry Processing, Pages 211–221, 2006.
- G. Varadhan, Y. Kim, S. Krishnan and D. Manocha. *Topology Preserving Approximation of Free Configuration Space*, IEEE International Conference on Robotics and Automation, Pages 3041–3048, 2006.
- S. Krishnan, P. Y. Lee, J. Moore and S. Venkatasubramanian. *Global Registration of Multiple 3D Point Sets via Optimization-on-a-Manifold*, Proceedings of 3rd ACM/Eurographics Symposium on Geometry Processing, Pages 187–196, 2005.
- Q. Fan, A. Efrat, V. Koltun, S. Krishnan, S. Venkatasubramanian. *Hardware Assisted Natural Neighbour Interpolation*, Proc. 7th Workshop on Algorithm Engineering and Experiments (ALENEX), 2005.
- D. S. Johnson, S. Krishnan, J. Chhugani, S. Kumar, S. Venkatasubramanian. *Compressing Large Boolean Matrices Using Reordering Techniques*, Proc. 30th International Conference on Very Large Databases (VLDB), Pages 13–23, 2004.

- G. Varadhan, S. Krishnan, T. V. N. Sriram, D. Manocha. *Topology Preserving Surface Extraction Using Adaptive Subdivision*, Proceedings of 2nd ACM/Eurographics Symposium on Geometry Processing, Pages 241–250, 2004.
- G. Varadhan, S. Krishnan, T. V. N. Sriram, D. Manocha. *A Simple Algorithm for Complete Motion Planning of Translating Polyhedral Robots*, Proc. of 6th International Workshop on Algorithmic Foundations of Robotics, Pages 399–414, 2004.
- S. Guha, S. Krishnan, S. Venkatasubramanian. *A Theoretical Case Study of Three Algorithms on the GPU: Depth Ordering, k-Selection and Matrix Multiplication*, Proc. of ACM Workshop on General-Purpose Computing on Graphics Processors (extended abstract), Pages C15–C15, 2004.
- G. Varadhan, S. Krishnan, Y. J. Kim, D. Manocha. *Feature-Sensitive Subdivision and Iso-Surface Reconstruction*, Proceedings of IEEE Visualization, Pages 99–106, 2003.
- G. Varadhan, S. Krishnan, Y. J. Kim, S. Diggavi, D. Manocha. *Efficient Max-Norm Distance Computation and Reliable Voxelization*, Proceedings of ACM/Eurographics Symposium on Geometry Processing, Pages 116–126, 2003.
- P. Agarwal, S. Krishnan, N. Mustafa, S. Venkatasubramanian. *Streaming Geometric Optimization using Graphics Hardware*, Proceedings of Eleventh Annual European Symposium on Algorithms, 2003.
- S. Guha, S. Krishnan, K. Munagala, S. Venkatasubramanian. *Application of the Two-Sided Depth Test to CSG Rendering*, Proceedings of ACM Siggraph Symposium on Interactive 3D Graphics, Pages 177–180, 2003.
- M. Gopi, S. Krishnan. *A Fast and Efficient Projection-Based Approach for Surface Reconstruction*, Proceedings of the fifteenth Brazilian Symposium on Computer Graphics and Image Processing (SIBGRAPI), 2002.
- J. Keyser, T. Culver, M. Foskey, S. Krishnan, D. Manocha. *ESOLID - A System for Exact Boundary Evaluation*, Proceedings of seventh ACM Conference on Solid Modeling and Applications, Pages 23–34, 2002.
- S. Krishnan, N. Mustafa, S. Venkatasubramanian. *Hardware-Assisted Computation of Depth Contours*, Proceedings of Thirteenth Annual ACM Symposium on Discrete Algorithms, Pages 558–567, 2002.
- M. Foskey, D. Manocha, T. Culver, J. Keyser, S. Krishnan. *Reliable Geometric Computations With Algebraic Primitives and Predicated*, Proceedings of the Workshop on Uncertainty in Geometric Computations, Sheffield, July 2001 (proceedings to appear 2002).
- N. Mustafa, E. Koutsofios, S. Krishnan, S. Venkatasubramanian. *Map Simplification in Hardware*, Proceedings of Seventeenth Annual ACM Symposium on Computational Geometry, Pages 50–59, 2001.
- S. Krishnan, M. Foskey, T. Culver, J. Keyser, D. Manocha. *PRECISE: Efficient Multiprecision Evaluation of Algebraic Roots and Predicates for Reliable Geometric Computations*,

Proceedings of Seventeenth Annual ACM Symposium on Computational Geometry, Pages 274–283, 2001.

- S. Krishnan, C. T. Silva, B. Wei. *A Hardware-Assisted Visibility-Ordering Algorithm With Applications to Volume Rendering*, Data Visualization 2001 - Eurographics/IEEE TVCG Symposium on Visualization, Editors: D. Ebert, J. M. Favre and R. Peikert, Pages 233–242, 2001.
- J. Keyser, T. Culver, D. Manocha and S. Krishnan. *MAPC: A library for Efficient and Exact Manipulation of Algebraic Points and Curves*, Proceedings of Fifteenth Annual ACM Symposium on Computational Geometry, Pages 360–369, 1999.
- J. Abello, S. Krishnan. *Navigating Graph Surfaces*, Fourth International Congress on Industrial and Applied Mathematics (ICIAM), 1999.
- S. Krishnan, A. Pattekar, M. Lin, D. Manocha. *Spherical shells: A higher-order bounding volume for fast proximity queries*, appeared in the 1998 Workshop on the Algorithmic Foundations of Robotics, March 1998.
- J. Keyser, S. Krishnan, D. Manocha, T. Culver. *Fast and Accurate Boundary Evaluation of Low-Degree Sculptured Solids*, Proceedings of the 8th IMA Conference on Mathematics of Surfaces, Volume 8, Pages 139–160, August 1998 (*Invited Paper*).
- J. Keyser, S. Krishnan, and D. Manocha. *Efficient B-rep Generation of Low Degree Sculptured Solids using Exact Arithmetic*, Proceedings of ACM/SIGGRAPH Symposium on Solid Modeling, Pages 42–55, 1997.
- S. Krishnan and D. Manocha. *Algebraic Loop Detection and Evaluation Algorithms for Curve and Surface Interrogations*, Proceedings of Graphics Interface, pp. 87–94, Toronto, Canada, May 1996.
- S. Krishnan and D. Manocha. *Computing Boolean Combinations of Solids Composed of Free-form Surfaces*, Proceedings of the 1996 ASME Design for Manufacturing Conference, pp. 610–621, August 18-22, 1996.
- S. Krishnan and D. Manocha. *Efficient representations and techniques for computing B-reps of CSG models with NURBS primitives*, Proceedings of CSG '96 - Set-theoretic Solid Modelling: Techniques and Applications, pp. 101–122, April 1996.
- S. Krishnan, S. Kumar and D. Manocha. *Representation, Boundary Computation and Fast Display of CSG Models with NURBS Primitives*, Proceedings of the 1996 IFIP workshop, May 1996.
- S. Krishnan and D. Manocha. *Numeric-Symbolic Algorithms for Evaluating One-Dimensional Algebraic Sets*, Proceedings of the International Symposium on Symbolic and Algebraic Computation, pp. 59–67, July 1995.
- S. Kumar, S. Krishnan, D. Manocha, and A. Narkhede. *High Speed and High Fidelity Visualization of Complex CSG Models*, Proceedings of the BCS International Conference on Visualization and Modeling, Pages 228–249, Leeds, UK, December 1995.

Patents

- A. Archer and S. Krishnan. *Importance sampling via load-balanced facility location*, Invention Disclosure No. 2006-2064 (patent pending).
- S. Krishnan, P. Y. Lee, J. Moore and S. Venkatasubramanian. *Global Registration of Multiple 3D Point Sets via Optimization on a Manifold*, Application No. 11/480044, Filed: June 30, 2006, AT&T Reference No.: 2005-0576.
- S. Krishnan, N. H. Mustafa and S. Venkatasubramanian. *Map Simplification System using Graphics Hardware*, Patent No. 6812925, Filed: Nov. 2, 2004.

Invited Talks and Tutorials

- Invited talk at Australian National University. *Tiling Three-Dimensional Space with Simplices*, March 2006.
- S. Guha, S. Krishnan and S. Venkatasubramanian. *Data Visualization and Mining on the GPU*, Tutorial at the 11th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining, Chicago, 2005 (www.acm.org/sigs/sigkdd/kdd2005/tutorial-data_vis_gpu.html).
- EPFL's Summer Research Institute Invited Talk Series, Lausanne, Switzerland: *Complete Motion Planning of Translating Polyhedral Robots*, 2004.
- Siggraph 2003 Course: *Interactive Geometric and Scientific Computations Using Graphics Hardware*, Organizer: Dinesh Manocha, Ming C. Lin. Lecturers: M. Doggett (ATI Research), M. Wloka (nVidia Corp.), T. Purcell (Stanford), Peter Schroder (Caltech), M. C. Lin, M. Pollefeys and D. Manocha (UNC-Chapel Hill), S. Krishnan (AT&T Labs), 2003.
- Siggraph 2002 Course: *Interactive Geometric Computations Using Graphics Hardware*, Organizer: Dinesh Manocha, Lecturers: M. Doggett (ATI Research), N. Greene and M. Kilgard (nVidia Corp.), M. C. Lin and D. Manocha (UNC-Chapel Hill), S. Krishnan (AT&T Labs), 2002.
- Dimacs Talk: *Implementing Geometric Algorithms using Graphics Hardware*, DIMACS Workshop on Implementation of Geometric Algorithms, 2002.
- Invited Talk: *Use of Higher Dimensional Sturm Sequences in Non-Linear Geometric Computation*, SIAM Annual Meeting, Toronto, 1998.
- Invited Talk: *Efficient and Reliable Computation with Algebraic Numbers for Geometric Algorithms*, NYU Seminar, 1998.

Professional Activities

- Program Committee, 2008 ACM Symposium on Solid and Physical Modeling.
- Program Committee, 15th Pacific Conference on Computer Graphics and Applications, Pacific Graphics 2007.
- Program Committee, 2007 ACM Symposium on Solid and Physical Modeling.

- Program Committee, 15th Annual Fall Workshop on Computational Geometry, 2005.
- Program Committee, 13th Pacific Conference on Computer Graphics and Applications, Pacific Graphics 2005.