



- 1987-           • University of Michigan, Ann Arbor  
Electrical Engineering and Computer Science Department  
Variously Teaching Assistant and Research Assistant
  
- 1984-           • Jadavpur University, Calcutta  
Mathematics Department  
Lecturer
  
- 1982-           • Vidyasagar College, Calcutta  
Mathematics Department  
Lecturer
  
- 1979-           • Indian Statistical Institute, Calcutta  
Statistics-Mathematics Division  
Research Fellow

## PUBLICATIONS\*

### • Journal Articles/Book Chapters

C. Chuon, S. Guha, P. Janecek, N. D. C. Song, “SimpliPoly: Curvature-based Polygonal Curve Simplification,” submitted to *International Journal of Geographical Information Science*, 2009.

S. Guha, K. T. Khánh, “Recognizing Convex Polygons with Few Finger Probes using Range Trees,” *Pattern Analysis and Applications*, **12** (2009), 193-199.

C. Chuon, S. Guha, “Individual Profile Graphs for Location Management in PCS Networks,” *Computer Communications*, **31** (2008), 3337-3343.

C. Chuon, S. Guha, “DIP-MIP: Distributed Individual Paging Extension for Mobile IP in IP-Based Cellular Networks,” *Computer Communications* **30** (2007), 1178-1186.

S. Guha, “Joint Separation of Geometric Clusters and the Extreme Irregularities of Regular Polyhedra,” *International Journal of Computational Geometry and Applications* **15** (2005), 491-510.

S. Guha, S. D. Tran, “Reconstructing Curves without Delaunay Computation,” invited submission *Algorithmica* **42** (2005), 75-94.

*Published software*: “PointsNBoxes: 3d curve reconstruction software,”

<http://www.cs.ait.ac.th/~guha/PointsNBoxes/>.

A. Dumitrescu, S. Guha, “Extreme Distances in Multicolored Point Sets,” *Journal of Graph Algorithms and Applications* **8** (2004), 27-38.

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\*Recent publications are available on-line at <http://www.cs.ait.ac.th/~guha/>. For others please send me mail.

- T. K. Dey and S. Guha, "Transforming Curves on Surfaces," invited submission *Journal of Computer and System Sciences*, Special Issue on the 36th IEEE Symposium on the Foundations of Computer Science, edited by P. Agarwal, S. Cook, and S. Plotkin, **58** (1999), 297-325.
- T. K. Dey, H. Edelsbrunner, S. Guha, and D. V. Nekhayev, "Topology Preserving Edge Contractions," *Publications de l'Institut Mathematique (Beograd)* **66** (1999), 23-45.
- T. K. Dey, H. Edelsbrunner, and S. Guha, "Computational Topology," chapter in book *Contemporary Mathematics (223): Advances in Discrete and Computational Geometry*, edited by B. Chazelle, J. E. Goodman, and R. Pollack, American Mathematical Society, 1999, 109-143.
- T. K. Dey and S. Guha, "Computing Homology Groups of Simplicial Complexes in  $\mathbf{R}^3$ ," *Journal of the ACM* **45** (1998), 266-287.
- S. Guha, "Optimal Mesh Algorithms for Proximity and Visibility Problems in Simple Polygons," *Parallel Algorithms and Applications* **13** (1998), 167-185.
- N. Folwell, S. Guha, and I. Suzuki, "A Practical Algorithm for Integer Sorting on a Mesh-Connected Computer," *Parallel Algorithms and Applications* **12** (1997), 265-278.
- S. Guha and I. Suzuki, "Proximity Problems for Points on a Rectilinear Plane with Rectangular Obstacles," *Algorithmica* **17** (1997), 281-307.
- D. Z. Chen and S. Guha, "Testing a Simple Polygon for Monotonicity Optimally in Parallel," *Information Processing Letters* **47** (1993), 325-331.
- S. Guha, "An Optimal Parallel Algorithm using Exclusive Read/Writes for the Rectilinear Voronoi Diagram," *Computational Geometry: Theory and Applications* **3** (1993), 37-52.
- M. T. Goodrich, S. B. Shauck, and S. Guha, "Parallel Methods for Visibility and Shortest Path Problems in Simple Polygons," *Algorithmica* **8** (1992), 461-486; with an Addendum in *Algorithmica* **9** (1993), 515-516.
- A. Sen, H. Deng, and S. Guha, "On a Graph Partitioning Problem with Applications to VLSI Layout," *Information Processing Letters* **43** (1992), 87-94.
- S. Guha, "Parallel Computation of Internal and External Farthest Neighbors in Simple Polygons," *International Journal of Computational Geometry and Applications* **2** (1992), 175-190.
- S. Guha and A. Sen, "Expected Time Analysis of Interpolation Merge – a Simple New Merging Algorithm," *Information Processing Letters* **40** (1991), 277-281.
- S. Guha and S. Padmanabhan, "A New Derivation of the Generating Function for the Major Index," *Discrete Mathematics* **81** (1990), 211-215.
- A. Mukherjee and S. Guha, "On Generalized Stiefel Manifolds," *Indian Journal of Pure and*

*Applied Mathematics* **17** (1986), 890-894.

S. Guha and A. Sen, “On Fault-Tolerant Distributor Communication Architecture,” *IEEE Transactions on Computers* **C-35** (1986), 281-283.

• **Conference Articles**

S. M. Doudpota, S. Guha, “Automatic Analysis of Movies for Content Characterization,” to appear *2010 International Conference on Database and Data Mining (ICCDM 2010)*, Manila, Philippines, 2010.

S. Guha, “Efficiently Mining Frequent Subpaths,” *Proc. Eighth Australasian Data Mining Conference (AusDM 2009)*, Melbourne, 2009, 11-15.

C. Chuon, S. Guha, “Volume Cost Based Mesh Simplification,” *Proc. 6th International Conference on Computer Graphics, Imaging and Visualization (CGIV 09)*, Tianjin, China, 2009, 164-169.

C. Chuon, S. Guha, “Surface Mesh Segmentation using Local Geometry,” *Proc. 6th International Conference on Computer Graphics, Imaging and Visualization (CGIV 09)*, Tianjin, China, 2009, 250-254.

S. Guha, “Text Entry Method for Reduced Keypads using One Key Stroke and One Column Stroke per Character,” *13th International Conference on Human-Computer Interaction (HCI International 2009)*, HCI International 2009 – Posters, Springer, San Diego, 2009, 76-80.

K. Khowaja, S. Guha, “Visual Agent Programming (VAP): An Interactive System to Program Animated Agents,” *Proc. 12th International Conference on Human-Computer Interaction (HCI International 2007)*, Beijing, Lecture Notes in Computer Science No. 4557, Springer-Verlag, 2007, 650-658.

*Published software*: “VAP: software to program animated agents,”  
<http://www.cs.ait.ac.th/~b101650/>.

S. Guha, P. Janecek, N. D. C. Song, “SimpliPoly: Curvature-based Polygonal Curve Simplification,” *Proc. 2nd International Conference on Computer Graphics Theory and Applications (GRAPP 2007)*, Barcelona, 2007, 166-171.

*Published software*: “SimpliPoly: polygonal curve simplification software,”  
<http://www.cs.ait.ac.th/~guha/SimpliPoly/simpliPoly.html>.

S. Guha, K. T. Khánh, “Preprocessing Convex Polygons using Range Trees for Recognition with Few Finger Probes,” *Proc. 11th International Conference on Computer Analysis of Images and Patterns (CAIP 2005)*, Lecture Notes in Computer Science No. 3691, Springer-Verlag, 2005, 338-346.

*Published software*: “PolyRecognition: polygon recognition software,”  
<http://www.cs.ait.ac.th/~guha/papers/PolyRecognition.zip>.

C. Chuon, S. Guha, A. K. M. Mahtab Hossain, "Individual Profile Graphs for Location Management in PCS Networks," *Proc. IEEE International Conference on Wireless Networks, Communications and Mobile Computing (3rd MobiWac 2005)*, vol. 1, 187-192.

C. Chuon, S. Guha, "DIP-MIP: Distributed Individual Paging Extension for Mobile IP in IP-Based Cellular Networks," *Proc. IEEE International Conference on Wireless Networks, Communications and Mobile Computing*, 2005, vol. 2, 1005-1010.

S. Guha, "Joint Separation of Geometric Clusters and the Extreme Irregularities of Regular Polyhedra," *Proc. 23rd Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS 2003)*, Lecture Notes in Computer Science No. 2914, Springer-Verlag, 2003, 229-243.

S. Guha, P. Josiah, A. Mittal, S. D. Tran, "Non-Delaunay-based Curve Reconstruction," *Proc. 13th Annual International Symposium on Algorithms and Computation (ISAAC 2002)*, Lecture Notes in Computer Science No. 2518, Springer-Verlag, 2002, 79-90.

A. Dumitrescu, S. Guha, "Extreme Distance in Multicolored Point Sets," *2nd International Workshop on Computational Geometry and Applications (CGA'02)* in *Proc. International Conference on Computational Science 2002*, Lecture Notes in Computer Science No. 2331, Springer-Verlag, 2002, 14-25.

S. Guha, B. P. Le, I. Suzuki, "Design and Implementation of an Interactive Java-Based Tutor," *Proc. 2002 International Conference on Simulation and Multimedia in Engineering Education* (The Society for Modeling and Simulation: Simulation Series, vol. 34 no. 1), 2002, 9-12.  
*Published software*: "JPot – Java Personal OpenGL Tutor," <http://www.cs.uwm.edu/~grafix2/>.

S. Guha, M. Kumar, I. Suzuki, "P.O.T.: An Interactive OpenGL Tutor," *Proc. 2001 International Conference on Simulation and Multimedia in Engineering Education & Virtual Worlds and Simulation* (The Society for Modeling and Simulation: Simulation Series, vol. 33 no. 2), 2001, 111-114.

S. Guha, D. Suri, and I. Suzuki, "Topology-Guided Motion Planning," *Proc. 36th Annual Allerton Conference on Communication, Control, and Computing*, 1998, 620-629.

S. Guha, D. Suri, and I. Suzuki, "Planning Robot Arm Motion: Applications of Topology," invited submission *Proc. International Conference on Computers and Devices for Communication (CODEC)*, Calcutta, 1998, 539-544.

S. Guha, D. Suri, and I. Suzuki, "Random Probing to Approximate Medial Axes and Plan Safe Motion," *Proc. 8th International Conference on Advanced Robotics*, 1997, 353-358.

S. Guha, R. D. Puvvada, D. Suri, and I. Suzuki, "New Approaches in Randomized Preprocessing for Motion Planning," *Proc. 1997 IEEE International Symposium on Circuits and Systems*, 1997, 1780-1783.

- S. Guha, D. Suri, and I. Suzuki, "Planning Safe Motion for 2- and 3-DOF Manipulators by Computing an Approximate Medial Axis of the Free Configuration Space," *Proc. 5th IEEE International Conference on Emerging Technologies and Factory Automation*, 1996, 467-474.
- T. K. Dey and S. Guha, "Algorithms for Manifolds and Simplicial Complexes in Euclidean 3-Space," *Proc. 28th Annual ACM Symposium on the Theory of Computing (STOC)*, 1996, 398-407.
- T. K. Dey and S. Guha, "Optimal Algorithms for Curves on Surfaces," *Proc. 36th Annual IEEE Symposium on Foundations of Computer Science (FOCS)*, 1995, 266-273.
- N. Folwell, S. Guha, and I. Suzuki, "A Practical Algorithm for Integer Sorting on a Mesh-Connected Computer," *Proc. High Performance Computing Symposium'95*, 1995, 281-291.
- S. Guha, "An Optimal Mesh Computer Algorithm for Constrained Delaunay Triangulation," *Proc. 8th IEEE International Parallel Processing Symposium*, 1994, 102-109.
- S. Guha and I. Suzuki, "Proximity Problems and the Voronoi Diagram on a Rectilinear Plane with Rectangular Obstacles," *Proc. 13th Conference on the Foundations of Software Technology and Theoretical Computer Science*, Lecture Notes in Computer Science No. 761, Springer-Verlag, 1993, 218-227.
- S. Guha, "Parallel Analog Algorithms for Processing Polygonal Images on a Systolic Screen," *Proc. 7th IEEE International Parallel Processing Symposium*, 1993, 557-562.
- S. Guha, "Optimal Mesh Computer Algorithms for Simple Polygons," *Proc. 7th IEEE International Parallel Processing Symposium*, 1993, 182-187.
- D. Z. Chen and S. Guha, "Testing a Simple Polygon for Monotonicity Optimally in Parallel," *Proc. 7th IEEE International Parallel Processing Symposium*, 1993, 326-330.
- A. Sen, H. Deng, and S. Guha, "On a Graph Partitioning Problem with Applications to VLSI Layout," *Proc. 1991 IEEE International Symposium on Circuits and Systems*, 1991, 2846-2849.
- S. Guha, "An Optimal Parallel Algorithm for the Rectilinear Voronoi Diagram," *Proc. 28th Annual Allerton Conference on Communication, Control, and Computing*, 1990, 798-807.
- M. T. Goodrich, S. B. Shauck, and S. Guha, "Parallel Methods for Visibility and Shortest Path Problems in Simple Polygons," *Proc. 6th Annual ACM Symposium on Computational Geometry*, 1990, 73-82.
- A. Sen and S. Guha, "Fault Diagnosis in Multiprocessor Architecture Models with Multivalued Test Outcomes," *Proc. 14th International Symposium on Multiple Valued Logic*, 1984, 210-214.
- S. Guha and A. Sen, "A Universal Diagnosis Algorithm using Boolean Logic," presented at the *14th IEEE International Conference on Fault-Tolerant Computing*, 1984.

S. Guha and A. Sen, "Interpolation Merge – Case for a New Merging Algorithm," *Proc. Computer Society of India*, 1983, A2.10.01-A2.10.10.

## DOCTORAL STUDENTS

Chansophea Chuon, current at AIT.  
*Area:* Computer Graphics.

Kifayat Ullah, current at AIT.  
*Area:* Data Mining.

Sher Muhammad Doudpota, current at AIT.  
*Area:* Data Mining.

Jongkol Janruang, current at AIT.  
*Area:* Data Mining.

Thanakorn Sakchaichoroenkul, Ph.D., AIT, December 2006.  
*Thesis:* "MCFI-Based Animation Tweening Algorithm".  
*Currently:* Assistant Professor, Department of Computer Science, Thammasat University, Thailand.

Deepti Suri (jointly with Prof. I. Suzuki), Ph.D., University of Wisconsin-Milwaukee, May 1999.  
*Thesis:* "Planning Safe and Efficient Movement of a Manipulator in an Environment with Static Obstacles".  
*Currently:* Associate Professor, Electrical Engineering and Computer Science, Milwaukee School of Engineering.

## COURSES TAUGHT

### • At AIT

Advanced Topics in Computer Graphics and Related Areas  
Computational Geometry and Applications  
Computer Graphics and Animation  
Computer Organization and Architecture  
Data Structures and Algorithms  
Data Mining  
Knowledge Organization and Information Access

### • At the University of Wisconsin-Milwaukee

Computational Geometry  
Data Structures and Algorithms  
Discrete Information Structures  
Fundamentals of Computer Graphics  
Introduction to Database Systems

Introduction to the Theory of Computation  
Parallel Algorithms

## GRANTS

### • Intramural at AIT

Proposal titled “Curve and Surface Reconstruction” submitted for the AIT Research Initiation Grant, February 2003. Funded for 2003-4, amount THB 50,000.

### • Extramural at the University of Wisconsin-Milwaukee

Regular Proposal titled “Computational Topology: Algorithms and Applications” submitted to NSF, 1997. Funded for 1997-1999, amount \$107,595 from NSF and \$8,000 matched for equipment by UWM, total \$115,595.

Gift to the UWM Foundation for Research in Computational Geometry and Databases, from the Government Housing Bank, Thailand, 1996, amount \$3,500.

### • Intramural at the University of Wisconsin-Milwaukee

Proposal (jointly with Prof. I. Suzuki) titled “Advanced Computer Graphics Laboratory” submitted to the University Laboratory Modernization Program, November 1996. Funded in 1997, amount \$67,500.

Proposal titled “Computational Topology” submitted to the Graduate School Research Committee Awards, September 1995. Funded for 1996-97, amount \$8,099.

Proposal titled “Parallel Processing in Computer Algebra” submitted to the Graduate School Research Incentive Program, October 1994. Funded for 1995-96, one course buy-out.

Proposal titled “On-Line Algorithms for Geometric Problems” submitted to the Graduate School Research Incentive Program, February 1992. Funded for 1992-93, one course buy-out.

Proposal titled “Parallel and On-Line Algorithms for Geometric Problems” submitted to the Graduate School Research Committee Awards, September 1991. Funded for 1992-93, amount \$7,222.

## RESEARCH COMMUNITY ACTIVITIES

Reviewed submissions to various journals and conferences including:

*International Conference on Intelligent Agent and Multi-Agent Systems (IAMA 2009)*

*3rd International Conference on Computer Vision Theory and Applications (VISAPP 2008)*

*Asian Computing Science Conference 2006 (Asian'06)*

*Journal of the ACM*

*Algorithmica*

*Computers and Mathematics with Applications*  
*IEEE International Parallel Processing Symposium*  
*Information Processing Letters*  
*International Journal of Computational Geometry and Applications*  
*Journal of Algorithms*  
*Journal of Parallel and Distributed Computing*  
*Theoretical Computer Science*

Member of the Program Committee of the International Conference on Intelligent Agent and Multi-Agent Systems (IAMA 2009), July 22-24, 2009, Chennai, India.

Member of the Program Committee of the 3rd International Conference on Computer Vision Theory and Applications (VISAPP 2008), January 22-25, 2008, Funchal, Portugal.

Member of the Program Committee of the 11th Annual Asian Computing Science Conference 2006 (Asian'06), December 6-8, 2006, Tokyo, Japan.

Invited to serve on review panels for regular proposals to the Numeric, Symbolic, and Geometric Computation Program within the Division of Computer and Computation Research of the National Science Foundation, USA.

#### **INVITED LECTURES**

On "Computing Homology Groups of Simplicial Complexes in  $R^3$ " at the Department of Computer Science, Asian Institute of Technology, Bangkok, June 2000.

On "Computing Homology Groups of Simplicial Complexes" as part of the Minisymposium on Computational Geometry and Topology at the *Fifth SIAM Conference on Geometric Design (GD97)*, Nashville, November 1997.

On "Optimal Algorithms for Curves on Surfaces" at the Department of Mathematics, Jadavpur University, Calcutta, January 1996.

On "Proximity Problems and the Voronoi Diagram on a Rectilinear Plane with Rectangular Obstacles" at the Department of Computer Science and Engineering, University of South Florida, Tampa, March 1994.

#### **PROFESSIONAL ASSOCIATIONS**

Member of the Association for Computing Machinery.