Curriculum Vitae of Tamal K. Dey

1. Name in full. TAMAL KRISHNA DEY

2. Office Address.

Lawson 3183
Department of Computer Science
Purdue University
305 N. University St.
West Lafayette, Indiana 47907
Phone: 614-843-6691
E-mail: tamaldey@purdue.edu

3. Wikipedia Page. https://en.wikipedia.org/wiki/Tamal_Dey

4. Web-page. https://www.cs.purdue.edu/homes/tamaldey/

5. Academics.

Year	Degree	School/College / University	Div. / class	Area
1992	Post-Doctorate	U. Illinois Urbana-Champaign		Comp. Sc.
1991	Ph.D.	Purdue University		Comp. Sc.
1987	M.Tech.	I.I.Sc., Bangalore (Dept. of Computer Sc.)	Ist class/ honors	Comp. Sc.
1985	B.E.	Jadavpur University (Dept. of Electronics.)	Ist class/honors	Electronics

6. Employment.

1. Professor (2020–), Computer Science, Purdue U.

2. Interim Chair (2019-2020), Computer Science & Engineering, Ohio Satte U.

3. Professor (2004-2020), Associate Professor (1999–2004), Department of CSE, Ohio State U.

4. Professor (2015-2020), (courtesy appointment), Department of Mathematics, Ohio State U.

5. Associate Professor (1998-1999), Assistant Professor (1994-1998). Department of Computer Science & Engineering, I.I.T. Kharagpur, India.

6. Adjunct Assistant Professor (1994-1997), Assistant Professor (1992-1994). Department of Computer Science, Indiana Univ. - Purdue Univ., Indianapolis.

7. Post-Doctoral fellow (1991-1992). Department of Computer Science, Univ. of Illinois at Urbana-Champaign Urbana, Illinois, USA.

7. Academic Honor. ACM Fellow, IEEE Fellow, SMA Fellow, Lumley research awardee, OSU, Fellow, Asia-Pacific Artificial Intelligence Association.

8. Research Interest.

Computational geometry, computational topology, topological data analysis, geometric modeling, computer graphics, mesh generation.

9. Publications.

BOOKS.

1. T. K. Dey and Y. Wang. Computational Topology for Data Analysis. Cambridge University Press, New York, 2022.

2. S.-W. Cheng, T. K. Dey, J. R. Shewchuk. Delaunay Mesh Generation. CRC Press. December, 2012.

3. T. K. Dey. Curve and Surface Reconstruction : Algorithms with Mathematical Analysis. Cambridge University Press, New York, 2007.

PAPERS.

A. Topological Data Analysis.

1 T. K. Dey, T. Hou, D. Morozov. A Fast Algorithm for Computing Zigzag Representatives. *Proc. ACM-SIAM conf. Discrete Algorithms (SODA 2025)*, to appear.

2 T. K. Dey, T. Hou. Computing zigzag vineyard efficiently including expansions and contractions. *Proc. 40th Internat. Sympos. Comput. Geom. (SoCG 2024)*, 2024.

3 T. K. Dey, F. Russold, S. Samaga. Efficient algorithms for computing complexes of persistence modules with applications. *Proc. 40th Internat. Sympos. Comput. Geom. (SoCG 2024)*, 2024.

4 T. K. Dey, A. Rathod. Cup product persistence and its efficient computations. *Proc. 40th Internat. Sympos. Comput. Geom. (SoCG 2024)*, 2024.

5 T. K. Dey, M. Lipinski, M. Mrozek, R. Slechta. Computing connection matrices via persistence-like reductions. SIAM J. Applied Dynamical Systems, Vol. 23, Issue 1, pages 81-97, 2024.

6 M. Liu, T. K. Dey, and D. F. Gleich. Topological structure of complex predictions. Nature Machine Intelligence, 5:1382–1389, 2023.

7 T. K. Dey, T. Hou, S. Parsa. Revisiting graph persistence for updates and efficiency. *Proc. 18th Algorithms and Data Structures Symposium (WADS 2023)*, LNCS 14079, pages 371-385.

8 N. Clause, T. K. Dey, F. Memoli, B. Wang. Meta-diagrams for 2-parameter persistence. *Proc. 39th Internat. Sympos. Comput. Geom. (SoCG 2023)*,Vol. 258 of LIPIcs, pages 25:1–25:16.

9 C. Xin, S. Mukherjee, S.N. Samaga, T. K. Dey. GRIL: A 2-parameter persistence based vectorization for machine learning. Proc. of TAGML (ICML) 2023.

10 T. K. Dey, T. Hou. Fast computation of zigzag persistence. *Proc. 30th European Symposium on Algorithms (ESA 2022)*, Vol. 244 of LIPIcs, pages 43:1–43:15.

11 T. K. Dey, W. Kim, and F. Memoli. Computing generalized rank invariant for 2-parameter persistence modules via zigzag persistence and its applications. *Proc. 38th Internat. Sympos. Comput. Geom. (SoCG 2022)*, Vol. 224 of LIPIcs, pages 34:1–34:17. Journal version in Discrete. Comput. Geom. (2024), vol. 71, 67–94.

12 T. K. Dey, M. Lipinski, M. Mrozek, and R. Slechta. Tracking dynamical features via continuation and persistence. *Proc. 38th Internat. Sympos. Comput. Geom. (SoCG 2022)*, Vol. 224 LIPIcs, pages 35:1–35:17.

13 T. K. Dey, M. Mrozek, and R. Slechta. Persistence of Conley-Morse Graphs in Combinatorial Dynamical Systems. *SIAM J. Applied Dynamical Systems*, Vol. 21(2022).

14 T. K. Dey and S. Zhang. Approximating 1-Wasserstein Distance between Persistence Diagrams by Graph Sparsification. *SIAM Sympos. Algorithm Engineering and Experiments (ALENEX 22)*, 2022.

15 A. V. Patel, T. Hou, J. D. B. Rodriguez, T. K. Dey, and D. P. Birnie III. Topological filtering for 3D microstructure segmentation. *Computational Materials Science*, Vol. 202:110920 (2022).

16 T. K. Dey and T. Hou. Computing zigzag persistence on graphs in near-linear time. *37th Internat. Sympos. Comput. Geom. (SoCG21)*, 30:1–30:15 (2021).

17 T. K. Dey, T. Hou, and S. Mandal. Computing optimal persistent cycles: polynomial and hard cases. *ACM-SIAM Sympos. Discrete Algorithms (SODA20)*, (2020).

18 T. K. Dey, M. Mrozek, and R. Slechta. Persistence of the Conley index in combinatorial dynamical systems. *36th Internat. Sympos. Comput. Geom.(SoCG20)*, 37:1–37:17 (2020).

19 T. K. Dey, T. Li, and Y. Wang. An efficient algorithm for 1-Dimensional (persistent) path homology. *36th Internat. Sympos. Comput. Geom.(SoCG20)*, 36:1–36:15 (2020).

20 T. K. Dey , T. Hou, and S. Mandal. Petsistent 1-Cycles: Definition, Computation, and Its Application. *Proc. Computational Topology in Image Context (CTIC 2019)*, LNCS, Vol. 11382, 123–136 (2019).

21 T. K. Dey. Computing height persistence and homology generators in R^3 efficiently. *ACM-SIAM Sympos. Discrete Algorithms (SODA19)*, (2019).

22 T. K. Dey , R. Slechta. Filtration simplification for persistent homology via edge contraction. *Internat. Conf. Discrete Geoem. for Comput. Imagery (DGCI 2019)*, 89–100 (2019).

23 T. K. Dey, M. Juda, T. Kapela, J. Kubica, M. Lipinski, M. Mrozek. Persistent homology of Morse decompositions in combinatorial dynamics. SIAM J. on Applied Dynamical System, Vol. 18, Issue 1, 510–530, (2019).

24 T. K. Dey and Cheng Xin. Computing bottleneck distance for 2-D interval decomposable modules. *34th Internat. Sympos. Comput. Geom.(SoCG18)*, 32:1–32:15 (2018).

25 T. K. Dey, J. Wang, and Y. Wang. Graph reconstruction by discrete Morse theory. *34th Internat. Sympos. Comput. Geom.(SoCG18)* 31:1–31:15 (2018).

26 T. K. Dey, T. Li, and Y. Wang. Efficient algorithms for computing a minimal homology basis. *LATIN* (2018).

27 T. K. Dey and R. Slechta. Edge contraction in persistence-generated dicsrete Morse vector fields. *Computer & Graphics*, Vol. 74, 33-43 (2018).

28 T. K. Dey, F. Memoli, and Y. Wang. Topological analysis of nerves, Reeb spaces, mappers, and multiscale mappers. *Internat. Sympos. Comput. Geom.(SoCG17)* (2017).

29 T. K. Dey, Z. Dong, and Y. Wang. Parameter-free topology inference and sparsification for data on manifolds. Accepted in *ACM-SIAM Sympos. Discrete Algorithms (SODA17)*.

30 T. K. Dey, F. Memoli, and Y. Wang. Multiscale Mapper: Topological summarization via codomains covers. *ACM-SIAM Sympos. Discrete Algorithms* (SODA16).

31 T. K. Dey, D. Shi, and Y. Wang. Comparing graphs via persistence distortion. *Proc. 31st Annu. Sympos. Comput. Geom.(SoCG15)* (2015).

32 M. Büchet, F.Chazal, T. K. Dey, F. Fan, S. Oudot, and Y. Wang. Topological analysis of scalar fields with outliers. *Proc. 31st Annu. Sympos. Comput. Geom. (SoCG15)* (2015).

B. Computational Topology.

1 T. K. Dey, F. Fan, and Y. Wang Computing topological persistence for simplicial maps. *Proc. 30th Annu. Sympos. Comput. Geom.(SoCG14)* (2014).

2 T. K. Dey, F. Fan, and Y. Wang. Graph induced complex on point data. *Proc. 29th Annu. Sympos. Comput. Geom.(SoCG14)* (2013), pages 107–116. **Invited** in *Comput. Geom. Theory & Appl.* **48**, 8 (2015), 575-588.

3 D. Burghelea and T. K. Dey. Topological Persistence for circle valued maps. *Discrete & Computational Geometry* **50**, 1 (2013), pp 69-98.

4 T. K. Dey, P. Ranjan, and Y. Wang. Weighted graph Laplace operator under topological noise. *ACM-SIAM Symposium on Discrete Algorithms (SODA13)* (2013).

5 O. Busaryev, S. Cabello, C. Chen, T. K. Dey, and Y. Wang. Annotating simplices with a homology basis and its applications *13th Scandinavian Sympos. Workshops Algorithm Theory (SWAT 2012)*. Lecture Notes in Computer Science Volume 7357, 2012, pp 189-200.

6 T. K. Dey and Y. Wang. Reeb graphs: approximation and persistence. *Proc. 27th Annu. Sympos. Comput. Geom. (SOCG11)* (2011), 226–235. **Invited** and appeared in *Discrete & Computational Geometry* **49**, 13 (2013), 46–73.

7 T. K. Dey, A. Hirani, and B. Krishnamoorthy. Optimal homologous cycles, total unimodularity, and linear programming. *42nd ACM Sympos. Theory Comput. (STOC10)*, (2010), 221–230. Journal version in *SIAM J. Computing*, Vol. 40, pp 1026–1044, 2011.

8 T. K. Dey, J. Sun, and Y. Wang. Approximating loops in a shortest homology basis from point data. *26th. Ann. Sympos. Comput. Geom. (SoCG10)* (2010), 166–175. Journal version in *Inverse Problems*, Vol. 27 (2011), 124004.

9 O. Busaryev, T. K. Dey, and Y. Wang. Tracking a generator by persistence. *16th Ann. Internat. Computation and Combinatorics Conf. (COCOON)* (2010), 278–287.

10 T. K. Dey and K. Li. Cut locus and topology from surface point data. *25th Ann. Sympos. Comput. Geom. (SoCG09)* (2009), 281–290.

11 K. Buchin, T. K. Dey, M. John, and J. Giesen. Recursive geometry of the flow complex and the topology of the flow complex filtration. *Comput. Geom. Theory Applications* vol. 40 (2008), 115–157.

12 T. K. Dey and R. Wenger. Stability of critical points with interval persistence. *Discrete Comput. Geom.* vol. 38 (2007), 479–512.

13 T. K. Dey, J. Giesen, E. A. Ramos and B. Sadri. Critical points of the distances to an epsilon-sampling on a surface and flow complex reconstruction. *21st Annu. Sympos. Comput. Geom. (SoCG05)* (2005), 218–227. **Invited** *Internat. J. Comput. Geom. Applications* vol. 18 (2007), 29–61.

14 T. K. Dey, J. Giesen and M. John. Alpha shapes and flow shapes are homotopy equivalent. *Proc. ACM Sympos. Theory Computing (STOC03)* (2003), 493–502.

15 H.-L. Cheng, T. K. Dey, H. Edelsbrunner and J. Sullivan. Dynamic skin triangulation. **Invited** in *Discrete Comput. Geom.* Vol. 25 (2001), 525–568. Prelim. version in *SODA01*.

16 T. K. Dey and S. Guha. Transforming curves on surfaces. *Journal of Computer and System Sciences*, Vol. 58 (1999), 297–325. Prelim. version in *IEEE FOCS'95*, 266-274.

17 T. K. Dey, H. Edelsbrunner, S. Guha and D. V. Nekhayev. Topology preserving edge contractions. *Publ. Inst. Math. (Beograd) (N. S.)*, Vol. 66 (1999), 23–45.

18 T. K. Dey and S. Guha. Computing homology groups of simplicial complexes in R^3. *J. ACM*, Vol. 45, No. 2 (1998), 266-287. Prelim. version in *28th ACM Sympos. Theory Computing (STOC96)* (1996), 398-407.

19 T. K. Dey, H. Edelsbrunner and S. Guha. Computational Topology. **Invited** in *Advances in Discrete and Computational Geometry*, eds. B. Chazelle, J. E. Goodman and R. Pollack. Contemporary Mathematics 223, AMS, Providence, 1999, 109–143.

20 T. K. Dey. Optimal algorithms to detect null-homologous cycles on 2-manifolds. *Internat. J. Comput. Geom. Applications*, Vol. 7, No. 3 (1997), 167–174.

21 T. K. Dey and H. Schipper. A new technique to compute polygonal schema for 2-manifolds with application to null-homotopy detection. *Discrete Comput. Geom.*, Vol. 14 (1995), 93–110.

C. Graphics/Modeling.

1. M. Hajij, T. K. Dey, and X. Li. Segmenting a surface mesh into pants using Morse theory. *Graphical Models*, Vol. 88 (2016), pages 12–21.

2. T. K. Dey, B. Fu, H. Wang, and L. Wang. Automatic posing of meshed human model using point clouds (SMI 2014), *Computers & Graphics*, Vol. 46 (2014), pages 14–24.

3. T. K. Dey, F. Fan, and Y. Wang. An efficient computation of handle and tunnel loops via Reeb graphs. *Siggraph 2013*, 2013.

4. O. Busaryev, T. K. Dey, and H. Wang. Adaptive fracture simulation of multi-layered thin plates. *ACM Transactions on Graphics (SIGGRAPH)* (2013), vol. 32, no. 4.

5. T. K. Dey and L. Wang. Voronoi-based Feature Curves Extraction for Sampled Singular Surfaces. *SMI 2013*, Computers & Graphics, special issue of Shape Modeling International (2013).

6. O. Busaryev, T. K. Dey, H. Wang, and R. Zhong. Animating bubble interactions in a liquid foam *SIGGRAPH 2012*, *ACM Trans. Graphics*, Vol. 31, 4, (2012).

7. T. K. Dey, X. Ge, Q. Que, I. Safa, L. Wang, Y. Wang Feature-Preserving reconstruction of singular surfaces *Proc. Sympos. Geometry Processing (SGP)*, 2012. *Computer Graphics Forum*, Vol. 31, 5, pages 1787–1796, (2012).

8. T. K. Dey, K. Li, C. Luo, P. Ranjan, I. Safa, and Y. Wang. Persistent heat signature for pose-oblivious matching of incomplete models. *Proc. Sympos. Geometry Processing. (SGP)* (2010). *Computer Graphics Forum*, Vol. 29 (5) (2010), 1545–1554.

9. T. K. Dey, P. Ranjan, and Y. Wang. Convergence, Stability, and Discrete Approximation of Laplace Spectra. *Proc. ACM/SIAM Sympos. Discrete Algorithms (SODA)* (2010), 650–663.

10. T. K. Dey, K. Li, E. Ramos, and R. Wenger. Isotopic reconstruction of surfaces with boundaries. *Proc. Sympos. Geom. Processing (SGP)* (2009), 1371–1382.

11. T. K. Dey and K. Li. Persistence-based handle and tunnel loop computations revisited for speed up. *Computers & Graphics* (2009), vol. 33, 351–358.

12. T. K. Dey, K. Li, J. Sun, and D. Cohen-Steiner. Computing geometry-aware handle and tunnel loops in 3D models. *SIGGRAPH 2008*, 45:1–45:9.

13. T. K. Dey and J. Levine. A Delaunay simplification algorithm for vector fields. *IEEE Proc. 15th Pacific Conf. Comput. Graphics and Applications* (2007), 281–290.

14. T. K. Dey, K. Li, and J. Sun. On computing handle and tunnel loops for surfaces. *IEEE Proc. Internat. Conf. on Cyberworlds (NASAGEM 07)* (2007), 357–366.

15. S. Goswami, T. K. Dey, C. Bajaj. Identifying flat and tubular regions of a shape by unstable manifolds. *Proc. 11th ACM Sympos. Solid Modeling Applications* (2006), 27–37.

16. T. K. Dey, J. Sun. Defining and computing curve-skeletons with medial geodesic function. *Proc. Sympos. Geometry Processing (SGP)* (2006), 143–152.

17. T. K. Dey and J. Sun. Normal and feature approximations from noisy point clouds. *Proc. FST&TCS 2006*, LNCS 4337, 21–32.

18. T. K. Dey, J. Sun. An adaptive MLS surface for reconstruction with guarantees. *Proc. Eurographics Sympos. Geom. Processing (SGP)* (2005), 43–52.

19. T. K. Dey, G. Li and J. Sun. Normal estimation for point clouds : a comparison study for a Voronoi based method *Proc. Eurographics Sympos. on Point-Based Graphics* (2005), 39–46.

20. T. K. Dey, J. Giesen and S. Goswami. Delaunay triangulations approximate anchor hulls. *Comput. Geom. Theory Applications*, Vol. 36 (2006), 131–143.

21. S.-W. Cheng, T. K. Dey and E. A. Ramos. Manifold reconstruction from point samples. *Proc. 16th Annu. ACM-SIAM Sympos. Comput. Geom. (SODA)* (2005), 1018–1027.

22. T. K. Dey. Sample based geometric modeling. *Special issue of DIMACS series on Computer Aided Design and Manufacturing* (2005).

23. T. K. Dey, J. Giesen and S. Goswami. Shape segmentation and matching from noisy point clouds. *Point-based Graphics* (2004).

24. T. K. Dey and S. Goswami. Provable surface reconstruction from noisy samples. *Comput. Geom. Theory Appl.* Vol. 35 (2006), 124–141. Prelim. version *SoCG 2004*.

25. T. K. Dey, J. Giesen and S. Goswami. Shape segmentation and matching with flow discretization. *Proc. Workshop Algorithms Data Structures* (2003), LNCS 2748, 25–36.

26. T. K. Dey and S. Goswami. Tight Cocone: A watertight surface reconstructor. **Invited** in *J. Computing Infor. Sci. Engin.* Vol. 3 (2003), 302–307.

27. T. K. Dey and J. Hudson. PMR: point to mesh rendering, a feature based approach. *Proc. IEEE Visualization* (2002), 155-162.

28. T. K. Dey, J. Giesen, S. Goswami and W. Zhao. Shape dimension and approximation from samples. *Discrete Comput. Geom.*, Vol. 29 (2003), 419–434. Prelim. version *SODA 2002*.

29. T. K. Dey and W. Zhao. Approximating the medial axis for CAD models. *Proc. 8th ACM Sympos. Solid Modeling Applications* (2003), 280–285.

30. T. K. Dey, J. Giesen and J. Hudson. Delaunay based shape reconstruction from large data. *Proc. IEEE Sympos. Parallel and Large Data Visualization and Graphics* (2001), 19–27.

31. T. K. Dey and J. Giesen. Detecting undersampling in surface reconstruction. **Invited** in *Ricky Pollack and Eli Goodman Festschrift*, eds. B. Aronov, S. Basu, J. Pach and M. Sharir, Springer-Verlag, (2003), 329–345. Also in *Proc. 17th Annu. Sympos. Comput. Geom.* (2001), 257–263.

32. T. K. Dey, J. Giesen, N. Leekha and R. Wenger. Detecting boundaries for surface reconstruction using co-cones. **Invited** in *Internat. J. Comput. Graphics CAD/CAM*, Vol. 16 (2001), 141–159.

33. T. K. Dey, J. Giesen, S. Goswami, J. Hudson, R. Wenger and W. Zhao. Undersampling and oversampling in sample based shape modeling. *Proc. IEEE Visualization* (2001), 83–90.

34. T. K. Dey, S. Funke and E. Ramos. Surface reconstruction in almost linear time under locally uniform sampling. *Proc. 17th European Workshop Comput. Geom.* (2001).

35. T. K. Dey, J. Giesen and W. Zhao. Robustness issues in surface reconstruction. *Proc. Internat. Conf. Comput. Sci.* (2001).

36. N. Amenta, S. Choi, T. K. Dey and N. Leekha. A simple algorithm for homeomorphic surface reconstruction. **Invited** in *Internat. J. Comput. Geom. Applications*, Vol. 12 (2002), 125–141. Prelim. version *SoCG 2000*.

37. T. K. Dey and R. Wenger. Reconstructing curves with sharp corners. *Comput. Geom. Theory Applications*, Vol. 19 (2001), 89-99. Prelim. version *SoCG 2000*.

38. T. K. Dey and R. Wenger. Fast reconstruction of curves with sharp corners. *Internat. J. Comput. Geom. Applications*, Vol. 12 (2002), 353–400.

39. T. K. Dey and P. Kumar. A simple provable algorithm for curve reconstruction. *Proc. 10th ACM-SIAM Sympos. Discrete Algorithms (SODA'99)* (1999), 893-894.

40. T. K. Dey, K. Mehlhorn and E. Ramos. Curve reconstruction: connecting dots with good reason. *Comput. Geom. Theory Applications*, Vol. 15 (2000), 229–244. Prelim. version *SoCG 1999*, 197–206.

41. S. W. Cheng and T. K. Dey. Improved construction of Delaunay based contour surfaces. *Proc. ACM Sympos. Solid Modeling Applications* (1999), 322–323.

D. Triangulations / Mesh Generation.

1 T. K. Dey and A. Slatton. Localized Delaunay refinement for piecewise-smooth complexes. *Proc. 29th Annu. Sympos. Comput. Geom.* (2013), pages 47–56.

2 T. K. Dey and A. G. Slatton. Localized Delaunay refinement for volumes. Computer Graphics Forum, Vol 30 (5), 1417–1426. Special issue *Proc. of Eurographics Sympos. Geometry Processing (SGP 2011)*.

3 T. K. Dey, J. A. Levine, and A. Slatton. Localized Delaunay refinement for sampling and meshing. Computer Graphics Forum. Vol. 29 (5), 1723–1732. Special issue of Proc. Eurographics Sympos. Geometry Processing. (SGP 2010).

4 O. Busaryev, T. K. Dey and J. Levine. Repairing and meshing imperfect shapes with Delaunay refinement. *ACM Sympos. Solid and Physical Modeling* (2009), 25–33.

5 T. K. Dey. Delaunay mesh generation of three dimensional domains. Invited article as a book chapter in Tessellations in the Sciences: Virtues, Techniques and Applications of Geometric Tilings, Eds. R. van de Weygaert, G. Vegter, J. Ritzerveld & V. Icke, Springer-Verlag, 2009.

6 S.-W. Cheng and T. K. Dey. Maintaining deforming meshes. *Proc. ACM-SIAM Sympos. Discrete Algorithms (SODA)* (2008), 112–121.

7 T. K. Dey and J. Levine. A practical Delaunay meshing algorithm for a large class of domains. *Proc. 16th Internat. Meshing Roundtable* (2007), 477–494.

8 T. K. Dey and J. Levine. Delaunay meshing of isosurfaces. *IEEE Proc. Shape Modeling and Applications* (2007), 241–250.

9 S.-W. Cheng, T. K. Dey, E. A. Ramos. Delaunay refinement for piecewise smooth complexes. *Proc. 18th Annu. ACM-SIAM Sympos. Discrete Algorithms (SODA)* (2007), 1096–1105.

10 S.-W. Cheng, T. K. Dey, E. A. Ramos and T. Ray. Sampling and meshing a surface with guaranteed topology and geometry. *SIAM J. Computing* vol. 37 (2007), 1199-1227. Prelim. version *SoCG 2004*.

11 S.-W. Cheng, T. K. Dey, E. A. Ramos and R. Wenger. Anisotropic surface meshing. *Sympos. Discrete Algorithms (SODA)*, 2006, 202–211.

12 T. K. Dey, G. Li and T. Ray. Polygonal surface remeshing with Delaunay refinement. *14th Internat. Meshing Roundtable* (2005), 343–361.

13 S.-W. Cheng, T. K. Dey and T. Ray. Weighted Delaunay refinement for polyhedra with small angles. *Proc. 14th Internat. Meshing Roundtable* (2005).

14 S.-W. Cheng, T. K. Dey, E. A. Ramos and T. Ray. Quality meshing for polyhedra with small angles. *Internat. J. Comput. Geom. Appl.* (2005), 421–461. Prelim. version *SoCG 2004*.

15 S.-W. Cheng and T. K. Dey. Quality meshing with weighted Delaunay refinement. *SIAM J. Computing* Vol. 33 (2003), 69–93. Prelim. version *SODA 2002*.

16 S.-W. Cheng, T. K. Dey and S.-H. Poon. Hierarchy of surface models and irreducible triangulations. *Internat. J. Comput. Geom. Applications* Vol. 27 (2003), 135–150.

17 T. K. Dey, J. Giesen and J. Hudson. Sample shuffling for quality hierarchic surface meshing. *Proc. 10th Internat. Meshing Roundtable*, Newport Beach, California, (2001), 143–154.

18 T. K. Dey, J. Giesen and J. Hudson. Decimating samples for mesh simplification. *Proc. 13th Canadian Conf. Comput. Geom.* (2001), 85–88.

19 S. W. Cheng, T. K. Dey, H. Edelsbrunner, S. H. Teng. Sliver exudation. *J. ACM*, Vol. 47 (2000), 883–904. Prelim. version *SoCG 1999*.

20 S. W. Cheng and T. K. Dey. Approximate minimum weight Steiner triangulation in three dimensions. *Proc. 10th ACM-SIAM Sympos. Discrete Algorithms (SODA)* (1999), 205–214.

21 T. K. Dey, A. Roy and N. R. Shah. Approximating geometric objects through topological triangulations. *Proc. 17th FSTTCS Conference*, Lecture Notes in Computer Science 1346, 6-21 (1997).

22 T. K. Dey, M. Dillencourt, S. Ghosh and J. Cahil. Triangulating with high connectivity. *Comput. Geom. Theory Applications*, Vol. 8, No. 1 (1997), 39–56.

23 T. K. Dey, C. Bajaj and K. Sugihara. On good triangulations in three dimensions. *Internat. J. Comput. Geom. Applications*. Vol. 2 (1992), 75-95.

24 T. K. Dey, C. Bajaj and K. Sugihara. Delaunay triangulations in three dimensions with finite precision arithmetic. *Computer Aided Geometric Design*, Vol. 9 (1992), 457-470.

E. Solid Modeling.

1 T. K. Dey and W. Zhao. Approximating the medial axis from the Voronoi diagram with a convergence guarantee. *Algorithmica*, Vol. 38 (2003), 179–200.

2 T. K. Dey and W. Zhao. Approximating the medial axis for CAD models. **Invited** in *Comput. Aided Design* Vol. 36 (2003), 195–202.

3 T. K. Dey and W. Zhao. Approximate medial axis as a Voronoi subcomplex. *7th ACM Sympos. Solid Modeling Applications* (2002), 356–366.

4 C. Bajaj and T. K. Dey. CSG operations on a MIMD distributed memory machines. *Proc. CSG 94*, Winchester, UK, 13-15 April, 1994.

5 C. Bajaj and T. K. Dey. Convex decompositions of polyhedra and robustness. *SIAM Journal Computing*, Vol. 21 (1992), 339-364.

6 T. K. Dey, C. Bajaj and K. Sugihara. On good triangulations in three dimensions. *Proc. ACM Sympos. Solid Modeling Applications* (1991), 431–441.

7 T. K. Dey. Triangulation and CSG representation of polyhedra with arbitrary genus. *Proc. 7th Annu. Sympos. Comput. Geom.* (1991), 364-372.

8 C. Bajaj, V. Anupam, T. K. Dey, S. Klinkner, A. Royappa. CREMONA: A graphical editing system for algebraic boundary models. *SIAM Conference on Geometric Design*. Tempe, Arizona (1989).

F. Combinatorial Geometry.

1 T. K. Dey, A. Rossi, and A. Sidiropoulos. Temporal hierarchical clustering. *Proc. 28th Internat. Sympos. Algorithms and Computations(ISAAC)* (2017).

2 T. K. Dey, A. Rossi, and A. Sidiropoulos. Temporal clustering. *Proc. European Sympos. Algorithms (ESA)* (2017).

3 B. Aronov and T. K. Dey. Polytopes in arrangements. *Discrete Comput. Geom.*, Vol. 25 (2001), 51–63. Prelim. version *SoCG 1999*.

4 T. K. Dey. Improved bounds for planar k-sets and related problems. **Invited** in *Discrete Comput. Geom.*, Vol. 19, No. 3 (1998), 373–382. Prelim. version *37th IEEE FOCS (1997)*, 156–161.

5 T. K. Dey and J. Pach. Extremal problems for geometric hypergraphs. *Discrete Comput. Geom.*, Vol. 19, No. 4 (1998), 473–484. Prelim. version *ISAAC96*, LNCS 1178, 105–114.

6 T. K. Dey and N. Shah. On counting the number of simplicial complexes in R^d. *Comput. Geom. Theory Applications* Vol. 8, No. 5 (1997).

7 T. K. Dey and H. Edelsbrunner. Counting triangle crossings and halving planes. **Invited** in *Discrete Comput. Geom.*, Vol. 12 (1994), 281–289. Prelim. version *SoCG 1994*.

8 T. K. Dey and N. Shah. Many face complexity in incremental convex arrangements. *Information Processing Letters*. Vol. 51 (1994), 227–231.

9 T. K. Dey. On counting triangulations in d dimensions. *Comput. Geom. Theory Applications.* Vol. 3 (1993), 315–325.

10 C. Bajaj and T. K. Dey. Polygon nesting and robustness. *Information Processing Letters*. Vol. 1 (1990), 23-32.

11 D. Chithraprasad, S. P. Pal and T. K. Dey. Visibility with multiple diffuse reflections. *Comput. Geom. Theory Applications*, Vol. 10 (1998), 187–196.

12 B. Aronov, A. Davis, T. K. Dey, S. P. Pal and D. C. Prasad. Visibility with multiple reflections. *Discrete Comput. Geom.*, Vol. 20, No. 61 (1998), 61–78. Prelim. version *5th SWAT (1996)*, LNCS 1097, 284–295.

13 B. Aronov, A. Davis, T. K. Dey, S. P. Pal and D. C. Prasad. Visibility with one reflection. *Discrete Comput. Geom.*, Vol. 19, No. 4 (1998), 553-574. Prelim. version *SoCG 1995*, 316–325.

Book Chapters/Reports.

1 T. K. Dey. Smooth surface and volume meshing. In Encyclopedia of Algorithms, New York: Springer US, 2015.

2 T. K. Dey. Meshing piecewise smooth complexes. In Encyclopedia of Algorithms, New York: Springer US, 2015.

3 T. K. Dey. Delaunay mesh generation of three dimensional domains. Tessellations in the sciences: Virtues, Techniques and Applications of Geometric Tilings, eds. R. van de Weygaert, G. Vegter, J. Ritzerveld and V. Icke, Springer-Verlag, 2009.

4 T. K. Dey. Contributed chapter on Curve and Surface Reconstruction in *CRC Handbook of Computational Geometry*, eds. O' Rourke and Goodman, CRC press 2003.

5 T. K. Dey. Section 13.4 on polyhedra of *CRC Handbook of Discrete and Combinatorial Mathematics*, Ken Rosen, Editor, CRC press 2000.

6 I am one of many authors. Emerging challenges in computational topology. *A report for NSF*, (1999).

10. Guidance at Post Doctoral Level.

    (a) Abhishek Rathod, Post-doc 2022-2023, currently Post-doc at Ben-Guiron University

    (b) Mustafa Hajij, Post-doc 2018-2019, currently faculty at University of San Francisco.

    (c) Mickaël Buchet, Post-doc 2015, currently research scientist at AIMR, Tohoku U., Japan.

    (d) Ramsay Dyer, Post-doctoral fellow 2010, currently research scientist at INRIA, France.

    (e) Joachim Giesen, Post-doctoral fellow 2000-2001, currently Prof. at u. of Jena, Germany.

    (f) Hyuckje Woo, Post-doctoral fellow 2001–2003, currently Prof. at KINST, Korea.

11. Guidance at Doctoral Level.

    - Current PhD advisees
      (a) Simon Zhang, Expected PhD, passed PhD thesis defense (Fall 2024)
      (b) Shreyas Samaga, joined (Fall, 2021)
      (c) Andrew Haas, joined (Fall 2022)
      (d) Gilberto Gonzalez, joined (Fall 2023)
      (e) Shubhankar Varshney, joined (Fall 2024)
    - Past PhD advisees from Purdue
      (a) T. Hou. Homological Representatives in Topological Persistence, May 2022, currently faculty at DePaul University
      (b) R. Slechta. Capturing Changes in Combinatorial Dynamical Systems , May 2022, currently at U. Michigan.
      (c) C. Xin. Decomposition and Stability of Multiparameter Persistence Modules. July 2023, currently post-doc at Rutgers U.
      (d) S. Mukherjee. Unveiling patterns in data:harnessing computational topology in machine learning. December, 2023.
    - Other Past PhD advisees
      (a) D. Chithra Prasad, PhD, New Visibility Problems: Combinatorial and Computational Complexities, March, 1997.
      (b) J. Hudson, PhD, Processing large point cloud data in computer graphics, June, 2003, currently Prof. at Swansee University, Ohio.

(c) W. Zhao, Shape dimension and medial axis from samples, summer, 2003, currently at Siemens UGS PLM software.

(d) S. Goswami, Sample based shape modeling and matching, December, 2004, currently at EXA.

(e) T. Ray, Quality meshing of bounded domains, July 2006. Currently Prof. at BITS, Hyderabad, India.

(f) J. Sun, Reconstructing and analyzing shapes, July 2007, currently Prof. Tsinghua University, China.

(g) J. Levine, Delaunay Meshing, December 2009, currently Prof. at Clemson University, Computer Science.

(h) K. Li, Computing shape features, July 2010, currently post-doctorate at Texas A& M University.

(i) P. Ranjan, Discrete Laplace Operator: Theory and Applications, July 2012.

(j) O. Busaryev, Geometry and topology of cycles and meshes, December 2012, currently Google Research.

(k) F. Fengtao, Topological analysis of shape and data, December 2013, currently at Google Research.

(l) A. Slatton, Scalable algorithms for Delaunay mesh generation, July 2014.

(m) L. Wang, Reconstruction and decomposition of objects from sampled point clouds, July 2014, currently at Google Research.

(n) D. Shi. Computing topological features for data analysis, July 2017, Google Research.

(o) A. Rossi. Temporal clustering of finite metric spaces and spectral k-clustering, July 2017.

(p) J. Wang. Algorithms for guaranteed denoising of data and their applications, December, 2019.

(q) S. Mandal. Applications of persistent homology and cycles, June, 2020.

(r) T. Li. Computing minimal homology basis, June 2020.

12. Guidance at Masters Level.

(a) L. Molnar, On approximating and simplifying the medial axis, December, 2005.

(b) N. Leekha, A single pass Voronoi based surface reconstruction, March, 2001.

(c) J. Hudson, Supercocone: surface reconstruction from large data sets, September, 2001.

(d) A. Roy, Topological triangulations, December, 1997.

13. Funding.

- Funding during Purdue employment

(a) PI, AF: Small: Improved Algorithms for Topological Data Analysis, NSF, USA, $593000, 2025–2028 (got confirmation of funding from program director)

(b) PI, CDS& E-MSS, Multiparameter topological data analysis, NSF, USA $200,000, 2023-2026.

(c) PI, AF Small: Expanding the reach of topological data analysis, NSF, USA $350,000, 2020-2024.

(d) PI, TDA for cytometry data, Ohio Children's Hospital, Columbus, Ohio, $75000, 2021–2023.

(e) PI, TRIPODS+X:Improving Templated Microstructures via Topological Data Analysis, NSF, USA $\$300,000$, 2018–2021.

- Funding before Purdue employment

(a) PI, TRIPODS: Topology, Geometry, and Data Analysis (TGDA@OSU):Discovering Structure, Shape, and Dynamics from Data, NSF, USA, $\$1500000$, 2017–2020.

(b) co-PI, RTG: Algebraic Topology and its applications, NSF, USA, $\$750,000$, 2016–2021.

(c) co-PI, small: Analyzing complex data with a topological lens, NSF, USA, $\$499,478$, 2015–2018.

(d) PI, small: Topological data analysis for big and high dimensional data, NSF, USA, $\$496,321$, 2013-2016.

(e) PI, Small: Analyzing Spaces and Scalar Fields via Point Clouds, NSF, USA, $\$499,761$, 2011–2014.

(f) co-PI, Medium: Collaborative Research: Optimality in Homology - Algorithms and Applications, NSF, USA, $\$320,000$, 2011–2015.

(g) PI, "Reconstructing and inferring topology and geometry from point cloud data", NSF, USA, $\$460,000$, 2009–2012.

(h) PI, "Inferring topology and geometry from dynamic shapes", NSF, USA, $\$220,000$, 2008-2011.

(i) PI, "Nonsmoothness in meshing and reconstruction", NSF, USA, $\$429,000$, 2006-2009.

(j) PI, "Implementation-friendly algorithms for surface and volume meshing", NSF, USA, $\$180,000$, 2004-2007.

(k) PI, "Experimenting with Cocone software for salt bags", Shell, USA, $\$40,000$, 2005-2006.

(l) PI, "Handling large, noisy and under-sampled data for surface reconstruction", Army Research Office, $\$227,076$, 2002-2005.

(m) Co-PI, "Geodetic surfaces : Understanding their geometry and topology", NSF, USA, $\$250,000$, 2003-2006.

(n) PI at OSU (with Guibas and Carlsson from Stanford), "Shape analysis from point cloud data", NSF, USA, $\$700,000$, 2002-2005.

(o) Co-PI with Saalfeld, "Mathematical principles for spatial data management", NIMA, USA, $\$446,000$, 2001-2004.

(p) PI, "Computing with shapes: reconstruction and decimation", NSF, USA, $\$215,221$, 2000-2003.

(q) PI, "Sample based geometric modeling", NSF, USA, $\$66,000$, 2001–2003.

(r) PI, "Triangulations: Algorithms, Combinatorics and Topology", NSF, USA, $\$85,000$, 1994-1997.

(s) PI, "Computational Topology", DST young scientist project, India, Rs. 75,000, 1996–1998.

(t) PI, "Geometric Modeling with Simplicial Complexes", Dept. of Science and Technology, Govt. of India, Rs. 11,00,075, 1997–2000.

(u) PI, "Robust Geometric Computations under Finite Precision for CAD/CAM and Solid Modeling", AICTE, Govt. of India, Rs. 5,000,00, 1997–2000.

14. Editor/Program Chair.

(a) co-Chair, Program Committee, ACM Symposium on Computational Geometry, (SoCG), 2012.

(b) co-Chair, Papers Committee, International Meshing Roundtable (IMR), 2002.

(c) Member, Editorial board, Discrete and Computational Geometry, 2007– .

(d) Memebr, Editorial board, Computational Geometry: Theory & Applications.

(e) Member, Editorial board, Journal of Computational Geometry, 2010–2012.

(f) Member, Editorial board, Graphical Models, 2009-2017.

(g) Member, Editorial board, CAD, 2015-2018.

(h) Member, Editorial board, Transactions on Computational Sciences, Springer-Verlag

(i) Guest Editor, Engineering with Computers, Springer-Verlag, Special issue on selected papers from 11th Meshing Roundtable Conference (2003).

(j) Guest Editor, International Journal on Foundations of Computer Science, Special issue on Triangulations (2001).

15. Program Committee Member.

(a) Member, program committee, SoCG 2024

(b) Member, program committee, STOC 2024

(c) Member, program committee, Point Graphics 2004, 2005, 2006, 2007.

(d) Member, program committee, ACM Symposium on Solid Modeling and Applications, 2003-2023

(e) Member, program committee, Shape Modeling International, 2005-2020.

(f) Member, program committee, Symposium on Geometry Processing, 2009-2023.

(g) Member, program committee, TopoinfoVis 2011.

(h) Member, program committee, Pacific Graphics, 2006.

(i) Member, program committee, International Symposium on Algorithms and Computations (ISAAC 06), 2006.

(j) Member, SWAT 2014.

(k) Member, organizing committee, SIAM CAGD conference, 2005.

(l) Member, program committee, Annual Symposium on Computational Geometry (SoCG),1998, 2003, 2012, 2019.

(m) Member, program committee, 14th Annual ACM-SIAM Symposium on Discrete Algorithms(SODA 03), SODA 2014.

(n) Member, program committee, ICCSA 2003.

(o) Member, program committee, 11th International Meshing Roundtable conference, (IMR 02).

(p) Organizer, DIMACS Workshop on Algorithm Challenge in Surface Reconstruction, 2003.

(q) Member, program committee, Foundations of Software Technology and Theoretical Computer Science (FSTTCS) 1995,1996, 1997 and 2003.

(r) Organizer, Mini-Symposium on Geometric Modeling with Point Samples, SIAM Geometric Design Conference, Seattle, November 2003.

(s) Organizer of a Workshop on Algorithm Challenge for Surface Reconstruction as a part of year long special activity by DIMACS on Computational Geometry, April, 2003.

16. Invited Plenary Talks.

(a) Conf. Applied topology in frontier sciences, NUS, July 2022

(b) Computational topology, Canadian Conf. Comput. Geom. (2014).

(c) Computational geometry and topology meet geometric modeling, SIAM-GD SPM 2011.

(d) Delaunay refinement and its localization for meshing, IMR 2011.

(e) Geometry and topology from point cloud data, Workshop on Algorithms and Computation (WALCOM 2011), February 2011.

(f) Delaunay Meshing of Surfaces, 17th Symposium on Algorithms and Computations, December, 2006.

(g) Delaunay Meshing of Surfaces, 15th Fall Workshop on Computational Geometry, November, 2005.

(h) Delaunay and Voronoi diagrams in shape modeling, ECG 2004, Paris, April 2004.

(i) Computing shapes from point cloud data, ALGO 2002 (combines three conferences ESA,APPROX,WABI on algorithms), Rome, Italy, September, 2002.

(j) Shape dimension from samples, Conference on Algebraic Topological Methods in Computer Science, Stanford U., August, 2001.

(k) Detecting undersampling in surface reconstruction, Workshop on Algorithm Engineering as a New Paradigm, Kyoto University, Japan, October, 2000.

(l) Sample based geometric modeling, SME workshop on solid modeling, Detroit, November, 2000.

(m) Recent Developments in Computational Topology, National Seminar on Theoretical Computer Science, TIFR, Bombay, India, August 1995.

17. Organized events/Invited Tutorials

(a) Workshop on Computational Persistence, organizer, November, 2021, November 2022, September 2023, September 2024.

(b) Workshop on TDA, organizer, 2019.

(c) TGDA@OSU 2016 workshop, organizer, 2016.

(d) Mini-Symposium, SIAM Geometric Design, 2003, 2005.

(e) Computational Topology and data analysis, Intensive Research Program in Discrete, Combinatorial and Computational Geometry, CRM, Spain, April , 2018.

(f) Topological data analysis, Tutorial at Winter School on Comput. Mathematics, Bedlewo, Poland, Feb. 2016.

(g) Delaunay mesh generation of surfaces and volumes, Tutorial at U. of Aachen, Germany, July, 2009.

(h) Surface reconstruction and meshing, Tutorial at ADFOCS06, MPI, Germany, July, 2006.

(i) Surface and Volume meshing with Delaunay refinement, Tutorial for CAD/Graphics 2005, Hong-Kong, December, 2005.

(j) Reconstruction and feature extraction from point cloud data with mathematical reasoning, SIAM conference on Geometric Design, October, 2005.

(k) Surface meshing from point cloud. Short course, 11th International Meshing Roundtable, September, 2002.

(l) Modeling from points. Tutorial for Fall School on Computational Geometry, Freie Universität Berlin, October, 2003.

18. Invited Talks at Universities and Special Workshops.

(a) Workshop on combinatorial topological framework for non-linear Dynamics, CRM, U. Montreal, Canada, October, 2024.

(b) Workshop on topological data analysis, U. Albany, AMS meeting 2024.

(c) Workshop on combinatorial dynamical systems, ICIAM, Japan, August, 2023.

(d) Workshop Discrete and computational geometry, shape analysis, and applications, Rutgers U., May, 2023.

(e) Algebraic combinatorics and categorical theory, AMS meeting, 2022.

(f) Rectangular approximation of 2-parameter persistence modules, Workshop on multiparamter persistence, Lorentz center, 2021.

(g) Computing homology cycles with certified geometry, DiffCVML workshop, CVPR 2020.

(h) Multiparameter persistence homology, BIRS-CMO, Mexico, August, 2018.

(i) Nerves can kill and also serially, workshop on computational topology, CG week, June 2018.

(j) Mutiscale mapper: A topological summarization framework, ACAT workshop, IST-Austria (2015)

(k) Data sparsification in topology inference, PIMS conference on Algebraic Topology- Methods, Computation and Science 6 (ATMCS6), May 2014.

(l) Computing topological persistence for simplicial maps, IMA special workshop on topology and geometry of networks and discrete metric spaces, May, 2014.

(m) Graph induced complexes, IMA special workshop on homology and cohmology computation, November, 2013.

(n) Better handles and tunnels, workshop on geometric computing, SoCG 2013.

(o) Delaunay mesh generation, Oberwolfach workshop on Triangulations, 2012. SoCG 2013 special workshop on mesh generation.

(p) Computing homology cycles with certified geometry, Computational Topology workshop, Fields Institute, 2011, and Institute of Advanced Studies, Princeton, 2012.

(q) Computing homology cycles with certified geometry, Special workshop in geometric computing, IIT new Delhi, November 2010 and George Washington University, September 2010.

(r) Cut locus and topology from point data, Workshop on machine learning, U. of Chicago, June, 2009. BIRS workshop on data analysis, March, 2009.

(s) Lifting the curse of slivers from surface reconstruction, BIRS workshop on computational mathematics on discrete surfaces, February, 2009.

(t) Delaunay meshing of piecewise smooth surfaces, volumes, and complexes, Colloquium, Penn State U., April 2008.

(u) Computing handle and tunnel loops on surfaces, Colloquium, Washington U. at St. Louise, February, 2008.

(v) Delaunay meshing of piecewise smooth complexes, GEOTOPAL workshop, Saclay, France, May 2007.

(w) On computing handles and tunnels. Dagstuhl workshop on Comput. Geom., Germany, March 2007.

(x) Delaunay meshing of surfaces for different input forms. Workshop on Tessellations in the Sciences, Lieden University, Netherlands, March 2006.

(y) Meshing surfaces and volumes, Polytechnic University, Brooklyn, New York, October, 2005.

(z) Sample Based Geometric Modeling. Colloquium series, U. of Notredam, Indiana, September, 2004.

() Sample based geometric modeling. Colloquium series, Marquette University, Wisconsin, March 2004.

() Computing shapes and their features from their point samples. DIMACS Workshop on Computer Aided Design and Manufacturing, Rutgers University, October 2003.

() Cocone algorithm and its variants for surface reconstruction. DIMACS workshop on surface reconstruction, May 2003.

() Shape segmentation and matching with flow discretization. Dagstuhl seminar on Computational Geometry, March, 2003.

() Quality meshing with weighted Delaunay triangulations. U. of Illinois Urbana-Champaign, April, 2003.

() On counting triangulations using crossings in geometric graphs. DIMACS workshop on geometric graph theory, August 2002.

() Shape reconstruction from samples with COCONE. U. of Florida, Gainesville, March, 2002.

() Detecting undersampling in surface reconstruction. Max-Planck Institute, Germany, July, 2001.

() Surface reconstruction simplified. Duke Univ. and Univ. of North Carolina, Chapel Hill, 2000.

() Reconstructing curves and surfaces from samples. Univ. of Wisconsin-Milwaukee, 1999.

19. Software Development.

(a) Leading the CGTDA group at Purdue developing several software for Topological Data Analysis (TDA).

(b) Led the JYAMITI group at The Ohio State University which developed the well known COCONE software for surface reconstruction from point clouds. This software has been downloaded by thousands of people from academia, research labs and industries (more than 12 thousand downloads). Also led the development of DELPSC software which has been adopted by Synopsys. Led creating the HANTUN/SHORTLOOP/SIMPERS/SIMBA software used by researchers workin topological data analysis.

(c) Finger print recognition system, CMC Limited, Hyderabad, India.

20. Teaching Experience.

(a) Purdue University, USA.
Course: Topological Data Analysis, Spring 2021, Spring 2023, Foundations of computing, Fall 2022, Algorithm Design, Analysis, and Implementation, Spring 2022, Fall 2023,Computational Geometry, Spring 2024, Fall 2024.

(b) The Ohio State University, USA.
Courses: Geometric modeling, Shape modeling in graphics, Formal Languages and Automata Theory, Algorithms, Advanced algorithms, Computational topology.

(c) I.I.T. Kharagpur, India.
Courses: Data Structures, Applied Graph Theory, Computer Graphics, Design and Analysis of Algorithms, Computational Geometry, Introduction to Computing.
Laboratories: Introduction to Computing, Programming Methodology and Data Structures, Software Laboratory, Information Processing.

(d) Indiana University-Purdue University, USA.
Courses: Theory of Computation, Algorithms, Data Structures, Operating Systems.
Laboratories: Data Structures.

(e) University of Illinois at Urbana-Champaign, USA.
Courses: Computational Geometry.

(f) Purdue University, USA.
Courses: Numerical Analysis.

21. Industrial Experience.

I worked as a systems engineer from 1987 to 1988 in the R&D section of CMC Ltd., Hyderabad. I was involved in a project on "Automatic finger-print recognition system". Specifically, I developed a quality software for matching "chance prints" for which I was given an OUTSTANDING PERFORMANCE AWARD (1988).

22. Academic Awards.

(a) ACM Fellow, 2018

(b) IEEE Fellow, 2017.

(c) SMA Fellow, 2019

(d) Lumley Research award, Engineering College, The Ohio State U. (2010) and (2004).

(e) Selected for Humboldt Fellowship from Humboldt Foundation, Germany (1998).

(f) Received Young Scientist award from DST, Govt. of India (1995).

(g) Awarded David Ross Fellowship by Purdue University, USA, (1989).

(h) Received National Talent Search Scholarship from NCERT, India (1981–1985).

(i) Received National merit scholarship from Govt. of India (1975 – 1981).

23. Membership of Professional Institutions/Bodies.

(a) Dean of science search committee, Purdue, 2023.

(b) College Faculty search on Data Science, Purdue, 2022, 2023.

(c) Chair, Faculty search (Foundations of DS), Purdue CS, 2020-2021.

(d) Interim Chair, Dept. of CSE, The Ohio State U., 2019–2020.

(e) Chair, Graduate Admissions, Dept. of CSE, The Ohio State U., 2005–2018.

(f) Member/Chair, Executive Board, Solid Modeling Association, 2008–2011

(g) Member, Association for Computing Machinery, ACM.

(h) Member, IEEE

(i) Member, Advisory Board, Indian Association for Research in Computing Science (IARCS), 1998.