Curriculum Vitæ

Yusu Wang
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Research Interests

Discrete and computational geometry. Computational and applied topology. Topological data analysis. Applications of topological / geometric methods to practical domains such as computational biology, machine learning, visualization and computer graphics.

Education

2000 – 2004 **Ph.D.**, Computer Science, Duke University, USA
Research supervised by Prof. Pankaj K. Agarwal and Prof. Herbert Edelsbrunner
Thesis title: Shape Representation and Analysis in Structural Biology Applications
(*Received* **Best PhD. Dissertation Award**, *CS Dept, Duke U., 2004.*)

1998 – 2000 **M.Sc.**, Computer Science, Duke University, USA
Research supervised by Prof. Pankaj K. Agarwal
Thesis title: Fast Occlusion Culling Algorithms for Walkthrough Applications

1993 – 1998 **B.Sc.** (*Graduated with First Class Honors*), Computer Science, Tsinghua University, China
Thesis supervised by Prof. Zesheng Tang
Thesis title: Reconstruction of 3D Anatomical Structures from 2D Medical Images

Employment

2018 – 2019 **Faculty co-lead:** CoP on *Fundations* for TDAI@OSU (Translational Data Analytics Institute)

2017 – present **Professor:** Computer Science and Engineering, OSU.

2011 – 2017 **Associate Professor:** Computer Science and Engineering, OSU.

09/2012–06/2013 **Visiting Prof:** Institute of Science and Technology, Austria.

2005 – 2011 **Assistant Professor:** Computer Science and Engineering, OSU.

2004 – 2005 **Postdoctoral Fellow:** Computer Science Department, Stanford University.

Honors & Awards

- Best Paper Award at ACM SIGSPATIAL GIS (2015)
- Best Student Paper Award at Conf. Learning Theory (COLT) (2015)
- Lumley Research Award, College of Engineering, OSU (2011)
- A Best Paper Award, Eurovis (2010)
- Top Reviewer for journal *Computational Geometry: Theory and Applications* (2008)

- U.S. National Science Foundation (NSF) Career Award (2008)
- U.S. Department of Energy (DOE) Early Career Principal Investigator (ECPI) Award (2006)
- Dept. Best Ph.D Dissertation, Duke University (2004)
- Department service award, Duke University (2002 - 2003).

Funding and Grants

- *RI:Small:Learning discrete structure from continuous spaces*, National Science Foundation, IIS-1815697, co-PI, (08/2018–07/2021).
- *TRIPODS+X:EDU: An MBI TGDA+Neuro Program for Undergraduates*, National Science Foundation, CCF-1839356, co-PI, (10/2018-09/2021).
- *TRIPODS: Topology, Geometry, and Data Analysis (TGDA@OSU):Discovering Structure, Shape, and Dynamics in Data*, National Science Foundation, CCF-1740761, co-PI, (10/2017–09/2020).
- *AitF: Collaborative Research: Topological algorithms for 3D/4D cardiac images: Understanding complex and dynamic structures*, National Science Foundation, CCF-1733798, PI. (09/2017–08/2020).
- *NIH R01: Methods from computational topology and geometry for analyzing neuronal tree and graph data*, National Institute of Health (NIH), R01 EB022899-01, MPI. (09/2016–06/2019).
- *RTG: Algebraic Topology and Its Applications*, National Science Foundation, DMS-1547357, co-PI, (06/2016–06/2021).
- *AF:Small:Collaborative Research:Geometric and topological algorithms for analyzing road network data*, National Science Foundation, CCF-1618247, PI, (07/2016–06/2018).
- *AF:Small:Analyzing complex data with a topological lens*, National Science Foundation, CCF-1526513, PI. (08/2015–08/2018).
- *IIS:EAGER:The exploration of geometric and non-geometric structure in data*, National Science Foundation, IIS-1550757, co-PI, (07/2015–02/2017).
- *AF: Small: Geometric Data Processing and Analysis via Light-weight Structures*, National Science Foundation, CCF-1319406, single PI. (06/2013 – 05/2017).
- *AF:small: analyzing spaces and scalar fields via point clouds*, National Science Foundation, CCF-1116258, co-PI. (06/2011–05/2015).
- *AF: EAGER: Collaborative Research: Integration of Computational Geometry and Statistical Learning for Modern Data Analysis*, National Science Foundation, CCF-1048983, PI. (09/2010–09/2012).
- *Similarity-Based Indexing and Integration of Protein Sequence and Structure Databases*, National Science Foundation, DBI-0750891, co-PI. (07/2008–07/2012).
- *CAREER: Geometric and Topological Methods in Shape Analysis, with Applications in Molecular Biology*, National Science Foundation, CCF-0747082, single PI. (02/2008–02/2013).
- *ECPI: Feature extraction, characterization, and visualization for protein interaction via geometric and topological methods*, Department of Energy (DOE). DE-FG02-06ER25735. single PI.(09/2006–09/2009).

Publications

Refereed Conferences

Note: publications in certain graphics venues, (specifically, SIGGRAPH, SIGGRAPH Asia, and Sympos. Geom. Processing,) also appeared in special issues of some journals (specifically, in ACM Trans. Graph. and Comput. Graph. Forum). These publications are only listed **once** *below, and not listed in the section for Journal publications.*

[1] T. K. Dey, J. Wang and Y. Wang. Graph reconstruction by discrete Morse theory. In *Sympos. Comput. Geom. (SoCG)*, 31:1–31:15, 2018.

[2] M. Adamaszek, H. Adams, E. Gasparovic, M. Gommel, E. Purvine, R. Sazdanovic, B. Wang, Y. Wang and L. Ziegelmeier. Vietoris-Rips and Cech complexes of metric gluings. In *Sympos. Comput. Geom. (SoCG)*, 3:1–3:15, 2018.

[3] J. Eldridge, M. Belkin and Y. Wang. Unperturbed: spectral analysis beyond Davis-Kahan. In *Intl. Conf. Algorithmic Learning Theory (ALT)*, 321–358, 2018.

[4] T. K. Dey, T. Li and Y. Wang. Efficient algorithms for computing a minimal homology basis. In *13th Latin American Theoretical Informatics Symposium (LATIN)*, 376–398, 2018.

[5] T. K. Dey, J. Wang and Y. Wang. Improved road network reconstruction using Discrete Morse theory. In *25th ACM SIGSPATIAL Intl. Conf. Adv. Geographic Infor. Sys. (ACM SIGSPATIAL)*, 2017.

[6] Y. Zhang, Y. Wang and S. Parthasarathy. Visualizing attributed graphs via terrain metaphor. In *23rd SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)*, 1325–1334, 2017.

[7] X. Ni, N. Quadrianto, Y. Wang and C. Chen. Composing tree graphical models with persistent homology features for clustering mixed-type data. In *34th Intl. Conf. Machine Learning (ICML)*, 2622–2631, 2017.

[8] S. Parthasarathy, D. Sivakoff, M. Tian and Y. Wang. A quest to unravel the metric structure behind perturbed networks. In *Sympos. Comput. Geom. (SoCG)*, 53:1–53:16, 2017.

[9] T. Dey, F. Memoli and Y. Wang. Topological Analysis of Nerves, Reeb Spaces, Mappers, and Multiscale Mappers. In *Sympos. Comput. Geom. (SoCG)*, 36:1–36:16, 2017.

[10] M. Buchet, T. Dey, J. Wang and Y. Wang. Declutter and Resample: Towards parameter free denoising. In *Sympos. Comput. Geom. (SoCG)*, 23:1–23:16, 2017.

[11] A. Sidiropoulos, D. Wang and Y. Wang. Metric embeddings with outliers. In *ACM-SIAM Sympos. Discrete Alg. (SoDA)*, 670–689, 2017.

[12] T. K. Dey, Z. Dong and Y. Wang. Parameter-free topology inference and sparsification for data on manifolds. In *ACM-SIAM Sympos. Discrete Alg. (SoDA)*, 2733–2747, 2017.

[13] P. Wu, C. Chen, Y. Wang, S. Zhang, C. Yuan, Z. Qian, D. Metaxas, L. Axel. Optimal topological cycles and their application in cardiac trabeculae restoration. In *25th Biennial Intl. Conf. Information Processing in Medical Imaging (IPMI)*, pages 80-92, 2017. **Selected for Oral presentation.**

[14] J. Eldridge, M. Belkin and Y. Wang. Graphons, mergeons, and so on! In *Neural Information Processing Systems (NIPS)*, 2307-2315, 2016. **Selected for Oral Presentation.**

[15] T. K. Dey, D. Shi and Y. Wang. SimBa: An efficient tool for approximating Rips-filtration persistence via simplicial batch-collapse. In *24th Euro. Sympos. Alg. (ESA)*, 35:1 – 35:16, 2016.

[16] T. K. Dey, F. Memoli and Y. Wang. Multiscale Mapper: Topological summarization via codomain covers. In *ACM-SIAM Sympos. Discrete Alg. (SoDA)*, 2016, 997–1013.

[17] S. Wang, Y. Wang and Y. Li. Efficient Map Reconstruction and Augmentation via Topological Methods. In *23rd ACM SIGSPATIAL Intl. Conf. Adv. Geographic Infor. Sys. (ACM SIGSPATIAL)*, 2015. Received the **Best Paper Award.**

[18] J. Eldridge, M. Belkin and Y. Wang. Beyond Hartigan consistency: Merge distortion metric for hierarchical clustering. In *Conf. Learning Theory (COLT)*, 2015. Received the **Best Student Paper Award.**

[19] U. Bauer, E. Munch and Y. Wang. Strong equivalence of the interleaving and functional distortion metrics for Reeb graphs, In *Proc. Sympos. Comput. Geom. (SoCG)*, pages 461–475, 2015.

[20] T. Dey, D. Shi and Y. Wang. Comparing graphs via persistence distortion. In *Proc. Sympos. Comput. Geom. (SoCG)*, pages 491–506, 2015.

[21] P. K. Agarwal, T. Molhave, M. Revsbak, I. Safa, Y. Wang and J. Yang. In *Proc. Sympos. Comput. Geom. (SoCG)*, pages 796–811, 2015.

[22] M. Buchet, F. Chazal, T. Dey, F. Fan, S. Oudot and Y. Wang. Topological analysis of scalar fields with outliers. In *Proc. Sympos. Comput. Geom. (SoCG)*, pages 827–841, 2015.

[23] P. K. Agarwal, K. Fox, A. Nath, A. Sidiropoulos and Y. Wang. Computing the Gromov-Hausdorff Distance for Metric Trees. *ISAAC*, pages 529–540, 2015.

[24] Q. Que, M. Belkin and Y. Wang. Learning with Fredholm kernels. In *Neural Information Processing Systems (NIPS)*, pages 2951–2959, 2014.

[25] U. Bauer, X. Ge and Y. Wang. Measuring distance between Reeb graphs. In *Proc. 29th Annu. ACM Sympos. Comput. Geom. (SoCG)*, pages 464–473, 2014.

[26] S. Wang, Y. Wang and R. Wenger. The JS-Graph of merge and split trees. In *Proc. 29th Annu. ACM Sympos. Comput. Geom. (SoCG)*, pages 539–548, 2014.

[27] T. K. Dey, F. Fan and Y. Wang. Computing Topological Persistence for Simplicial Maps. In *Proc. 29th Annu. ACM Sympos. Comput. Geom. (SoCG)*, pages 345–354, 2014.

[28] J. Chen, X. Ge, L. Wei, B. Wang, Y. Wang, H. Wang, Y. Fei, K. Qian, J. Yong, W. Wang. Bilateral blue noise sampling. In *SIGGRAPH Asia)*, also appeared in a special issue of the journal *ACM Trans. Graph.*, 32(6): 216, 2013.

[29] T. K. Dey, F. Fan and Y. Wang. An efficient computation of handle and tunnel loops via Reeb graphs. In *SIGGRAPH 2013)*, also appeared in a special issue of the journal *ACM Trans. Graph.*, 32(4): 32, 2013.

[30] E. W. Chambers and Y. Wang. Measuring similarity between curves on 2-manifolds via homotopy area. In *Proc. 28th Annu. ACM Sympos. Comput. Geom. (SoCG)*, pages 425–434, 2013.

[31] T. K. Dey, F. Fan and Y. Wang. Graph induced complex on point data. In *Proc. 28th Annu. ACM Sympos. Comput. Geom. (SoCG)*, pages 107–116, 2013.

[32] T. K. Dey, P. Ranjan and Y. Wang. Weighted Graph Laplace Operator under Topological Noise. In *Proc. 24th ACM-SIAM Sympos. Discrete Alg. (SoDA)*, pages 197–208, 2013.

[33] M. Belkin, Q. Que, Y. Wang and X. Zhou. Towards understading complex spaces: graph Laplacians on manifolds with singularities and boundaries. In *25th Conf. Learning Theory (COLT)*, Journal of Machine Learning Research – Proceedings Track 23, pages 36.1–36.26, 2012.

[34] T. K. Dey, X. Ge, Q. Que, I. Safa, L. Wang, and Y. Wang. Feature-Preserving Reconstruction of Singular Surfaces. In *Sympos. Geom. Processing.*, also appeared in a special issue of the journal *Comput. Graph. Forum*, 31(5): 1787-1796, 2012.

[35] O. Busaryev, S. Cabello, C. Chen, T. K. Dey and Y. Wang. Annotating Simplices with a Homology Basis and Its Applications. In *SWAT*, pages 189–200, 2012.

[36] X. Ge, I. Safa, M. Belkin, and Y. Wang. Data Skelentonization via Reeb Graphs. In *Proc. 25th Annu. Conf. Neural Information Processing Systems (NIPS)*, pages 837–845, 2011.

[37] T. K. Dey and Y. Wang. Reeb graphs: approximation and persistence. In *Proc. 26th Annu. ACM Sympos. Comput. Geom. (SoCG)*, pages 226–235, 2011.

[38] W. Harvey and Y. Wang Generating and exploring a collection of topological landscapes for visualization of scalar-valued functions. *Eurographics/IEEE Sympos. Visualization*, also appeared in a special issue of the journal *Comput. Graph. Forum*, 29 (3): 993–1002, 2010. Received a **Best Paper Award**.

[39] W. Harvey and Y. Wang. A Randomized $O(m \log m)$ Time Algorithm for Computing Reeb Graph of Arbitrary Simplicial Complexes. *Proc. 25th Annu. ACM Sympos. Compu. Geom. (SoCG)*, pages 267–276, 2010.

[40] T. K. Dey and J. Sun and Y. Wang. Approximating Loops in a Shortest Homology Basis from Point Data *Proc. 25th Annu. ACM Sympos. Compu. Geom. (SoCG)*, pages 166–175, 2010.

[41] T. K. Dey, P. Rajan, and Y. Wang. Convergence, Stability, and Discrete Approximation of Laplace Spectra. In *Proc. 21st ACM-SIAM Sympos. Discrete Alg. (SoDA)*, pages 650–663, 2010.

[42] T. K. Dey and K. Li and C. Luo and P. Rajan and I. Safa and Y. Wang. Persistent heat signature for pose-oblivious matching of incomplete models. In *Sympos. Geom. Processing,* also appeared in a special issue of the journal *Comput. Graph. Forum*, 29 (5): 1545–1554, 2010 .

[43] O. Busaryev, T. K. Dey and Y. Wang. Tracking a Generator by Persistence. In *COCOON*, pages 278–287, 2010.

[44] C. Luo, I. Safa, and Y. Wang. Estimating Gradients from Meshes and Point Clouds via Diffusion Metrics. In *Sympos. Geom. Process.*, also appeared in a special issue of the journal *Comput. Graph. Forum*, 28 (5): 1497–1508, 2009.

[45] C. Luo, J. Sun, and Y. Wang. Integral estimation from point clouds in d-dimensional space: A geometric view. In *Proc. 24th Annu. ACM Sympos. Comput. Geom. (SoCG)*, pages 116–124, 2009.

[46] M. Belkin, J. Sun, and Y. Wang. Constructing Laplace operator from point clouds in R^d. In *Proc. 20th ACM-SIAM Sympos. Discrete Alg. (SoDA)*, pages 1031–1040, 2009.

[47] K. Buchin, M. Buchin, and Y. Wang. Exact partial curve matching under the Frechet distance. In *Proc. 20th ACM-SIAM Sympos. Discrete Alg. (SoDA)*, pages 645–654, 2009.

[48] M. Belkin, J. Sun, and Y. Wang. Discrete Laplace Operator for Meshed Surfaces. In *Proc. 24th Annu. ACM Sympos. Comput. Geom. (SoCG)*, pages 278–287, 2008.

[49] Z. Zheng, K. Fan, P. Sinha, and Y. Wang. Distributed roadmap aided routing in sensor networks. In *IEEE MASS*, pages 347–352, 2008.

[50] H. Sun, H. Ferhatosmanoglu, M. Ota, and Y. Wang. Enhanced partial order curve comparison over multiple protein folding trajectories. In *Proc. Intl. Conf. Computational System Bioinformatics*, pages 299–310, 2007.

[51] Y. Wang. Relations between two common types of rectangular tiling. In *Intl. Symp. Algorithms and Computation*, pages 193–202, 2006.

[52] B. Aronov, S. Har-Peled, C. Kauner, C. Wenk, and Y. Wang. Fréchet distance for curves revisited. In *Proc. 14th Annu. European Sympos. Algorithms*, pages 52–63, 2006.

[53] S. Funke, L. Guibas, A. Nguyen, and Y. Wang. Distance-sensitive routing and information brokerage in sensor networks. In *Intl. Conf. Distributed Computing in Sensor Systems*, pages 234–251, 2006.

[54] Y. Wang and L. J. Guibas. Towards unsupervised segmentation of semi-rigid low-resolution molecular surfaces. In *Geometric Modeling and Processing*, pages 129–142, 2006.

[55] H. Wu, I. Liu, M. Wong, and Y. Wang. Post-placement voltage island generation under performance requirement. In *Intl. Conf. Computer Aided Design*, pages 309–316, 2005.

[56] Y. Wang, P. K. Agarwal, P. Brown, H. Edelsbrunner, and J. Rudolph. Coarse and reliable geometric alignment for protein docking. In *Pacific Symposium on Biocomputing*, pages 66–77, 2005.

[57] P. K. Agarwal, Y. Wang, and P. Yin. Lower bound for sparse euclidean spanners. In *Proc. 16th ACM-SIAM Sympos. Discrete Alg. (SoDA)*, pages 670–671, 2005.

[58] P. K. Agarwal, Y. Wang, and H. Yu. A 2D kinetic triangulation with near-quadratic topological changes. In *Proc. 20th Annu. ACM Sympos. Comput. Geom. (SoCG)*, pages 180–189, 2004.

[59] P. K. Agarwal, H. Edelsbrunner, J. Harer, and Y. Wang. Extreme elevation on a 2-manifold. In *Proc. 20th Annu. ACM Sympos. Comput. Geom. (SoCG)*, pages 357–365, 2004.

[60] P. K. Agarwal, S. Har-Peled, M. Sharir, and Y. Wang. Hausdorff distance under translation for points and balls. In *Proc. 19th Annu. ACM Sympos. Comput. Geom. (SoCG)*, pages 282–291, 2003.

[61] S. Har-Peled and Y. Wang. Shape fitting with outliers. In *Proc. 19th Annu. ACM Sympos. Comput. Geom. (SoCG)*, pages 29–38, 2003.

[62] P. K. Agarwal, H. Edelsbrunner, and Y. Wang. Computing the writhing number of a polygonal knot. In *Proc. 13th ACM-SIAM Sympos. Discrete Alg. (SoDA)*, pages 791–799, 2002.

[63] P. K. Agarwal, S. Har-Peled, N. Mustafa, and Y. Wang. Near-linear time approximation algorithms for curve simplification. In *Proc. 10th Annu. European Sympos. Algorithms*, pages 29 – 41, 2002.

[64] Y. Wang, P. K. Agarwal, and S. Har-Peled. An on-line occlusion culling algorithm for fast walkthrough in urban areas. In *Eurographics*, 2001.

Journal Papers

Note: publications in certain graphics venues, (specifically, SIGGRAPH, SIGGRAPH Asia, and Sympos. Geom. Processing,) also appeared in special issues of some journals (specifically, in ACM Trans. Graph. and Comput. Graph. Forum). These publications are only listed **once** *in the section for Conference publication, and* **not** *listed below.*

[1] P. K. Agarwal, K. Fox, A. Nath, A. Sidiropoulos, and Y. Wang. Computing the Gromov-Hausdorff distance for metric trees. *ACM Trans. Algorithms*, 14(2): 24:1–24:20 (2018).

[2] C. Luo, X. Ge, and Y. Wang. Uniformization and Density Adaptation for Point Cloud Data Via Graph Laplacian *Comput. Graph. Forum*, 37(1): 325-337 (2018).

[3] Y. Li, D. Wang, G. A. Ascoli, P. Mitra and Y. Wang. Metrics for comparing neuronal tree shapes based on persistent homology. *PLOS One*, 12(8): e0182184 (2017).

[4] T. K. Dey, F. Fan and Y. Wang. Graph induced complex on point data. *Comput. Geom.*, 48(8): 575–588 (2015).

[5] W. Harvey, I. Park, O. Rübel, V. Pascucci, P-T. Bremer, C. Li and Y. Wang. A collaborative visual analytics suite for protein folding research. *J. Mol. Graph. Modelling (JMG)*, 53: 59–71 (2014).

[6] T. K. Dey and Y. Wang. Reeb graphs: approximation and persistence. *Discrete and Computational Geometry (DCG)*, 49 (1): 46–73, 2013.

[7] H. Doraiswamy, N. Shivashankar, V. Natarajan and Y. Wang. Topological saliency. *Computers & Graphics.* 37(7): 787-799 (2013).

[8] H. Sun, A. Sacan, H. Ferhatosmanoglu, and Y. Wang. Smolign: A Spatial Motifs-Based Protein Multiple Structural Alignment Method. *IEEE/ACM Trans. Comput. Biology Bioinform.* 9(1): 249-261 (2012).

[9] C. Luo, I. Safa, and Y. Wang. Feature-aware streamline generation of planar vector fields via topological methods. *Computers & Graphics.* 36(6): 754-766 (2012).

[10] T. K. Dey, P. Ranjan, and Y. Wang. Eigen deformation of 3D models. *The Visual Computer.* 28(6-8): 585-595 (2012).

[11] T. K. Dey, J. Sun and Y. Wang. Approximating Cycles in a Shortest Basis of the First Homology Group from Point Data. *Inverse Problems.*, 27(9): 124004–124023, 2011.

[12] P. K. Agarwal, S. Har-Peled, M. Sharir and Y. Wang. Hausdorff distance under translation for points and balls. *ACM Trans. Alg.*, 6(4), 71.1–71.26, (2010).

[13] O. Busaryev, T. K. Dey and Y. Wang. Tracking a Generator by Persistence. *Discrete Math., Alg. and Appl.*, 2(4): 539-552 (2010).

[14] Y. Wang. Relations between two common types of rectangular tiling. *Internal. J. Comput. Geom. Appl.*, 108(6): 379–385, 2009.

[15] H. Sun, H. Ferhatosmanoglu, and Y. Wang. An enhanced partial order curve comparison algorithm and its application to analyzing protein folding trajectories. *BMC BioInformatics*, 9:344–354, 2008.

[16] Y. Wang. Approximating nearest neighbors among triangles in convex position. *Inf. Proc. Letters.*, 108(6): 379–385, 2008.

[17] L. J. Guibas and Y. Wang. Towards unsupervised segmentation of semi-rigid low-resolution molecular surfaces. *Algorithmica*, 48(4):433–438, 2007.

[18] A. Sacan, O. Ozturk, H. Ferhatosmanoglu, and Y. Wang. LFM-Pro: A tool for detecting significant local structural sites in proteins. *Bioinformatics*, 23(6):709–716, 2007.

[19] P. K. Agarwal, N. Mustafa, and Y. Wang. Efficient algorithms for contact-map overlap problem. *J. Comput. Biology (JCB)*, 14(2):131–143, 2007.

[20] H. Wu, M. Wong, I. Liu, and Y. Wang. Placement-proximity-based voltage island grouping under performance requirement. *IEEE Trans. Computer-Aided Design*, 26(7):1256–1269, 2007.

[21] V. Natarajan, Y. Wang, T. Bremer, V. Pascucci, and B. Hamann. Segmenting molecular surfaces. *Computer Aided Geometric Design (CAGD)*, pages 495–509, 2006.

[22] P. K. Agarwal, H. Edelsbrunner, J. Harer, and Y. Wang. Extreme elevation on a 2-manifold. *Discrete and Computational Geometry (DCG)*, 36(4):553–572, 2006.

[23] P. K. Agarwal, Y. Wang, and H. Yu. A 2D kinetic triangulation with near-quadratic topological changes. *Discrete and Computational Geometry (DCG)*, 36(4):573–592, 2006.

[24] P. K. Agarwal, S. Har-Peled, N. Mustafa, and Y. Wang. Near-linear time approximation algorithms for curve simplification. *Algorithmica*, 42(3/4):203–221, 2005.

[25] P. K. Agarwal, H. Edelsbrunner, and Y. Wang. Computing the writhing number of a polygonal knot. *Discrete and Computational Geometry (DCG)*, 32(1):37–53, 2004.

[26] S. Har-Peled and Y. Wang. Shape fitting with outliers. *SIAM Journal on Computing (SIAMCOM)*, 33(2):269–285, 2004.

Book Chapters

[1] V. Natarajan, P. Koehl, Y. Wang, and B. Hamann. Visual analysis of biomolecular surfaces. In L. Linsen, H. Hagen, and B. Hamann (editors), *Mathematical Methods for Visualization in Medicine and Life Sciences.* Springer Verlag, Mathematics and Visualization, 237–256, 2008.

Software Packages Developed

Denali: A software package for visulizing and exploring high-dimensional data using a terrain metaphor. Developed by PhD student J. Eldridge. Software, tutorial, documentation can be downloaded at `http://denali.cse.ohio-state.edu/` .

Ayla: A visual analytic platform for exploring high-dimensional molecular simulation data. Developed by PhD student W. Harvey. Software and documentation can be downloaded at `http://aylasoftware.nfshost.com/`.

Smolign, EPO, LFM-Pro: Software packages for comparing multiple protein structures, and for detecting local structural sites in proteins. Software can be downloaded at `http://bio.cse.ohio-state.edu/`.

Other: I maintain code such as for computing Reeb graph, discrete Laplace operator, and for metric graph reconstruction, on my webpage, next to the reference of respective papers.

Professional Service

Associate Editors:

SIAM Journal on Computing (SICOMP) (2019-)
Journal of Computatoinal Geometry (2010 – present).

Program committee Co-Chair:

35th Symposium on Computational Geometry (SoCG) 2019.

Program committee:

Joint Mathematics Meetings (JMM) Committee member, 02/2018 – 02/2020.
Symposium on Computational Geometry (SoCG) 2016.
SIAM / ACM Symposium on Discrete Algorithms (SoDA), 2015.
ACM Symposium on Computational Geometry, Video Track, 2014.
Intl. Conf. on Intelligent Systems for Molecular Biology (ISMB), 2014, 2015.
Symposium on Experimental Algorithms (SEA) 2014.
CG Week workshops associated with SoCG 2013.
ACM Symposium on Computational Geometry (SoCG) 2012.
European Symposium on Algorithms 2010.
SIAM workshop on Algorithm Engineering and Experiments 2010.
ACM Symposium on Computational Geometry (SoCG) 2006.

Organization activities:

Co-organizor of AMW workshop on Women in Computational Topology (WinCompTop) at JMM (Joint Mathematics Meeting) 2019.
Co-organizor of NSF CBMS Conference on Elastic Funcational and Shape Data Analysis, July 16–20, 2018.
Co-organizor of TGDA@OSU TRIPODS Center Workshop: Theory and Foundations of TGDA, May 21–26, 2018.
Co-organizor of TGDA@OSU TRIPODS Center Summer School, May 14–18, 2018.
Co-chair for Joint SoCG/STOC Workshop Day, 2016.
Co-organizor of TGDA@OSU Conference (Topology, Geometry and Data Analysis), May 16–20, 2016.
Co-organizor of AMS (American Math Society)-sponsored MRC summer conference on Discrete and Computational Geometry, June 10–16, Snowbird, Utah. 2012

Mentoring and outreach:

Mini-course on "Computational topology" in *Spring School on Discrete and Computational Geometry* at Simons Center for Geometry and Physics in Stony Brook, April, 2017.
One of a "SQuaREs " team (Structured Quartet Research Ensembles), which consists of six women computational topologists, supported by AIM research program, Aug., 2017.

Group leader for at the week-long *First Women in Computational Topology (WinCompTop) Workshop* held at IMA, Aug., 2016.
Short course lecturer on "Some topics in computational topology" at AMS Annual Joint Mathematics Meeting, Baltimore, 2014.

Refereeing:

Journals: Algorithmica, CAGD, CGF, CGTA, DCG, FoCM, IJCGA, SICOMP, TCBB, TVCG, IEEE Trans. Comput. Bio and Bioinformatics, etc.
Conferences: FOCS, SOCG, STOC, SODA, SIGGRAPH, IEEE Visualiation, EuroVis, RECOMB, ISMB, SGP, ESA, etc.
Grants: NSF panel reviews; U.S.-Israel Binational Science Foundation grant reviews.

Selected Recent Talks

1. CMO-BIRS Workshop on Multidimensional persistence, Oaxaca, Mexico, 2018.
2. School on Low-dimensional geometry and topology: Discrete and algorithmic aspects. Insitute Henri Poincaré, Paris, 2018.
3. 7th Mini-Symposium on Computatoina Topology, CG-Week, Budapest, 2018.
4. 6th Mini-Symposium on Computational Topology, CG-Week, Australia, 2017. **Keynote speaker.**
5. 2nd Workshop on Geometry and Machine Learning, CG-Week, Australia, 2017.
6. Workshop CATS (Computational & Algorithmic Topology, Sydney), 2017.
7. Dagstuhl Workshop on Topology, Computation and Data Analysis. 2017.
8. BIRS Workshop on Topological Data Analysis: Developing Abstract Foundations. 2017.
9. Lawrance Berkeley National Lab, Data Analysis and Visualization group, 2017.
10. Theory group seminar, UC Irvine, 2017.
11. AWM Research Symposium, Special Session on Applications of Topology and Geometry, UCLA 2017.
12. IBM Almaden Theory group, 2017.
13. International Workshop on Topological Data Analysis in Biomedicine (TDA-Bio), part of ACM BCB, 2016. **Keynote speaker.**
14. 48th Spring Topology and Dynamics Conference, Richmond, VA, 2014. **Plenary speaker.**
15. Workshop SIGMA at CIRM, Marseille, France, 2012. **Plenary speaker.**