

# Curriculum Vitae

**Tao Ju**

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Updated: January, 2018

## Academic appointments:

2016 - present Professor  
Department of Computer Science and Engineering  
Washington University in St. Louis

2010 - 2016 Associate Professor  
Department of Computer Science and Engineering  
Washington University in St. Louis

2005 - 2010 Assistant Professor  
Department of Computer Science and Engineering  
Washington University in St. Louis

Summer 2005 Post-Doctoral Fellow  
Department of Biochemistry and Molecular Biology  
Baylor College of Medicine, Houston, Texas

## Educational background:

May 2005 Rice University (Houston, Texas), Ph.D. in Computer Science

June 2000 Tsinghua University (Beijing, China), B.S. in Computer Science

June 1999 Tsinghua University (Beijing, China), B.A. in English Language

## Publications:

Peer-reviewed journal articles:

1. “Repairing Inconsistent Curve Networks on Non-parallel Cross-sections”, Z.-Y. Huang, M. Holloway, N. Carr, **T. Ju**, *Computer Graphics Forum*, accepted (2018).
2. “Topology-controlled Reconstruction of Multi-labelled Domains from Cross-sections”, Z.-Y. Huang, M. Zou, N. Carr, **T. Ju**, *ACM Transactions on Graphics*, Vol. 36, No. 4, Article No. 76 (2017).
3. “FlowRep: Descriptive Curve Networks for Free-Form Design Shapes”, G. Gori, A. Sheffer, N. Vining, E. Rosales, N. Carr, **T. Ju**, *ACM Transactions on Graphics*, Vol. 36, No. 4, Article No. 59 (2017).

4. "Feature-Aligned Segmentation using Correlation Clustering", Y.-X. Zhuang, H. Dou, N. Carr, **T. Ju**, *Computational Visual Media*, Vol. 3, No. 2, pp. 147-160 (2017).
5. "Extracting Sharp Features from RGB-D Images", Y.-P. Chao, **T. Ju**, J. Xu, S.-M. Hu, *Computer Graphics Forum*, Vol. 36, No. 8, pp. 138-152 (2017).
6. "Flexible Fitting of Atomic Models into Cryo-EM Density Maps Guided by Helix Correspondences", H. Dou, D. Burrows, M. Baker, **T. Ju**, *Biophysical Journal*, Vol. 112, No. 12, pp. 2479-2493 (2017).
7. "Erosion Thickness on Medial Axes of 3D Shapes", Y.-J. Yan, K. Sykes, E. Chambers, D. Letscher, **T. Ju**, *ACM Transactions on Graphics*, Vol. 35, No. 4, Article No. 38 (2016).
8. "Extrinsically Smooth Direction Fields", Z.-Y. Huang, **T. Ju**, *Computer & Graphics*, Vol. 58, pp. 109-117 (2016).
9. "Template-based Surface Reconstruction from Cross-sections", M. Holloway, C. Grimm, **T. Ju**, *Computer & Graphics*, Vol. 58, pp. 84-91 (2016).
10. "Fusing Heterogeneous Features from Stacked Sparse Autoencoder for Histopathological Image Analysis", X.-F. Zhang, H. Dou, **T. Ju**, J. Xu, S.-T. Zhang, *IEEE Journal Of Biomedical And Health Informatics*, Vol. 20, No. 5, pp. 1377-1383 (2016).
11. "Topology-Constrained Surface Reconstruction From Cross-sections", M. Zou, M. Holloway, N. Carr, **T. Ju**, *ACM Transactions on Graphics*, Vol. 34, No. 4, Article No. 128 (2015).
12. "Graph-based deformable matching of 3D line segments with application in protein fitting", H. Dou, M. Baker, **T. Ju**, *The Visual Computer*, Vol. 31, pp. 967-977 (2015).
13. "A Robust Parity Test for Extracting Parallel Vectors in 3D", **T. Ju**, M.-X. Cheng, X. Wang, Y. Duan, *IEEE Transactions on Visualization and Computer Graphics*, Vol. 20, No. 12, pp. 2526-2534 (2014) [**Best Paper Honorable Mentioning at IEEE Visualization'14**].
14. "Anisotropic geodesics for live-wire mesh segmentation", Y.-X. Zhuang, M. Zou, N. Carr, **T. Ju**, *Computer Graphics Forum*, Vol. 33, No. 7, pp. 111-120 (2014).
15. "Interactive Image-Guided Modeling of Extruded Shapes", Y.-P. Cao, **T. Ju**, Z. Fu, S.-M. Hu, *Computer Graphics Forum*, Vol. 33, No. 7, pp. 101-110 (2014) [**Best Paper at Pacific Graphics'14**].
16. "Middle cerebral artery bifurcation aneurysms: an anatomic classification scheme for planning optimal surgical strategies", C. Washington, **T. Ju**, G. Zipfel, R. Dacey, *Operative Neurosurgery*, Vol. 10, No. 1, pp. 145-155 (2014).
17. "Reliability of clinically relevant 3D foot bone angles from quantitative computed tomography", D. Gutekunst, L. Liu, **T. Ju**, F. Prior, D. Sinacore, *Journal of Foot and Ankle Research*, Vol. 6, No. 1, pp. 38 (2014).

18. "A general and efficient method for finding cycles in 3D curve networks", Y.-X. Zhuang, M. Zou, N. Carr, **T. Ju**, *ACM Transactions On Graphics*, Vol. 32, No. 6, Article No. 180 (2013).
19. "Cubic Mean Value Coordinates", X.-Y. Li, **T. Ju**, S.-M. Hu, *ACM Transactions On Graphics*, Vol. 32, No. 4, Article No. 126 (2013).
20. "An algorithm for triangulating multiple 3D polygons", M. Zou, **T. Ju**, N. Carr, *Computer Graphics Forum*, Vol. 32, No. 5, pp. 157-166 (2013).
21. "Feature correspondences using Morse Smale complex", W. Feng, J. Huang, **T. Ju**, H.-J. Bao, *The Visual Computer*, Vol. 29, No. 1, pp. 53-67 (2013).
22. "Does the gamma dose distribution comparison technique default to the distance to agreement test in clinical dose distributions?", D. Low, D. Morele, P. Chow, H.-T. Dou, **T. Ju**, *Medical Physics*, Vol. 40, No. 7, 071722 (2013).
23. "Automated, Foot-Bone Registration Using Subdivision-Embedded Atlases for Spatial Mapping of Bone Mineral Density", L. Liu, P.K. Commean, C. Hildebolt, D. Sinacore, F. Prior, J. P. Carson, I. Kakadiaris, **T. Ju**, *Journal of Digital Imaging*, Vol. 26, No. 9, pp. 554-562 (2013).
24. "Gorgon and pathwalking: Macromolecular modeling tools for subnanometer resolution density maps", M. L. baker, M. R. Baker, C. F. Hryc, **T. Ju**, W. Chiu, *Biopolymers*, Vol. 97, No. 9, pp. 655-668 (2012).
25. "Feature correspondences using Morse Smale complex", W. Feng, J. Huang, **T. Ju**, H-J Bao, *The Visual Computer*, Vol. 29, No. 1, pp. 53-67 (2012).
26. "Region-based Line Field Design Using Harmonic Functions", C.-Y. Yao, M.-T. Chi, T.-Y. Lee, **T. Ju**, *IEEE Transactions on Visualization and Computer Graphics*, Vol. 18, No. 6, pp. 902-913 (2012).
27. "View-independent Contour Culling of 3D Density Maps for Far-field Viewing of Iso-surfaces", P. Feng, **T. Ju**, J. Warren, *Computer and Graphics*, Vol. 35, No. 3, pp. 561-568 (2011).
28. "Extended Grassfire Transform on Medial Axes of 2D Shapes", L. Liu, E. Chambers, D. Letscher, **T. Ju**, *Computer Aided Design*, Vol. 43, No. 11, pp. 1496-1505 (2011).
29. "A Geometric Study of V-style Pop-ups: Theories and Algorithms", X.-Y. Li, **T. Ju**, Y. Gu, S.-M. Hu, *ACM Transactions on Graphics*, Vol. 30, No. 4, article 98 (2011).
30. "Modeling protein structure at near atomic resolutions with Gorgon", M. Baker, S. Abeysinghe, S. Schuh, R. Coleman, A. Abrams, M. Marsh, C. Hryc, T. Ruths, W. Chiu, **T. Ju**, *Journal of Structural Biology*, Vol. 174, No. 2, pp. 360-373 (2011).
31. "A semiautomated approach for artefact removal in serial tissue cryosections", L. Kindle, I. Kakadiaris, **T. Ju**, J. Carson, *Journal of Microscopy*, Vol. 231, No. 2, pp. 200-206 (2011).

32. "Volumetric Quantitative Computed Tomography Measurement Precision for Volumes and Densities of Tarsal and Metatarsal Bones", P. Commean, J. Kennedy, K. Bahow, C. Hildebolt, L. Liu, K. Smith, M. Hastings, **T. Ju**, F. Prior, D. Sinacore, *Journal of Clinical Densitometry*, Vol. 14, No. 3, pp. 313-320 (2011).
33. "Popup: Automatic Paper Architectures from 3D Models", X-Y. Li, C-H. Shen, S-S. Huang, **T. Ju**, S-M. Hu, *ACM Transactions On Graphics*, Vol. 29, No. 4, article 111 (2010).
34. "A simple and robust thinning algorithm on cell complexes", L. Liu, E. Chambers, D. Letscher, **T. Ju**, *Computer Graphics Forum*, Vol. 29, No. 7, pp. 2253-2260 (2010).
35. "Semi-isometric registration of line features for flexible fitting of protein structures", S. Abeysinghe, M. Baker, W. Chiu, **T. Ju**, *Computer Graphics Forum*, Vol. 29, No. 7, pp. 2243-2252 (2010).
36. "Instant Propagation of Sparse Edits on Images and Videos", Y. Li, **T. Ju**, S-M. Hu, *Computer Graphics Forum*, Vol. 29, No. 7, pp. 2049-2054 (2010).
37. "Automated pipeline for atlas-based annotation of gene expression patterns: Application to postnatal day 7 mouse brain", J. Carson, **T. Ju**, L. Liu, M. Bello, C. Thaller, J. Warren, I. Kakadiaris, W. Chiu, G. Eichele, *Methods*, Vol. 50, No. 2, pp. 85-95 (2010).
38. "Subdivision Meshes for Organizing Spatial Biomedical Data", **T. Ju**, J. Carson, L. Liu, J. Warren, M. Bello, I. Kakadiaris, *Methods*, Vol. 50, No. 2, pp. 70-76 (2010).
39. "Efficient affinity-based edit propagation using k-d tree", K. Xu, **T. Ju**, Y. Li, S-M. Hu, *ACM Transactions On Graphics*, Vol. 28, No. 5, article 118 (2009).
40. "Feature-Aligned Shape Texturing", K. Xu, D. Cohen-Or, **T. Ju**, L. Liu, H. Zhang, S-Z. Zhou, Y-S. Xiong, *ACM Transactions On Graphics*, Vol. 28, No. 5, article 108 (2009).
41. "Tarsal and Metatarsal Bone Mineral Density Measurement using Volumetric Quantitative Computed Tomography", P. K. Commean, **T. Ju**, L. Liu, D. R. Sinacore, M. K. Hastings, M. J. Mueller, *Journal of Digital Imaging*, Vol. 22, No. 5, pp. 492-502 (2009).
42. "Compatible quadrangulation by sketching", C.-Y. Yao, H.-K. Chu, **T. Ju**, T.-Y. Lee, *Computer Animation And Virtual Worlds*, Vol. 23, No. 2-3, pp. 101-109 (2009).
43. "Interactive skeletonization of intensity volumes", S. Abeysinghe, **T. Ju**, *The Visual Computer*, Vol. 25, No. 5-7, pp. 627-635 (2009).
44. "Adaptive Smooth Surface Fitting with Manifolds", C. Grimm, L. Phan, **T. Ju**, J. Hughes, *The Visual Computer*, Vol. 25, No. 5-7, pp. 589-597 (2009).
45. "Fixing errors on polygonal models: A survey", **T. Ju**, *Journal of Computer Science and Technology*, Vol. 24, No. 1, pp. 19-29 (2009).

46. "Reusable Skinning Templates Using Cage-based Deformations", **T. Ju**, Q-Y. Zhou, M. van de Panne, D. Cohen-or, U. Neumann, *ACM Transactions on Graphics*, Vol. 27, No. 5, pp. 122 (2008).
47. "Shape modeling and matching in identifying 3D protein structures", S. Abeysinghe, **T. Ju**, M. Baker, W. Chiu, *Computer Aided-Design*, Vol. 40, pp. 708-720 (2008).
48. "Geometric interpretation of the Gamma dose distribution comparison technique: interpolation-free calculation", **T. Ju**, T. Simpson, J.O. Deasy, and D.A. Low, *Medical Physics*, Vol. 35, No. 3, pp. 879-887 (2008).
49. "Surface reconstruction from non-parallel curve networks", L. Liu, C. Bajaj, J.O. Deasy, D.A. Low, and **T. Ju**, *Computer Graphics Forum*, Vol. 27, No. 2, pp. 155-163 (2008).
50. "Real-time homogenous translucent material editing", K. Xu, Y. Gao, Y. Li, **T. Ju**, and S-M. Hu, *Computer Graphics Forum*, Vol. 26, No. 3, pp. 545-552, (2007).
51. "Editing The Topology of 3D Models by Sketching", **T. Ju**, Q-Y. Zhou, and S-M. Hu, *ACM Transactions on Graphics*, Vol. 26, No. 3, pp. 42-50, (2007).
52. "Computing a family of skeletons of volumetric models for shape description", **T. Ju**, M. Baker, and W. Chiu, *Computer-Aided Design*, Vol. 39, No. 5, pp. 352-360, (2007).
53. "Learning-based Segmentation Framework for Tissue Images Containing Gene Expression Data", M. Bello, **T. Ju**, J. Carson, J. Warren, W. Chiu, I.A. Kakadiaris, *IEEE Transaction on Medical Imaging*, Vol. 26, No. 5, pp. 728-744, (2007).
54. "Topology Repair of Solid Models Using Skeletons", Q-Y. Zhou, **T. Ju** and S-M Hu, *IEEE Transaction on Visualization and Computer Graphics*, Vol. 13, No. 4, pp. 675-685, (2007).
55. "A general geometric construction of coordinates in a convex simplicial polytope", **T. Ju**, P. Liepa and J. Warren, *Computer-Aided Geometric Design*, Vol. 24, No. 3, pp. 161-178, (2007).
56. "Manifold Dual Contouring", S. Schaefer, **T. Ju** and J. Warren, *IEEE Transaction on Visualization and Computer Graphics*, Vol. 13, No. 3, pp. 610-619, (2007).
57. "Identification of Secondary Structure Elements in Intermediate Resolution Density Maps", M. Baker, **T. Ju**, and W. Chiu, *Structure*, Vol. 15, No. 1, pp. 7-19, (2007).
58. "A Unified, Integral Construction For Coordinates Over Closed Curves", S. Schaefer, **T. Ju** and J. Warren, *Computer-Aided Geometric Design*, Vol. 24, No. 8-9, pp. 481-493, (2007).
59. "Probing 3'-ssDNA Loop Formation in E. coli RecBCD/RecBC-DNA Complexes using Non-natural DNA: A Model for "Chi" Recognition Complexes", C. J. Wong, R. L. Rice, N. A. Baker, **T. Ju** and T. M. Lohman, *Journal of Molecular Biology*, Vol. 362, No. 1, pp. 26-43, (2006).

60. “3D Volume Reconstruction of a Mouse Brain from Histological Sections using Warp Filtering”, **T. Ju**, J. Warren, J. Carson, I. Kakadiaris, M. Bello, C. Thaller, G. Eichele, *Journal of Neuroscience Methods*, Vol. 156, No. 1-2, pp. 84-100, (2006).
61. “Building 3D surface networks from 2D curve networks with application to anatomical modeling”, **T. Ju**, J. Warren, J. Carson, G. Eichele, C. Thaller, W. Chiu, M. Bello and I. Kakadiaris *The Visual Computer*, Vol. 21, No. 8-10, pp. 764-773, (2005).
62. “A Digital Atlas to Characterize the Mouse Brain Transcriptome”, J. Carson, **T. Ju**, H. Lu, C. Thaller, M. Xu, S. Pallas, M. C. Crair, J. Warren, W. Chiu and G. Eichele *PLoS Computational Biology*, Vol. 1, No. 4, pp. e41, (2005).
63. “Mean value coordinates for closed triangular meshes”, **T. Ju**, S. Schaefer and J. Warren *ACM Transactions on Graphics*, Vol. 24, No. 3, pp. 561-566, (2005).
64. “Robust Repair of Polygonal Models”, **T. Ju**, *ACM Transactions on Graphics*, Vol. 23, No. 3, pp. 888-895, (2004).
65. “Turtle geometry in computer graphics and computer aided design”, R. Goldman, S. Schaefer and **T. Ju**, *Computer-aided Design*, Vol. 36, No. 14, pp. 1471-1482, (2004).
66. “Recursive Turtle Programs and Iterated Affine Transformations”, **T. Ju**, S. Schaefer and R. Goldman, *Computer and Graphics*, Vol. 28, No. 6, pp. 991-1004, (2004).
67. “Convex contouring of volumetric data”, **T. Ju**, S. S chaefer and J. Warren, *The Visual Computer*, Vol. 19, pp. 513-525, (2003).
68. “Dual contouring of Hermite data”, **T. Ju**, F. Losasso, S. Schaefer and J. Warren, *ACM Transactions on Graphics*, Vol. 21, No. 3, pp. 339-346, (2002).
69. “Modifying the shape of NURBS surfaces with geometric constraints”, S.M. Hu, Y.F. Li, **T. Ju** and X. Zhu, *Computer-aided Design*, Vol. 33, No. 12, pp. 903-912, (2001).
70. “Approximate merging of A pair of Bezier curves”, S.M. Hu, R.F. Tong, **T. Ju** and S.J. Guang, *Computer-aided Design*, Vol. 33, No. 2, pp. 125-136, (2001).

Refereed conference articles:

1. “Fusing Heterogeneous Features for the Image-Guided Diagnosis of Intraductal Breast Lesions”, X-F. Zhang, H. Dou, **T. Ju**, S-T. Zhang, in *Proceedings of IEEE International Symposium on Biomedical Imaging (ISBI'15)* (**Oral presentation**), New York (2015).
2. “Computer-Assisted Shape Classification of Middle Cerebral Artery Aneurysms for Surgical Planning”, D. Burrows, C. Washington, R. Dacey, **T. Ju**, in *Proceedings of IEEE International Symposium on Biomedical Imaging (ISBI'14)*, Beijing, China (2014).
3. “An algorithm for suggesting delineation planes for interactive segmentation”, S. Yifrah, E. Zadicario, **T. Ju**, D. Cohen-Or, in *Proceedings of IEEE International Symposium on Biomedical Imaging (ISBI'14)*, Beijing, China (2014).

4. "Inlier Detection in Thermal Sensitive Images", E. Zadicario, N. Carmi, **T. Ju**, D. Cohen-Or, in *Proceedings of Eurographics Workshop on Visual Computing for Biology and Medicine (VCBM'14)*, Vienna, Austria (2014).
5. "Medial Residues of Piecewise Linear Manifolds", E. W. Chambers, **T. Ju**, D. Letscher, in *Proceedings of Canadian Conference on Computational Geometry (CCCG'13)*, Waterloo, Canada (2013).
6. "Similarity-Based Appearance-Prior for Fitting a Subdivision Mesh in Gene Expression Images", Y.-H. Le, U. Kurkure, N. Paragios, **T. Ju**, J. P. Carson, I. A. Kakadiaris, in *Proceedings of MICCAI*, Nice, France, pp. 577-584 (2012).
7. "Isotopic Frechet Distance", E. Chambers, **T. Ju**, D. Letscher, L. Liu, in *Canadian Conference on Computational Geometry (CCCG'11)*, Toronto, Canada, accepted (2011).
8. "Subdivision-based Deformable Model for Geometric Atlas Fitting", U. Kurkure, Y. H. Le, N. Paragios, **T. Ju**, J. Carson, I. A. Kakadiaris, in *IEEE International Conference on Computer Vision (ICCV'11)*, Barcelona, Spain, accepted (2011).
9. "Landmark/Image-based Deformable Registration of Gene Expression Data", U. Kurkure, Y.-H. Le, N. Paragios, J. Carson, **T. Ju**, I. Kakadiaris, in *IEEE Computer Vision and Pattern Recognition (CVPR'11)*, Colorado Springs, pp. 1089-1096 (2011).
10. "Polygonizing Extremal Surfaces with Manifold Guarantees", R.-S. Li, L. Liu, L. Phan, S. Abeyasinghe, C. Grimm, **T. Ju**, in *Proceedings of Symposium of Solid and Physical Modeling (SPM)*, Haifa, Israel, pp. 189-194 (2010).
11. "Piecewise Tri-linear Contouring for Multi-Material Volumes", P. Feng, **T. Ju**, J. Warren, in *Proceedings of Geometry Modeling and Processing (GMP)*, Castro Urdiales, Spain, pp. 43-56 (2010).
12. "VolumeViewer: An Interactive Tool for Fitting Surfaces to Volume Data", R. Sowell, L. Liu, **T. Ju**, C. Grimm, C. Abraham, G. Gokhroo, D. Low, in *Proceedings of Sixth Eurographics Workshop on Sketch Based Interfaces and Modeling (SBIM)*, New Orleans, pp. 141-148 (2009).
13. "Interactive Separation of Segmented Bones in CT Volumes Using Graph Cut ", L. Liu, D. Raber, D. Nopachai, P. Commean, D. Sinacore, F. Prior, R. Pless, **T. Ju**, in *Proceedings of MICCAI*, New York, Vol. 5241, pp. 296-304 (2008).
14. "Segmentation-free skeletonization of grayscale volumes for shape understanding", S. Abeyasinghe, M. Baker, W. Chiu, **T. Ju**, in *Proceedings of IEEE International Conference on Shape Modeling and Applications*, New York, pp. 63-71 (2008).
15. "Active and passive responses of myofibroblasts in response to mechanical stretching in 3D culture", A.C. Nathan, S.-L. Lee, J.P. Marquez, **T. Ju**, K.M. Pryse, E.L. Elson, G. M. Genin, in *Proceedings of the ASME 2008 Summer Bioengineering Conference (SBC2008)*, Marco Island, Florida (2008).

16. "Developing a Biomarker for Neuropathic Arthropathy in Diabetic Patients", F. Prior, P.K. Commean, **T. Ju**, M. Hastings, C. Hildebolt, D.R. Sinacore, in *Proceedings of IEEE/NIH Life Science Systems and Applications Workshop*, Bethesda, Maryland, pp. 13-16 (2007).
17. "Shape modeling and matching in identifying protein structure from low-resolution images", S. Abeysinghe, **T. Ju**, M. Baker, W. Chiu, in *Proceedings of ACM Symposium on Solid and Physical Modeling*, Beijing, China, pp. 223-232 (2007).
18. "Intersection-free Contouring on An Octree Grid", **T. Ju** and T. Udeshi, in *Proceedings of Pacific Graphics*, Taipei, Taiwan (2006).
19. "Computing a family of skeletons of volumetric models for shape description", **T. Ju**, M. Baker, and W. Chiu, in *Proceedings of Geometric Modeling and Processing (GMP06)*, Pittsburgh, pp. 235-247 (2006).
20. "Hybrid Segmentation Framework for Tissue Images Containing Gene Expression Data", M. Bello, **T. Ju**, J. Warren, J. Carson, W. Chiu, C. Thaller, G. Eichele and I. Kakadiaris, in *Proceedings of Eighth International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI2005)*, Palm Springs, California, pp. 254-261 (2005).
21. "Geometric Construction of Coordinates for Convex Polyhedra using Polar Duals", **T. Ju**, S. Schaefer, J. Warren and M.Desbrun, in *Proceedings of Eurographics Symposium on Geometry Processing*, Nice, France, pp. 181-186 (2005).
22. "Automated Characterization of Gene Expression Patterns with an Atlas of the Mouse Brain", J. P. Carson, **T. Ju**, C. Thaller, J. Warren, M. Bello, I. Kakadiaris, W. Chiu and G. Eichele, in *Proceedings of The 26th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBS2004)*, San Francisco, California, pp. 2917-2920 (2004).
23. "Landmark-driven, Atlas-based Segmentation of Mouse Brain Tissue Slices Containing Gene Expression Data", I. Kakadiaris, M. Bello, S. Arunachalam, W. Kang, **T. Ju**, J. Warren, J. Carson, W. Chiu, C. Thaller and G. Eichele, in *Proceedings of Seventh International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI2004)*, Saint Malo, France, pp. 192-199 (2004).
24. "Hodograph Turtles", **T. Ju** and R. Goldman, in *Proceedings of the 7th IASTED International Conference on Computer Graphics and Imaging*, Kuwai, Hawaii (2004).
25. "A geometry database for gene expression data", **T. Ju**, J. Warren, G. Eichele, C. Thaller, W. Chiu and J. Carson, in *Proceedings of Eurographics Symposium on Geometry Processing*, Aachen, Germany, pp. 166-176 (2003).
26. "Morphing of rational b-spline curves and surfaces using mass distributions", **T. Ju** and R. Goldman, in *Proceedings of Eurographics 2003 (short papers)*, Granada, Spain (2003).

Book chapters:



1. “Scattered data interpolation”, **T. Ju**, in “A Sampler of Useful Computational Tools for Applied Geometry”, Daniel Cohen-Or (editor), 2015.

#### **Keynote speeches:**

1. “Topology-aware modeling from curves”, *Geometric Modeling and Processing (GMP'16)*, San Antonio, April 2016.
2. “Geometric tools for knowledge discovery from bio-medical images”, *International Symposium on Visual Computing (ISVC'09)*, Las Vegas, November 2009.
3. “Octree skeletons: towards efficient and robust shape and topology analysis”, *IEEE International Conference on Shape Modeling and Applications (SMI'08)*, New York, June 2008.

#### **Invited talks at conferences:**

1. “Erosion Thickness on the medial axes of 3D shapes”, Workshop talk, *Symposium on Computational Geometry*, Brisbane, Australia (July 2017).
2. “Protein Modeling from Intermediate-Resolution Density Maps Using Geometric Skeletons”, invited seminar, *SIAM Conference on the Life Sciences*, Charlotte, North Carolina (August 2014).
3. “Surface reconstruction from cross-section curves”, invited seminar, *Workshop on City Modeling, Simulation and Visualization*, Shenzhen, China, (December 2008).
4. “Deciphering Protein Structures from Cryo-EM: a geometric approach”, invited symposium talk, *Bio-geometry Symposium at IEEE International Conference on Shape Modeling and Applications (SMI 2008)*, New York, (June 2008).
5. “Surface reconstruction from cross-section curves”, invited seminar, *Dagstuhl Seminars on Geometric Modeling*, Dagstuhl, Germany, (May 2008).
6. “A general geometric construction of coordinates in any dimensions”, invited symposium talk, *Tenth SIAM Conference on Geometric Design and Computing*, San Antonio, Texas, (November 2007).
7. “A general geometric construction of coordinates in a convex simplicial polytope”, invited seminar, *Eurographics IPC Minisymposium*, Prague, Czech Republic (April 2007).

#### **Invited talks at academic institutes:**

1. “Topology-aware modeling from curves”, Department colloquium, UMSL, St. Louis (October 2017).
2. “Topology-aware modeling from curves”, Invited seminar, Shandong University, Jinan, China (June 2017).

3. “Erosion Thickness on the medial axes of 3D shapes”, Invited talk, Adobe Research, San Jose (March 2017).
4. “Geometric skeletons for shape analysis”, Invited seminar, Physical Therapy and Orthopedic Surgery, Washington University School of Medicine (March 2017).
5. “Protein modeling from cryo-EM using geometric skeletons”, Biophysical evening seminar, Washington University in St. Louis (December 2016).
6. “Topology-aware modeling from curves”, Department of Computer Science, Wayne State University (October 2016).
7. “A Robust Parity Test for Extracting Parallel Vectors in 3D”, Department of Computer Science, University of Texas at Austin (March 2015).
8. “Protein Modeling from Intermediate-Resolution Density Maps Using Geometric Skeletons”, Department of Computer Science, University of North Carolina at Charlotte (August 2014).
9. “Finding cycles in 3D curve networks”, Department of Computer Science, Tsinghua University (December 2013).
10. “Geometric algorithms for structural biology”, Department of Computer Science, University of Missouri - Columbia (February 2011).
11. “Geometric algorithms for structural biology”, Department of Computer Science, Rutgers (State University of New Jersey), New Jersey (October 2010).
12. “Geometric algorithms for structural biology”, Department of Computer Science, Nanjing University, Nanjing, China (June 2010).
13. “Geometric tools for knowledge discovery from bio-medical images”, Department of Mathematics and Computer Science, University of Missouri at St. Louis (November 2009).
14. “Geometric tools for bio-medical image analysis”, Department of Biology, Washington University in St. Louis (September 2009).
15. “Cage-based shape deformation and animation” (Distinguished Lecture), School of Computing, University of Utah (March 2009).
16. “Geometric tools for bio-medical image analysis”, School of Computing, University of Utah (October 2008).
17. “Geometric tools in bio-medical image analysis”, Indiana University School of Medicine (September 2008).
18. “Geometric Databases for Organizing Medical Images” (Imaging Science and Engineering Seminars), Washington University in St. Louis, (November 2006).

19. “Building skeletons for shape and topology analysis of 3D models”, University of Hong Kong; Hong Kong University of Science and Technology (October 2006).
20. “Building skeletons for shape and topology analysis of 3D models”, University of Houston; University of Missouri at Columbia; Peking University, (June 2006).
21. “Geometric Approaches in Biomedical Image Analysis”, Dept. of Radiology Oncology, Washington University School of Medicine, (June 2006).
22. “A Geometric Database For Gene Expressions Over The Mouse Brain”, Mallinckrodt Institute of Radiology, Washington University School of Medicine, (June 2006).
23. “Dual Methods in Mesh Processing with Applications in Computational Biology”, Department of Computer Science, University of Texas in Austin, (March 2006).
24. “Building Skeletons for Analyzing 3D Cryo-EM Protein Structures at Intermediate Resolutions”, Center for Computational Biology Seminars, Washington University School of Medicine, (October 2005).
25. “A Spatial Database of Gene Expression Patterns for the Mouse Brain”, CIIT Centers for Health Research, Raleigh-Durham, North Carolina, (April 2004).

#### **Software and tools:**

1. *Gorgon* (2008 - present): An interactive molecular modeling system for cryo-EM and other low resolution imageries of macromolecular complexes. Collaboratively developed with Baylor College of Medicine and freely available (maintained by PhD student S. Abeysinghe).  
<http://gorgon.wustl.edu>  
<https://github.com/GorgonCryoEM/Gorgon/wiki>  
 (Google: “Gorgon”)
2. *Boneatlas* (2009 - present): A graphical tool for performing various analysis of human foot bones reconstructed from CT images, such as bone dimensions, inter-bone angles, and regional bone mineral densities. Routinely used for clinical research at Mallinckrodt Institute of Radiology and Program in Physical Therapy at the Washington University School of Medicine. (maintained by PhD student L. Liu).
3. *Ctr2suf* (2008): A program for 3D surface reconstruction from 2D planar curves on parallel or non-parallel cross-section planes. Freely available (maintained by PhD student L. Liu).  
<http://www.cse.wustl.edu/~l1110/paper/ctr2suf/program.html> (Google: “Ctr2suf”)
4. *Boneseg* (2008): An interactive tool for segmenting individual bones from CT scans. Routinely used at the Electronic Radiology Lab led by Dr. Fred Prior at Mallinckrodt Institute of Radiology in Washington University Medical School. (maintained by PhD student L. Liu).

5. *Stackaligner* (2007): A graphical toolkit for reconstructing smooth 3D volumes from serially sectioned tissue images. Freely available.  
<http://www.cse.wustl.edu/~taoju/code/stackaligner.htm> (Google: "Stackaligner")
  
6. *Polymender* (2004): A robust, efficient program for removing cracks, holes, T-junctions and self-intersections from arbitrary polygonal models. Freely available.  
<http://www.cse.wustl.edu/~taoju/code/polymender.htm> (Google: "Polymender")
  
7. *Geneatlas.org* (2003): A web-based spatial database of gene expression patterns in the mouse brain featuring fully-customized graphical query interface. Collaboratively developed with Rice University, Baylor College of Medicine, University of Houston, Pacific Northwest National Lab.  
<http://www.geneatlas.org>

**Teaching:**

Semester	Course Description	Level	Enrollment (U/G)
2017 FL	CSE546 (Computational Geometry)	G	24/12
2016 FL	CSE554 (Geometric Computing for Biomedicine)	G	4/5
2015 FL	CSE554 (Geometric Computing for Biomedicine)	G	2/23
2015 SP	CSE452 (Compute Graphics)	U	37/7
2014 FL	CSE554 (Geometric Computing for Biomedicine)	G	8/17
2014 SP	CSE546 (Computational Geometry)	G	20/29
2013 FL	CSE554 (Geometric Computing for Biomedicine)	G	10/17
2013 SP	CSE452 (Compute Graphics)	U	29/13
2012 FL	CSE554 (Geometric Computing for Biomedicine)	G	4/8
2011 FL	CSE554 (Geometric Computing for Biomedicine)	G	6/7
2011 SP	CSE452 (Compute Graphics)	U	16/6
2010 FL	CSE554 (Geometric Computing for Biomedicine)	G	5/9
2010 SP	CSE452 (Compute Graphics)	U	27/6
2009 FL	CSE330 (Rapid Prototyping)	U	30/0
2009 SP	CSE452 (Compute Graphics)	U	23/7
	CSE451 (Game Programming II), with C. Kelleher	U	9/2
2008 FL	CSE450 (Game Programming I), with C. Kelleher	U	7/3
2008 SP	CSE452 (Compute Graphics)	U	17/1
	CSE451 (Game Programming II)	U	7/7
2007 FL	CSE450 (Game Programming I)	U	8/8
2007 SP	CSE452 (Compute Graphics)	U	11/6
2006 FL	CSE452 (Compute Graphics)	U	9/15
2006 SP	CSE451 (Game Programming II)	U	6/3
2005 FL	CSE450 (Game Programming I)	U	9/7

(All courses in the list are on-going, and I am the sole instructor unless noted otherwise)

### Students:

Graduate students supervised:

Sasakthi Abeysinghe (M.Sc., 2008; Ph.D, 2010; now at Google), sole advisor

Lu Liu (M.Sc., 2009; Ph.D, 2011; now at Google), sole advisor

Ming Zou (M.Sc., 2013; Ph.D, 2016; now at Waymo), sole advisor

Michelle Holloway (Ph.D, 2016; now at Partek Inc.), co-advised with C. Grimm

Hang Dou (Ph.D, 2017; now at Nvidia), sole advisor

Yajie Yan (Ph.D, expected 2018), sole advisor

Zhiyang Huang (Ph.D, expected 2019), sole advisor

Hang Yan (Ph.D, expected 2019), co-advisor with Y. Furukawa  
Chen Liu (Ph.D, expected 2019), co-advisor with Y. Furukawa  
Huayi Zeng (Ph.D, expected 2021), co-advisor with Y. Furukawa  
Dan Zeng (Ph.D, expected 2022), sole advisor

Timothy Simpson (M.Sc., 2008), sole advisor  
Trung Nguyen (M.Sc., 2011), sole advisor  
Steve Schuh (M.Sc., 2011), co-advised with R. Pless  
Ruosi Li (M.Sc., 2011), co-advised with C. Grimm  
Don McCurdy (M.Sc., 2012), sole advisor  
Adam Steffen (M.Sc., 2013), sole advisor  
Derek Burrows (M.Sc., 2013), sole advisor  
Jonathan Liang (M.Sc., 2014), sole advisor

Services on Doctoral dissertation committees:

Missael Garcia (CSE, 2017)  
Kyle Harms (CSE, 2017)  
Christopher Schlosberg (DBBS, 2017)  
Kyle Sykes (St. Louis University, 2016)  
Ian Schillebeeckx (CSE, 2016)  
Hongtao Sun (CSE, 2015)  
Austin Abrams (CSE, 2014)  
Lin Ma (CSE, 2014)  
Jing Xia (CSE, 2014)  
Binh Le (University of Houston, 2014)  
Yen Le Hai (University of Houston, 2014)  
Dandan Hu (Physics, 2013)  
Jacob Laughner (BME, 2013)  
Minmin Chen (CSE, 2013)  
Ly Phan (CSE, 2013)  
Ross Sowell (CSE, 2012)  
Manfred Georg (CSE, 2010)  
Ken Borelli (Biomedical Engineering, 2009)  
Dan Kuster (Biomedical Engineering, 2009)  
Shuli Wang (Electrical and System Engineering, 2009)  
Xuefeng Zhou (CSE, 2009)  
Monika Ray (CSE, 2009)

Yanni Sun (CSE, 2008)  
Vanessa Clark (CSE, 2008)  
Li Ma (Olin Business School, 2008)  
Qilong Zhang (CSE, 2007)  
Hui Zhang (CSE, 2007)  
Richard Souvenir (CSE, 2006)  
Jamie Payton (CSE, 2006)  
Timothy Gatzke (CSE, 2006)

Services on Master thesis committees:

Dingwen Li (CSE, 2016)  
Josha Little (CSE, 2016)  
Aaron Zemach (CSE, 2014)  
CJ Carey (CSE, 2011)  
Rachel Tannenbaum (CSE, 2009)  
Richard Speyer (CSE, 2009)  
Joe Izraelevitz (CSE, 2009)  
Raquel A. Bujans (CSE, 2006)  
Nisha Sudarsanam (CSE, 2006)  
Motoi Namihira (CSE, 2006)

**Research Funding:**

1. Agency: National Science Foundation (NSF RI-1618685)  
Title: RI: Small: Functional object modeling  
Role: **Principal investigator**  
Duration: 06/01/2016-05/31/2019  
Amount: \$440,000 (total), \$291,967 (total direct)
2. Agency: National Science Foundation (NSF DBI-1356388)  
Title: Collaborative re-search: ABI Innovation: Algorithms and tools for modeling macromolecular assemblies  
Role: **Principal investigator**  
Duration: 07/01/2014-06/30/2017  
Amount: \$234,668 (total), \$154,387 (total direct)
3. Agency: National Science Foundation (NSF IIS-1319573)  
Title: CGV: Small: Collaborative Research: Theories, algorithms, and applications of medial forms for shape analysis  
Role: **Principal investigator**  
Duration: 09/01/2013-08/31/2016

Amount: \$242,020 (total), \$159,223 (total direct)

4. Agency: National Science Foundation (NSF IIS-1302200)  
Title: CGV: Medium: Collaborative Research: Developing conceptual models for navigation, marking, and inspection in the context of 3D image segmentation  
Role: **Principal investigator**  
Duration: 06/15/2013-05/31/2016  
Amount: \$232,680 (total), \$153,079 (total direct)
5. Agency: National Science Foundation (NSF IIS-0846072)  
Title: CAREER: Reconstructing Geometrically and Topologically Correct Models  
Role: **Principal investigator**  
Duration: 09/01/2009-08/30/2014  
Amount: \$476,564 (total), \$313,529 (total direct)
6. Agency: National Science Foundation (NSF DBI-0743691)  
Title: Building Geometric Databases for Anatomy-Based Spatial Queries  
Role: **Principal investigator**  
Duration: 07/01/2008-06/30/2011 (extended to 2012)  
Amount: \$780,976 (total), \$661,674 (total direct)
7. Agency: National Science Foundation (NSF CCF-0702662)  
Title: Geometric Modeling for Spatial Analysis of Bio-Medical Data  
Role: **Principal investigator**  
Duration: 09/01/2007-08/31/2010 (extended to 2011)  
Amount: \$300,000 (total), \$198,468 (total direct)
8. Agency: National Science Foundation (NSF IIS-0705538)  
Title: III-CXT: Collaborative Research: Integrated Modeling of Biological Nanomachines  
Role: **Principal investigator**  
Duration: 08/01/2007-07/31/2009 (extended to 2010)  
Amount: \$165,000 (total), \$108,229 (total direct)
9. Agency: National Institutes of Health (NIH 1R01GM10881101A1)  
Title: Modeling DNA methylation's role on gene regulation  
Role: **Co-investigator** (PI: Dr. John Edwards)  
Duration: 08/01/2014-04/30/2019  
Amount (available to Ju): \$39,929 (total), \$26,183 (total direct)
10. Agency: Siteman Cancer Center (2014 Research Development Award in Breast Cancer)  
Title: Margin Analysis of Breast Cancer Specimens using Photoacoustical Imaging  
Role: **Co-investigator** (PI: Dr. Rebecca Aft)  
Duration: 04/01/2014-03/31/2015  
Amount (available to Ju): \$9,076 (total direct)



11. Agency: National Institutes of Health (NIH R21NS058553)  
 Title: An Interactive Volumetric Atlas of the Mouse Brain  
 Role: **Co-investigator** (PI: Dr. James Carson)  
 Duration: 03/01/2009-02/28/2011 (extended to November 2011)  
 Amount (available to Ju): \$122,493 (total), \$81,236 (total direct)
12. Agency: National Institutes of Health (NIH R21DK79457)  
 Title: Biomarkers for Charcot Arthropathy in Diabetic Patients  
 Role: **Co-investigator** (PI: Dr. Fred Prior)  
 Duration: 08/01/2007-07/31/2010 (extended to May 2011)  
 Amount (available to Ju): \$171,491 (total), \$112,960 (total direct)

### Professional services:

Conference chairing and organization:

1. Program co-chair: Geometric modeling and processing (2019), Symposium on Geometry Processing (2018), Pacific Graphics (2007), International Symposium on Visual Computing (computer graphics area) (2007).
2. Organizer: Workshop on Medial Axes at Symposium on Computational Geometry (2017), Midgraph Workshop (2008), International Symposium on Visual Computing (special track) (2006).
3. Session chair: ACM SIGGRAPH Asia (2008, 2013), SIGGRAPH (2010).

Program committees:

1. ACM SIGGRAPH.
2. ACM SIGGRAPH Asia.
3. Eurographics.
4. Eurographics Symposium on Geometry Processing.
5. Pacific Graphics .
6. ACM Symposium on Solid and Physical Modeling.
7. Geometric Modeling and Processing .
8. IEEE International Conference on Shape Modeling and Applications.
9. Sketch-Based Interfaces and Modeling.
10. International Symposium on Visual Computing.
11. Computer Graphics International Conference.
12. Computational Visual Media Conference.

Editorships:

1. Associate editor, *Transactions on Visualization and Computer Graphics*, IEEE (2015-present)

2. Associate editor, *Computational Visual Media*, Springer (2015-present)
3. Associate editor, *Computer Aided Design*, Elsevier (2012-present)
4. Associate editor, *Graphical Models*, Elsevier (2010-present)
5. Associate editor, *Computer Graphics Forum*, Wiley and Sons (2011-2014)
6. Guest editor, *Computer Aided Geometric Design (Special Issue on Pacific Graphics 2007)*, Volume 25, Issue 8 (8 papers), Elsevier (November 2008)
7. Guest editor, *Proceedings of The 15th Pacific Conference on Computer Graphics and Applications (Pacific Graphics 2007)*, IEEE Computer Society (November 2007)

Reviewing activities:

Proposals:

1. NSF
2. NIH
3. Louisiana Board of Regents' Research Competitiveness program
4. Nanyang Technological University (Singapore) research program
5. Israel Science Foundation
6. Swiss National Science Foundation

Journals (computer graphics):

1. ACM Transactions On Graphics
2. IEEE Transactions on Visualization and Computer Graphics
3. Computer-Aided Design
4. Computer-Aided Geometric Design
5. Computer and Graphics
6. Computer Graphics Forums
7. Graphics Models
8. The Visual Computer
9. IEEE Computer Graphics and Applications
10. ACM Transactions on Spatial Algorithms and Systems
11. International Journal of Computational Geometry and Applications
12. IEEE Transactions on Pattern Analysis and Machine Intelligence
13. Computer Vision and Image Understanding
14. Pattern Recognition
15. Pattern Recognition Letters
16. Image and Vision Computing

Journals (bio-medicine):

1. Cell

2. Cerebral Cortex
3. IEEE/ACM Transactions on Computational Biology and Bioinformatics
4. IEEE Transactions on Medical Imaging
5. Journal of Digital Imaging
6. BMC Developmental Biology
7. Computer Methods in Biomechanics and Biomedical Engineering
8. Frontiers in Neuroinformatics
9. Biopolymers

Journals (general):

1. ACM Computing Surveys
2. Computing
3. Computers and Mathematics with Applications
4. Journal of Robotics and Computer Integrated Manufacturing
5. IEEE Transactions on Automation Science and Engineering
6. Journal of Computing and Information Science in Engineering
7. Journal of Computer Science and Technology
8. Journal of Computational Physics
9. Engineering with Computers

Conferences (computer graphics):

1. ACM SIGGRAPH (papers, courses, general submissions)
2. ACM SIGGRAPH ASIA (papers, courses)
3. Eurographics
4. Symposium on Geometry Processing
5. IEEE Visualization
6. IEEE Virtual Reality
7. EuroVis
8. Pacific Graphics
9. ACM Symposium on Solid and Physical Modeling (SPM)
10. IEEE International Conference on Shape Modeling and Applications (SMI)
11. Geometric Modeling and Processing (GMP)
12. Computer Graphics International (CGI)
13. International Symposium on Visual Computing
14. Sketch-based Interfaces and Modeling (SBIM)

Conferences (bio-medicine):

1. MICCAI

2. European Conference on Mathematical and Theoretical Biology
3. International Symposium on Biomedical Imaging

**University services:**

1. Vice Dean of Research, School of Engineering and Applied Science (2016-present)
2. Ambassador, McDonnell International Scholar Academy (2013-present)
3. Director of multi-disciplinary studies (2010-2016)
4. Faculty advisor of Washington University ACM Chapter (2010-2016)
5. Coordinator of CSE technical report system (2008-2016)
6. Undergraduate Board of School of Engineering and Applied Science (2006-2016)
7. Faculty Search Committee (2006,2012,2016)