

# Curriculum Vita – Eugene Zhang

## A. Education and Employment Information

### A1. Education

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2004	PhD, Computer Science Georgia Institute of Technology Advisor: Greg Turk
1995	MS, Computer Science Ohio State University
1994	MS, Mathematics Ohio State University

### A2. Professional Experience

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Sep 2018-present	Professor School of Electrical Engineering and Computer Science Oregon State University
Mar 2012-Jul 2012	Guest Professor Max-Planck Institute – Informatics
Aug 2011-Feb 2012	Guest Professor Berlin Mathematical School
Sep 2010-Aug 2018	Associate Professor School of Electrical Engineering and Computer Science Oregon State University
Sep 2004-Aug 2010	Assistant Professor School of Electrical Engineering and Computer Science Oregon State University
Jun 1995-Aug 1999	Software Developer and Team Leader Datastream Systems, Inc.

## B. Teaching, Advising, and Other Assignments

### B1. Instructional Summary

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#### B1.1. Credit Courses

Number	Course Title	Term/Year	Credits	Enrollment
CS419/519	Special Topics: Geometric Modeling	Winter 2005	4	24
CS275	Intro. to Database Systems	Spring 2005	4	49
CS419/519	Special Topics: Geometric Processing	Spring 2005	4	14
CS554	Geometric Modeling	Fall 2005	4	7
CS275	Intro. to Database Systems	Spring 2006	4	53
CS495	Multimedia Projects	Spring 2006	4	7
CS419/519	Image and Flow Synthesis	Winter 2007	4	10
CS275	Intro. to Database Systems	Spring 2007	4	51
CS 495	Multimedia Projects	Spring 2007	4	11
CS554	Geometric Modeling	Fall 2007	4	10
CS440	Database Systems	Winter 2008	4	37
CS419/519	Image and Flow Synthesis	Spring 2008	4	10
CS515	Algorithms and Data Structures	Fall 2008	4	23
CS440	Database Systems	Winter 2009	4	34
CS551	Computer Graphics	Spring 2009	4	6
CS395	Multimedia	Fall 2009	4	16
CS554	Geometric Modeling	Fall 2009	4	5
CS440	Database Systems	Winter 2010	4	32
CS551	Computer Graphics	Spring 2010	4	10
CS554	Geometric Modeling	Fall 2010	4	7
CS440	Database Systems	Winter 2011	4	16
CS275	Intro. to Database Systems	Spring 2011	4	69
CS551	Computer Graphics	Spring 2011	4	7
CS515	Algorithms and Data Structures	Fall 2012	4	41
CS554	Geometric Modeling	Fall 2012	4	7
CS275	Intro. to Database Systems	Spring 2013	4	86
CS551	Computer Graphics	Spring 2013	4	7
CS275	Intro. to Database Systems	Fall 2013	4	65
CS419/519	Vector and Tensor Field Visualization	Winter 2014	4	10
CS275	Intro. to Database Systems	Spring 2014	4	100
CS419/552	Computer Animation	Spring 2014	4	17
CS419/554	Geometry Modeling	Fall 2014	4	13
CS419/551	Computer Graphics	Winter 2015	4	29
CS340	Intro. To Database Systems	Spring 2015	4	15
CS419/519	Vector and Tensor Field Visualization	Spring 2015	4	13

CS340	Intro. To Database Systems	Fall 2015	4	10
CS419/554	Geometry Modeling	Fall 2015	4	6
CS552	Computer Animation	Winter 2016	4	9
CS419/551	Computer Graphics	Spring 2016	4	13
CS419/554	Geometry Modeling	Fall 2016	4	13
CS419/552	Computer Animation	Winter 2017	4	29
CS458/519	Information Visualization	Spring 2017	4	46
CS551	Computer Graphics	Spring 2017	4	7
CS419/554	Geometry Modeling	Fall 2018	4	22
CS419/552	Computer Animation	Winter 2018	4	17
CS458/519	Information Visualization	Spring 2018	4	35
CS419/551	Computer Graphics	Spring 2018	4	18

### **B1.2. Non-Credit Courses and Workshops**

Since September 2004, I have been co-organizing a weekly seminar (non-credit) for the Graphics and Vision group here at OSU along with Professors Mike Bailey, Ron Metoyer, Eric Mortensen, and Sinisa Todorovic from EECS.

In addition, I have organized a weekly seminar (non-credit) for students interested in geometric modeling and computer-generated art from April 2005 to June 2009. The topics and presenters of the past meetings can be found online:

[http://web.engr.orst.edu/~zhange/geometry\\_meetings.html](http://web.engr.orst.edu/~zhange/geometry_meetings.html). Since January 2014, I have been co-organizing a weekly seminar on computer graphics and visualization with Professor Yue Zhang. Details of this seminar can be found online:

[http://web.engr.oregonstate.edu/~zhange/vis\\_sim\\_meetings.html](http://web.engr.oregonstate.edu/~zhange/vis_sim_meetings.html).

From March 2007 to March 2008, I co-organized a weekly seminar (non-credit) on flow visualization with Professors James Liburdy and Sourabh Apte from MIME.

### **B1.3. Course and Curriculum Development**

I have been involved in the development of several courses in the School of EECS:

- (a) **CS554 (Geometric Modeling for Computer Graphics)** is a first-year graduate course that introduces theory and applications of 3D shape modeling. Through lectures and programming assignments, the students gain critical experiences working with 3D models. I created this course.
- (b) **CS419/519 (Image and Flow Synthesis)** was originally titled Geometric Processing when it was offered the first time in Spring 2005. It is a senior and first-year graduate course that focuses on the uses of vector and tensor field analysis and visualization for computer graphics applications such as texture synthesis, computer-generated paintings and drawings, and fluid simulation. Students gain insights and experiences on using fields to guide graphics, a novel approach. I created this course.
- (c) **CS 275 (Intro to Database Systems)** is a second-year undergraduate course that introduces the foundations of database systems. I redesigned the course by generating all teaching materials and exams, and adding a class term project. Each student is asked to identify a database application with realistic complexity and develop a web-based database system that

supports this application. This revision helps the students gain experience in database development.

- (d) **CS 340 (Intro to Database Systems)** is a third-year undergraduate course that introduces the foundations of database systems. This is a course redesigned from CS275. I designed the course by adapting the materials in the course from CS275 and adding some additional advanced topics such as normalization. As for CS275, each student is asked to identify a database application with realistic complexity and develop a web-based database system that supports this application. This revision helps the students realize robust database systems.
- (e) **CS 440 (Database Systems)** is a fourth-year undergraduate course that focuses on advance topics in database systems. I revised the course structure in two ways. First, normalization is covered in greater detail now, allowing students to have a deep understanding of the issues surrounding design anomalies and theoretical foundations in addressing these anomalies. Second, a team-based class term project was added to allow students to gain experience in a team-based development environment in their future workplace. Students are required to present their projects to the whole class in order to practice giving technical talks. I modified and regenerated all teaching materials.
- (f) **CS 458 (Information Visualization)** is a fourth-year undergraduate course that focuses on advance topics in information visualization. I have developed all the course materials after the faculty member who taught the course left OSU. The students in the class learn theory on visual perception and work on team projects. Cutting-edge visualization techniques and concepts are taught. An Intellectual Property manager is invited to give a seminar on patenting software to encourage students to think about creative visualization tools for knowledge discovery.
- (g) **CS 515 (Algorithms and Data Structures)** is a first-year graduate course that introduces students to the principles of design of algorithms and data structures. I revised the curriculum by adding the topic of network flows, which is an essential component in algorithms but had not been covered in the past.
- (h) **CS 419/519 (Vector and Tensor Field Visualization)** is a fourth-year undergraduate and first-year graduate course that introduces students to the advanced visualization techniques on vector and tensor fields. The course has attracted both computer science students as well as students from engineering domains. The term project pairs up one computer science student and one engineering student to develop and implement visualization tools for a domain problem in engineering.

#### **B1.4. Team or Collaborative Efforts**

#### **B1.5. International Teaching**

I have organized and presented a tutorial titled “Rotational Symmetries on Surfaces: Theory, Algorithms, and Applications” at SIGGRAPH ASIA 2016.

In addition, I co-organized and co-presented a tutorial titled “Introduction to Tensor Field Visualization: Concepts, Processing, and Visualization” at IEEE Vis Conference 2014. I also co-

organized and co-presented a tutorial titled “Tensors in Visualization” at IEEE Vis Conference 2010.

## B2. Advising

### B2.1. Graduate Advisees – Completed

Student	Degree	Thesis	Graduated
1. Mariam Guizani	MS	<i>Coincident Nodes Multi-Edge Graph for Simultaneous Decision and Objective Space Multi-Dimensional Visualization</i>	Spring 2018
2. Xiaofei Gao (co-advisor)	MS	<i>Applying 2D Tensor Field Topology to Solid Mechanics Simulations</i>	Spring 2018
3. Ritesh Sharma	MS	<i>Interactive Design and Transition Point Analysis of 3D Symmetric Tensor Fields</i>	Spring 2017
4. Sanaz Golbabaei	MS	<i>Branched covering space construction and visualization</i>	Spring 2016
5. Manuel Dobusch (**supervisor and co-examiner)	MS	<i>Computational fluid dynamics for simulation of wind-terrain interaction in flight simulation</i>	Spring 2016
6. Jonathan Palacios	PhD	<i>Tensor field design and analysis for applications in computer graphics and scientific visualization</i>	Spring 2015
7. Zhongzang Lin	MS	<i>2D second-order asymmetric tensor field analysis and visualization</i>	Fall 2010
8. Darrel Palke	MS	<i>Hybrid visualization of asymmetric tensor fields: glyphs and hyperstreamlines</i>	Spring 2010
9. Guoning Chen	PhD	<i>Topological analysis, visualization, and design of vector fields on surfaces</i>	Summer 2009
10. Jun Zhang	MS	<i>An Implementation of graph cut textures: image and video synthesis using graph cuts</i>	Spring 2009
11. Mizuki Kagaya	MS	<i>Painterly rendering using space-time style parameters</i>	Spring 2009
12. Mathieu Martin (co-advisor)	MS	<i>Numerical study of flow maldistribution in microchannels using fully resolved simulation</i>	Winter 2009
13. Gregory Esch	MS	<i>Visualization and design systems for road infrastructure</i>	Fall 2008
14. Patrick J. Neill	MS	<i>Fluid flow on interacting, deformable surfaces</i>	Spring 2008
15. Philip Maura (*supervisor and co-examiner)	MS	<i>Planar-reflective symmetry in 3D-space</i>	February 2007

\*\* Manuel Dobusch received a Master's degree from University of Applied Sciences, Salzburg, Austria in 2016. His thesis was based on work done at Oregon State University in 2016. I was his supervisor while he was at OSU and the co-examiner of his thesis.

\* Philip Maura received a Master's degree from University of Applied Sciences, Offenburg, Germany in 2007. His thesis was based on work done at Oregon State University in 2006. I was his supervisor while he was at OSU and the co-examiner of his thesis.

## **B2.2. Graduate Advisees – Current**

<b>Student</b>	<b>Degree</b>	<b>Expected Graduation</b>	<b>Advanced to Candidacy (Y/N)</b>
1. Botong Qu	PhD	Spring 2019	Y
2. Prashant Kumar	PhD	Spring 2019	Y
3. Fariba Khan	PhD	Spring 2021	N
4. Lance Roy	PhD	Spring 2021	N
5. JinTa Zheng	PhD	Spring 2022	N
6. Josiah Blaisdell	PhD	Spring 2023	N
7. Shih-Hsuan Hung	PhD	Spring 2023	N
8. Jacoby Jaeger	MS	Spring 2020	-
9. Nghi Duong	MS	Spring 2020	-
10. Yeajin Kim	MS	Spring 2020	-

## **B2.3. Graduate Thesis or Project Committees**

### **MEng Advisor:**

#### ***Graduated***

1. Qingqing Deng, MEng, 2012
2. Vivek Jadye, MEng, 2011

#### ***Current***

### **Minor Professor or Committee Member:**

#### ***Graduated***

1. Karl Smeltzer, PhD, 2018
2. Yifan Shen, MS, 2018
3. Harrison Ko, PhD, 2018 (Civil Engineering)
4. Shashank Moghe, MEng, 2018
5. Magesh Kumar Murali, MEng, 2018
6. Anahita Sanandaji, PhD, 2018
7. Alex Way, MS, 2018
8. Zhicheng Fu, MS, 2018
9. Ali Alsalehy, MS, 2018
10. Sean Moore, MEng, 2018
11. Matt Clothier, PhD, 2017
12. Joseph Boyd, MEng, 2017 (Mechanical Engineering)
13. Chunyang Zhang, MEng, 2017
14. Charles Robinson, PhD, Mathematics, 2017
15. Anirban Roy, PhD, 2017
16. David Stuve, MS, 2017
17. Basim Iskandarani, MS, 2017
18. Matt Viedorfer, MS, 2017
19. Chenyu Wang, MS, 2017
20. Masayoshi Tamura, MEng, 2016
21. Punyapich Limsuwan, MEng, 2016
22. Xiaowei Zhang, MEng, 2016
23. Behrooz Mahasseni, PhD, 2016
24. William Leslie, MS, 2016
25. Daniel Stephen, MS, Geography, 2016

26. James Schneidereit, MS, 2016
27. Farzad Zafarani, MS, 2016
28. Alexander Clucas, MS, 2016
29. Chris Schultz, MS 2016
30. Bryan Pawlowski, MS 2015
31. Kaishuo Wang, MEng, 2014
32. Ruidi Sun, MEng, 2014
33. Shuai Xu, MEng, 2014
34. Mohamed Amer, PhD, 2014
35. Amit Bawaskar, MS, 2014
36. Anirban Roy, MS, 2013
37. Yongshuai Chen, PhD, Civil Engineering, 2013
38. Randy Rauwendaal, PhD, 2013
39. Tuan Pham, PhD, 2013
40. David Günther, PhD (Max-Planck-Institute in Informatics), 2013
41. Randy Rauwendaal, MS, 2012
42. Jiajian Chen PhD (Georgia Institute of Technology), 2012
43. Matthias Nieser, PhD Freie Universität Berlin, 2012
44. Anna Harutyunyan, MS, 2012
45. Nick Schultz, MS, 2011
46. Kyle Hatcher, MS, 2011
47. Adam Leibel, MS, 2011
48. William Brendal, PhD, 2010
49. Nicole Czarnomski, PhD, 2010
50. Nirut Chalaini, MS, 2010
51. Tian Liu, MS, 2010
52. Charles Evans, MS, 2009
53. Vikram Iyer, MS, 2009
54. Ramkumar Sevenan, MS, 2009
55. Mathieu Martin, MS, 2009
56. Daniel Morse, PhD, 2008
57. Stephan Snider, MS, 2008
58. Stephanie Deutschman, MS, 2007
59. Dwayne Robinson, MS, 2007
60. Zhi Wu, MS, 2007
61. Vasumathi Lakshmanan, MS, 2006
62. David Hunt, MS, 2006
63. Haris Gunadi, MS, 2006
64. Ben Hermens, MS, 2006
65. Stanislav Trubin, MS, 2006
66. Shyh-Sen Huang, MS, 2006
67. Shusaku Hanamoto, MS, 2006
68. Yang Li, MS, 2005

***Current***

1. Benjamin Fields, MS (Industrial Engineering)
2. Jun Li, PhD
3. Jane Darbyshire, PhD (Geography)
4. Marjan Adeli, PhD
5. Kenneth Schultz, PhD (Civil Engineering)
6. Hanzhong Xu, PhD



7. Jeffery Knowles, PhD (Civil Engineering)
8. Paris Kalathas, PhD

**Graduate Council Representative:**

1. Stephen Krughoff, PhD, (Mathematics)
2. Joe Umhoefer, PhD, (Mathematics)
3. Sarah Hagen, PhD (Mathematics)
4. Will Mayfield, PhD (Mathematics)
5. Lucas Thompson, MS (Civil Engineering)
6. Jason Anderson, PhD, 2018 (Civil Engineering)
7. Stephen Krughoff, MS, 2016 (Mathematics)
8. Jason Anderson, MS, 2016 (Civil Engineering)
9. Syed Hussain, MS, 2016 (Civil Engineering)
10. Joe Umhoefer, MS, 2016 (Mathematics)
11. Trevor Carey, MS. 2014 (Civil Engineering)
12. Duncan McGregor, MS, 2014 (Mathematics)
13. Kailash C. Ghimire, PhD, 2007 (Mathematics)
14. Tad Schwager, MS, 2005 (COAS)

**B2.4. Undergraduate Research Assistants**

1. Victoria Nelson (Northwestern University, Summer 2015, NSF REU)
2. Christian Brewton (University of Alabama, Summer 2015, NSF REU)
3. Marquis Hackett (University of North Carolina at Chapel Hill, Summer 2015, NSF REU)
4. Jaden Diefenbaugh (Oregon State University, Summer 2015, NSF REU)
5. Francis Williams (Spring 2014)
6. Blaine Eakes (Oregon State University, Summer 2011 - Winter 2012, NSF REU)
7. Heather Shrewsbury (Pasadena City College, Summer 2010, NSF REU/CRA-W)
8. Yun Miao (Mills College, Summer 2010, NSF REU/CRA-W)
9. Danielle Bell (Grove City College, Summer 2009, NSF REU/CRA-W)
10. Stephanie Gulley (St. Edwards University, Summer 2009, NSF REU/CRA-W)
11. Victoria Bailey (Oregon State University, Fall 2007 – Spring 2008, NSF REU)
12. Ian South-Dickinson (Oregon State University, Spring 2006 - Spring 2007, NSF REU)
13. Karena Dokken (Oregon State University, Summer 2006, Intel Fellowship)

Ian South-Dickinson eventually obtained a MS degree from University of British Columbia and is now at NVidia. Victoria Bailey graduated from Oregon State University with an MS degree in Computer Science and works at CMU. Yun Miao obtained a MS degree from Brown University and is now a Google engineer.

**B2.5. Postdoctoral Trainees**

**B2.6. Other Advising**

1. Nicholas Agalzoff, Undergraduate University Honors Thesis, 2016
2. Ian South-Dickinson, Undergraduate University Honors Thesis, 2007
3. Jessica McGregor, Undergraduate University Honors Thesis, 2006

**CS Senior design project:** 2006, Bryan Beck and Dan Keenan, Painterly Rendering from Images. Featured in Corvallis Gazette-Times  
[http://www.gtconnect.com/articles/2006/05/20/news/top\\_story/sat01.txt](http://www.gtconnect.com/articles/2006/05/20/news/top_story/sat01.txt).

**CS Senior design project:** 2007, Ian McDowell and Michael Munn, Tidal Power (co-advised with Prof. Annette von Jouanne).

**Eco-Information Summer Institute:** 2007, Jennifer Hill, Visualization of Forest System.

**Eco-Information Summer Institute:** 2008, Linda Sato and Quincey Blanchard, EcoHydrology: Relationships and Processes Driving Fluctuations in Streamflow (co-advised with Cody Hale and Prof. Julia Jones).

**Eco-Information Summer Institute:** 2009, Alexandra Neagele, Raymundo Navarrete, and Andrew Zdyski, Storm Analysis using Tensor Field Visualization (co-advised with Prof. Julia Jones, Jonathan Palacios, and Chris Daly).

**CEOAS Summer Institute:** 2015, Victoria Nelson (co-advised by Prof. Bernhard Jenny, Prof. Andreas Schmittener, and Ritesh Sharma).

#### **High School Summer Interns:**

I have also sponsored and co-mentored 22 high school students through the “Apprenticeship in Science and Engineering” program organized by the Saturday Academy ([www.saturdayacademy.org/ase/default.aspx](http://www.saturdayacademy.org/ase/default.aspx)).

1. Cymon Dillon (2018) -- Graph Visualization (co-advised with Fariba Khan)
2. Ajay Sridhar (2018) -- Fast Ray Tracing (co-advised with Fariba Khan)
3. Elliot Foley (2018) -- Light Rendering (co-advised with Jinta Zheng)
4. Raymond Liu (2018) --- Fast Light Rendering (co-advised with Jinta Zheng)
5. Jessica Li (2017) – Evenly-spaced streamlines on surfaces (co-advised with Arash Shahbaz)
6. Pragyna Naik (2017) – Geometry remeshing of surfaces (co-advised with Fariba Khan)
7. Sheena Huang (2017) – Physical simulation of snow (co-advised with Paris Kalathas)
8. Aldo Magana (2017) – Rendering of snow (co-advised with Paris Kalathas)
9. Ivy Ding (2016) – Unfolding polygons (co-advised with Botong Qu)
10. Benjamin Allen (2016) – Cancer imaging processing (co-advised with Yi-Fan Shen)
11. Lucas Stella (2016) – Snowflake visualization (co-advised with Paris Kalathas)
12. Lance Roy (2015) – 3D tensor field topology
13. Rachel Helman (2015) - Example-based texture synthesis (co-advised with Botong Qu)
14. Kevin Kincaid (2015) - Painterly rendering from images (co-advised with Sanaz Golbabaiei)
15. Caroline Lerner (2011) – Interactive watercolor rendering with abstraction (co-advised with Qingqing Deng)
16. Spencer Lazaoff (2011) – Painterly rendering from images (co-advised with Qingqing Deng)
17. Amanda Dunn (2010) – Painterly rendering from images (co-advised with Qingqing Deng)
18. Preksha Naik (2010) – 3D tensor field topology (co-advised with Vivek Jadye)

19. Kushal Agarwal (2010) – QuadCover parameterization for quadrangular remeshing (co-advised with Zhongzang Lin)
20. Garrett Egan (2009) – Example-based texture synthesis (co-advised with Qingqing Deng)
21. Shannon Williams (2009) – Shape morphing using implicit surfaces (co-advised with Jonathan Palacios)
22. Abigail Gregory (2009) – Stable fluid simulation (co-advised with Zhongzang Lin)
23. Evan Wu (2008) – Streamline-based flow visualization (co-advised with Zhongzang Lin)
24. Alex Turpin (2007) – Example-based texture synthesis (co-advised with Jonathan Palacios)
25. Steven Milligan (2007) – Stable fluid simulation (co-advised with Guoning Chen)
26. Ian Hovander (2006) – Example-based texture synthesis (co-advised with Jonathan Palacios)

My graduate students and I also have mentored nearly twenty students through another OSU K-12 outreach program, SESEY. In this program, each student works in the Graphics Lab for a week during the summer. Over half of the high school students are females or from other underrepresented groups.

## C. Scholarship and Creative Activity

### C1. Publications

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#### C1.1. Books & Book Chapters

1. Y. Zhang, L. Roy, R. Sharma, and **E. Zhang**, “Maximum Number of Transition Points in 3D Linear Symmetry Tensor Fields”, *Topological Methods in Data Analysis and Visualization V*, 2019 (to appear).
2. Y. Zhang, X. Gao, and **E. Zhang**, “Applying 2D Tensor Field Topology to Solid Mechanics Simulation”, *Modeling, Analysis, and Visualization of Anisotropy*, 2017, pp. 29-41.
3. Y. Zhang, Yu-J. Tzeng and **E. Zhang**, “Maximum Number of Degenerate Curves in 3D Linear Tensor Fields”, *Topological Methods in Data Analysis and Visualization IV*, 2017, pp. 221-234, Springer International Publishing.
4. Y. Zhang, J. Palacios, and **E. Zhang**, “Topology of 3D Linear Symmetric Tensor Fields”, *Visualization and Processing of Higher Order Descriptors for Multi-Valued Data*, 2015, pp. 73-91, Springer International Publishing.
5. **E. Zhang** and Y. Zhang, “3D Symmetric Tensor Fields: What We Know and Where to Go Next”, *Topological and Statistical Methods for Complex Data*, 2015, pp. 111-124, Springer Berlin Heidelberg.
6. **E. Zhang** and V. Natarajan, “Derived Fields”, *Scientific Visualization*, 2014, pp. 139-159, Springer London.
7. R.S. Laramée, H. Carr, M. Chen, H. Hauser, L. Linsen, K. Mueller, V. Natarajan, H. Obermaier, R. Peikert, and **E. Zhang**, “Future Challenges and Unsolved Problems in Multi-Field Visualization”, *Scientific Visualization*, 2014, pp. 205-211, Springer London.
8. M. Hlawitschka, I. Hotz, A. Kratz, G.E. Marai, R. Moreno, G. Scheuermann, M. Stommel, A. Wiebel, and **E. Zhang**, “Top Challenges in the Visualization of Engineering Tensor Fields”, *Visualization and Processing of Tensor Fields and Higher-Order Descriptors for Multi-Valued Data*, 2014, pp. 3-15, Springer Berlin Heidelberg.
9. **E. Zhang**, “Tensors in Geometry Processing”, *Visualization and Processing of Tensor Fields and Higher-Order Descriptors for Multi-Valued Data*, 2014, pp. 295-311, Springer Berlin Heidelberg.
10. **E. Zhang**, “NPR for Traditional Genres”, *Image and Video-Based Artistic Stylisation, 2013*, pp. 103-124, Springer London.
11. Z. Lin, H. Yeh, R.S. Laramée, and **E. Zhang**, “2D Asymmetric Tensor Field Topology”, *Topology-Based Methods in Visualization IV (Mathematics and Visualization)*, 2012, pp. 191-204, Springer Berlin Heidelberg.
12. **E. Zhang**, “Tensor Field Design: Algorithms and Applications”, *New Developments in the Visualization and Processing of Tensor Fields*, 2012, pp. 111-133, Springer Berlin Heidelberg.
13. R.S. Laramée, G. Chen, M. Jankun-Kelly, **E. Zhang**, and D. Thompson, “Bringing Topology-Based Flow Visualization to the Application Domain”, *Topology-Based Methods in Visualization II (Mathematics and Visualization)*, 2008, pp. 161-176, Springer Berlin Heidelberg.

#### C1.2. Refereed Journal Publications

1. L. Roy, P. Kumar, Y. Zhang, and **E. Zhang**, “Robust and Fast Extraction of 3D Symmetric Tensor Field Topology”, *IEEE Transactions on Visualization and Computer Graphics*, to appear.
2. N. Gao, B. Qu, Z. Xing, X. Ji, **E. Zhang**, and H. Liu, “Development of Novel Polyethylene Air-Cathode Material for Microbial Fuel Cells”, *Energy*, 155 (C), 2018, pp. 763-771.
3. L. Cooper, A. Meier, M.A. Laporte, J. Elser, C. Mungall, B.T. Sinn, D. Carvaliere, S. Carbon, N.A. Dunn, B. Smith, B. Qu, J. Preece, **E. Zhang**, S. Todorovic, G. Gkoutos, J. Doonan, D. Stevenson, E. Arnaud, and P. Jaiswal, “The Planteome Database: an Integrated Resource for Reference Ontologies, Plant Genomics, and Phenomics Data”, *Nucleic Acids Research* 46 (D1), 2018, pp. D1168-D1180.
4. L. Roy, P. Kumar, S. Golbabaee, Y. Zhang, and **E. Zhang**, “Interactive Design and Visualization of Branched Covering Spaces”, *IEEE Transactions on Visualization and Computer Graphics*, 24 (1), 2018, pp. 843-852.
5. Y.C. Lai, B.A. Chen, K.W. Chen, W.L. Si, C.Y. Yao, and **E. Zhang**, “Data-Driven NPR Illustrations of Natural Flows in Chinese Painting”, *IEEE Transactions on Visualization and Computer Graphics*, 23 (12), 2017, pp. 2535-2549.
6. J. Palacios, L. Roy, P. Kumar, C.Y. Hsu, W. Chen, C. Ma, L.-Y. Wei, and **E. Zhang**, “Tensor Field Design in Volumes”, *ACM Transactions on Graphics*, 36 (6), 2017, pp. 188:1-188:15.
7. K. Xu, L. Zheng, Z. Yan, G. Yan, **E. Zhang**, M. Niessener, O. Deussen, D. Cohen-Or, H. Huang, “Autonomous Reconstruction of Unknown Indoor Scenes Guided by Time-varying Tensor Fields”, *ACM Transaction on Graphics*, 36 (6), 2017, pp. 202:1-202:15.
8. B. Jenny, D. Stephen, I. Muehlenhaus, B. Marston, R. Sharma, **E. Zhang**, and H. Jenny, “Force-Directed Layout of Origin-Destination Flow Maps”, *International Journal of Geographical Information Science*, 2017, 31 (8), pp. 1521-1540.
9. B. Jenny, D. Stephen, I. Muehlenhaus, B. Marston, R. Sharma, **E. Zhang**, and H. Jenny, “Design Principles for Origin-Destination Flow Maps”, *Cartography and Geographic Information Science*, 2016, pp. 1-15.
10. J. Palacios, H. Yeh, W. Wang, Y. Zhang, R.S. Laramee, R. Sharma, T. Schultz, and **E. Zhang**, “Feature Surfaces in Symmetric Tensor Fields Based on Eigenvalue Manifold”, *IEEE Transactions on Visualization and Computer Graphics*, 22 (3), 2016, pp. 1248-1260.
11. M.H. Ngyuen, B. Wünsche, P. Delmas, C. Lutteroth, and **E. Zhang**, “A Robust Hybrid Image-Based Modeling System”, *The Visual Computer*, 32 (5), 2016, pp. 1-16.
12. Y. Chen, **E. Zhang**, and H. Yeh, “Laboratory Experiment on Counter-Propagating Collisions of Solitary Waves, Part 2, Flow Field”, *Journal of Fluid Mechanics*, 755, 2014, pp. 463-484.
13. M.T. Chi, C.Y. Yao, **E. Zhang** and T.Y. Lee, “Optical Illusion Shape Texturing Using Repeated Asymmetric Patterns”, *The Visual Computer*, 30 (6-8), 2014, pp. 809-819.
14. Y. Zheng, C.-L. Tai, and **E. Zhang**, “Pairwise Harmonics for Shape Analysis”, *IEEE Transactions on Visualization and Computer Graphics*, 19 (7), 2013, pp. 1172-1184.
15. G. Chen, V. Kwatra, L.Y. Wei, C. Hansen, and **E. Zhang**, “Design of 2D Time-Varying Vector Fields”, *IEEE Transactions on Visualization and Computer Graphics*, 18 (10), 2012, pp. 1717-1730.
16. M. Edmunds, R.S. Laramee, G. Chen, N. Max, **E. Zhang**, and C. Ware, “Surface-Based Flow Visualization”, *Computer and Graphics*, 36 (8), 2012, pp. 974-990.
17. M. Edmunds, R.S. Laramee, R. Malki, I. Masters, T.N. Croft, G. Chen, and **E. Zhang**, “Automatic Stream Surface Seeding: A Feature-Centered Approach”, *Computer Graphics Forum*, 31 (3), 2012, pp. 1095-1104.

18. A. Szymczak and **E. Zhang**, “Robust Morse Decompositions of Piecewise Constant Vector Fields on Surfaces”, *IEEE Transactions on Visualization and Computer Graphics*, 18 (6), 2012, pp. 938-951.
19. M. Nieser, J. Palacios, K. Polthier, and **E. Zhang**, “Hexagonal Global Parameterization of Arbitrary Surfaces”, *IEEE Transactions on Visualization and Computer Graphics*, 18 (6), 2012, pp. 865-878.
20. G. Chen, Q. Deng, A. Szymczak, R.S. Laramée, and **E. Zhang**, “Morse Set Classification and Hierarchical Refinement Using Conley Index”, *IEEE Transactions on Visualization and Computer Graphics*, 18 (5), 2012, pp. 767-782.
21. C.H. Peng, **E. Zhang**, Y. Kobayashi, and P. Wonka, “Connectivity Editing for Quadrilateral Meshes”, *ACM Transactions on Graphics*, 30 (6), 2011, pp. 141:1-141:12.
22. G. Chen, D. Palke, Z. Lin, H. Yeh, P. Vincent, R.S. Laramée, and **E. Zhang**, “Asymmetric Tensor Field Visualization for Surfaces”, *IEEE Transactions on Visualization and Computer Graphics*, 17 (6), 2011, pp. 1979-1988.
23. J. Gregson, A. Sheffer, and **E. Zhang**, “All-Hex Mesh Generation via Volumetric PolyCube Parameterization”, *Computer Graphics Forum*, 30 (5), 2011, pp. 1407-1416.
24. J. Palacios and **E. Zhang**, “Interactive Visualization of Rotational Symmetry Fields on Surfaces”, *IEEE Transactions on Visualization and Computer Graphics*, 17 (3), 2011, pp. 947-955.
25. Y. Li, F. Bao, **E. Zhang**, Y. Kobayashi, P. Wonka, “Geometry Synthesis on Surfaces Using Field-Guided Shape Grammars”, *IEEE Transactions on Visualization and Computer Graphics*, 17 (2), 2011, pp. 231-243.
26. M. Kagaya, W. Brendel, Q. Deng, T. Kesterson, S. Todorovic, P.J. Neill, and **E. Zhang**, “Video Painting with Space-Time-Varying Style Parameters.” *IEEE Transactions on Visualization and Computer Graphics*, 17 (1), 2011, pp. 74-87.
27. Y. Li, **E. Zhang**, Y. Kobayashi, and P. Wonka, “Editing Operations for Irregular Vertices in Triangle Meshes”, *ACM Transactions on Graphics*, 29 (6), 2010, pp. 153:1-153:11.
28. T. Pham, R. Hess, C. Ju, **E. Zhang**, and R. Metoyer, “Visualization of Diversity in Large Multivariate Data Sets”, *IEEE Transactions on Visualization and Computer Graphics*, 16 (6), 2010, pp. 1053-1062.
29. Y.-K. Lai, M. Jin, X. Xie, Y. He, J. Palacios, **E. Zhang**, S.-M. Hu, and X. Gu, “Metric-Driven RoSy Field Design and Remeshing”, *IEEE Transactions on Visualization and Computer Graphics*, 16 (1), 2010, pp. 95-108.
30. G. Esch, M.H. Scott, and **E. Zhang**, “Graphical 3D Visualization of Highway Bridge Ratings”, *Journal of Computing in Civil Engineering*, 23 (6), 2009, pp. 355-362.
31. B. Spencer, R.S. Laramée, G. Chen, and **E. Zhang**, “Evenly-Spaced Streamlines for Surfaces: An Image-Based Approach”, *Computer Graphics Forum*, 28 (6), 2009, pp. 1618-1631.
32. **E. Zhang**, H. Yeh, Z. Lin, and R.S. Laramée, “Asymmetric Tensor Analysis for Flow Visualization,” *IEEE Transactions on Visualization and Computer Graphics*, 15 (1), 2009, pp. 106-122.
33. G. Chen, Z. Lin, D. Morse, S. Snider, S.V. Apte, J. Liburdy, and **E. Zhang**, “Multiscale Feature Detection in Unsteady Separated Flows,” *International Journal of Numerical Analysis and Modeling*, 5, 2008, pp. 17-35.
34. K. Zhou, **E. Zhang**, J. Bittner, and P. Wonka, “Visibility-Driven Mesh Analysis and Visualization through Graph Cuts”, *IEEE Transactions on Visualization and Computer Graphics*, 14 (6), 2008, pp. 1667-1674.
35. G. Chen, G. Esch, P. Wonka, P. Mueller, and **E. Zhang**, “Interactive Procedural Street Modeling”, *ACM Transactions on Graphics*, 27 (3), 2008, pp. 103:1-103:10.

36. G. Chen, K. Mischaikow, R.S. Laramée, and **E. Zhang**, “Efficient Morse Decompositions of Vector Fields”, *IEEE Transactions on Visualization and Computer Graphics*, 14 (4), 2008, pp. 848-862.
37. J. Palacios and E. Zhang, “Rotational Symmetry Field Design on Surfaces”, *ACM Transactions on Graphics*, 26 (3), 2007, pp. 55:1-55:10.
38. G. Chen, K. Mischaikow, R.S. Laramée, P. Pawel, and **E. Zhang**, “Vector Field Editing and Periodic Orbit Extraction Using Morse Decomposition”, *IEEE Transactions on Visualization and Computer Graphics*, 13 (4), 2007, pp. 769-785.
39. **E. Zhang**, J. Hays, and G. Turk, “Interactive Tensor Field Design and Visualization on Surfaces”, *IEEE Transactions on Visualization and Computer Graphics*, 13 (1), 2007, pp. 94-107.
40. **E. Zhang**, K. Mischaikow, and G. Turk, “Vector Field Design on Surfaces”, *ACM Transactions on Graphics*, 25 (4), 2006, pp. 1294-1326.
41. **E. Zhang**, K. Mischaikow, and G. Turk, “Feature-Based Surface Parameterization and Texture Mapping”, *ACM Transactions on Graphics*, 24 (1), 2005, pp. 1-27.

### **C1.3. Peer-Reviewed Archival Conference Publications**

The following papers appeared in archival proceedings that were distributed to libraries (the next section covers other types of proceedings). The acceptance rate is indicated as part of the entry whenever the selection process was rigorous.

1. L. Roy, P. Kumar, Y. Zhang, and **E. Zhang**, “Robust and Fast Extraction of 3D Symmetric Tensor Field Topology”, *IEEE Visualization Conference 2018, October 2018*, 2018, to appear.
2. B. Qu, Y. Zhang, and **E. Zhang**, “Interactive Multi-Style Pen-and-Ink Stylization of Images”, *SIGGRAPH ASIA 2017 Technical Briefs*, 2017, pp. 2:1-2:4.
3. B. Qu, P. Kumar, **E. Zhang**, P. Jaiswal, L. Cooper, J. Elser, Y. Zhang, “Interactive Design and Visualization of N-ary Relationship”, *SIGGRAPH ASIA Symposium on Visualization 2017*, pp. 15:1-15:8.
4. L. Roy, P. Kumar, S. Golbabaie, Y. Zhang, and **E. Zhang**, “Interactive Design and Visualization of Branched Covering Spaces”, *IEEE Visualization Conference 2017, October 2017*, 2017, pp. 843-852.
5. J. Palacios, L. Roy, P. Kumar, C.Y. Hsu, W. Chen, C. Ma, L.-Y. Wei, and **E. Zhang**, “Tensor Field Design in Volumes”, *SIGGRAPH ASIA 2017*, pp. 188:1-188:15.
6. K. Xu, L. Zheng, Z. Yan, G. Yan, **E. Zhang**, M. Niessener, O. Deussen, D. Cohen-Or, H. Huang, “Autonomous Reconstruction of Unknown Indoor Scenes Guided by Time-varying Tensor Fields”, *SIGGRAPH ASIA 2017*, pp. 202:1-202:15.
7. D. Rees, R.S. Laramée, D. Nguyen, L. Zhang, G. Chen, H. Yeh, and **E. Zhang**, “A Stream Ribbon Seeding Strategy”, *EuroVis 2017 (short paper)*, 2017.
8. Y. Zhang, L. Roy, R. Sharma, and **E. Zhang**, “Maximum Number of Transition Points in 3D Linear Symmetry Tensor Fields”, *Topology-Based Methods in Visualization Conference Proceeding 2017*, 2017.
9. **E. Zhang**, V. Jadye, C. Escher, P. Wonka, Y. Zhang, and X. Gao, “Horizon Measures: A Novel View-Independent Shape Descriptor”, *SIGGRAPH ASIA 2016 Technical Briefs*, 2016, pp. 20:1-20:4.
10. J. Palacios, C. Ma, W. Chen, L.Y. Wei, and **E. Zhang**, “Tensor Field Design in Volumes”, *SIGGRAPH ASIA 2016 Technical Briefs*, 2016, pp. 18:1-18:4.
11. F. Williams and **E. Zhang**, “Rendering Kaleidoscopic Scenes Using Orbifold Theory”, *SIGGRAPH ASIA 2016 Technical Briefs*, 2016, pp. 17:1-17:4.

12. S. Golbabaie, L. Roy, P. Kumar, and **E. Zhang**, "Construction and Visualization of Branched Covering Spaces", *SIGGRAPH ASIA 2016 Technical Briefs*, 2016, pp. 16:1-16:4.
13. L. Cooper, A. Meier, J. Elser, J. Preece, X. Xu, R. Kitchen, B. Qu, **E. Zhang**, S. Todorovic, P. Jaiswal, M.A. Laporte, E. Arnaud, S. Carbon, C. Mungall, B. Smith, G. Gkoutos, and J. Doonan, "The Planteome Project", *Proceedings of International Conference on Biological Ontology and BioCreative*, 2016.
14. B. Qu, J. Diefenbaugh, **E. Zhang**, J. Elser, P. Jaiswal, S. Carbon, and C. Mungall, "Planteome Gene Annotation Enrichment Analysis", *Proceedings of International Conference on Biological Ontology and BioCreative*, 2016.
15. A. Clucas, P. Sannecy, **E. Zhang**, and Y. Zhang, "Modeling of Tire Rolling on Roads in Wintry Weather with Material Point Method", *National Agency for Finite Element Methods and Standards (NAFEMS) World Congress*, 2015.
16. Y. Zhang, Yu-J. Tzeng and **E. Zhang**, "Maximum Number of Degenerate Curves in 3D Linear Tensor Fields", *Topology-Based Methods in Visualization Conference Proceeding 2015*, 2015.
17. M. Edmunds, R.S. Laramee, R. Malki, I. Masters, Y. Wang, G. Chen, **E. Zhang**, and N. Max, "Interactive Stream Surface Placement: A Hybrid Clustering Approach Supported by Tree Maps", *International Conference on Information Visualization Theory and Applications (IVAPP) 2014*, 2014, pp. 347-355.
18. M.T. Chi, C.Y. Yao, T.Y. Lee, and **E. Zhang**, "Illusory Motions on Surfaces", *Computer-Aided Design and Computer Graphics (CAD/CG) 2013*, 2013, pp. 419-420.
19. M.H. Ngyuen, B. Wünsche, P. Delmas, C. Lutteroth, W. ver der Mark, and **E. Zhang**, "High-Definition Texture Reconstruction for 3D Image-Based Modeling", *WSCG 2013*, 2013, pp. 39-48.
20. C. Auer, J. Kasten, **E. Zhang**, and I. Hotz, "Automatic Tensor-Guided Illustrative Vector Field Visualization", *PacificVis 2013*, 2013, pp. 265-275.
21. M. Edmunds, R.S. Laramee, G. Chen, **E. Zhang**, and N. Max, "Advanced, Automatic Stream Surface Seeding and Filtering", *EG UK Theory and Practice of Computer Graphics (TPCG) 2012*, 2012, pp. 53-60.
22. M. Edmunds, R.S. Laramee, R. Malki, I. Masters, T.N. Croft, G. Chen, and **E. Zhang**, "Automatic Stream Surface Seeding: A Feature-Centered Approach", *EuroVis 2012*, 2012, pp. 1095-1104.
23. C.H. Peng, **E. Zhang**, Y. Kobayashi, and P. Wonka, "Connectivity Editing for Quadrilateral Meshes", *SIGGRAPH ASIA 2011*, 2011, pp. 141:1-141:12.
24. G. Chen, D. Palke, Z. Lin, H. Yeh, P. Vincent, R.S. Laramee, and **E. Zhang**, "Asymmetric Tensor Field Visualization for Surfaces", *IEEE Visualization Conference 2011*, October 2011, pp. 1979-1988.
25. H. Yeh, B. Seiffert, and **E. Zhang**, "Tensor Field Visualization for Wake under Single Pulse Flow", *2011 IAHR Conference*, Brisbane, Australia. 2011.
26. M. Edmunds, T. McLoughlin, R.S. Laramee, G. Chen, N. Max, and **E. Zhang**, "Automatic Stream Surface Seeding", *EuroGraphics 2011 Short Papers*, 2011, pp. 53-56.
27. J. Gregson, A. Sheffer, and **E. Zhang**, "All-Hex Mesh Generation via Volumetric PolyCube Parameterization", *Symposium on Geometry Processing*, 2011, pp. 1407-1416.
28. T. McLoughlin, M. Edmunds, R.S. Laramee, M.W. Jones, G. Chen, and **E. Zhang**, "Using Integral Surfaces to Visualize CFD Simulation Results", *NAFEMS World Congress Conference Proceedings 2011, The International Association for the Engineering Analysis Community*, May 2011, pp. 100, Boston, Massachusetts.
29. Y. Li, **E. Zhang**, Y. Kobayashi, and P. Wonka, "Editing Operations for Irregular Vertices in Triangle Meshes", *SIGGRAPH ASIA 2010*, 2010, pp. 153:1-153:11.



30. M. Nieser, J. Palacios, K. Polthier, and **E. Zhang**, “Hexagonal Global Parameterization of Arbitrary Surfaces”, *SIGGRAPH ASIA 2010 Sketch*, 2010.
31. T. Pham, R. Hess, C. Ju, **E. Zhang**, and R. Metoyer, “Visualization of Diversity in Large Multivariate Data Sets”, *IEEE Visualization Conference 2010*, October 2010, pp. 1053-1062.
32. T. McLoughlin, R.S. Laramée, and **E. Zhang**, “Constructing Streak Surfaces for 3D Unsteady Vector Fields”, *Proceeding of Spring Conference on Computer Graphics (SCCG 2010)*, 2010, pp. 25-32.
33. H.Q. Dinh, L.Xu, Z. Lin, **E. Zhang**, and R.S. Laramée, “A Distribution-Based Approach to Tracking Points in Velocity Vector Fields”, *Proceeding of IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2009*, June 2009, pp. 2663-2670, Miami FL.
34. Z. Peng, R.S. Laramée, G. Chen, and **E. Zhang**, “Glyph and Streamline Placement Algorithms for CFD Simulation Data”, *NAFEMS World Congress Conference Proceedings 2009, The International Association for the Engineering Analysis Community*, June 2009, Crete, Greece.
35. T. McLoughlin, R.S. Laramée, and **E. Zhang**, “Easy Integral Surfaces: A Fast, Quad-Based Stream and Path Surface Algorithm”, *Proceeding of Computer Graphics International (CGI)*, May 2009, Victoria, Canada.
36. K. Zhou, **E. Zhang**, J. Bittner, and P. Wonka, “Visibility-Driven Mesh Analysis and Visualization through Graph Cuts”, *IEEE Visualization Conference 2008*, October 2008, pp. 1667-1674.
37. G. Chen, G. Esch, P. Wonka, P. Mueller, and **E. Zhang**, “Interactive Procedural Street Modeling”, *ACM SIGGRAPH 2008*, 2008, pp. 103:1-103:10.
38. S. Snider, D. Morse, G. Chen, S. Apte, J. Liburdy, and **E. Zhang**, “Detection and Analysis of Separated Flow Induced Vortical Structures”, *46<sup>th</sup> AIAA Aerospace Sciences Meetings and Exhibit*, January 2008, AIAA 2008-361.
39. J. Palacios and **E. Zhang**, “Rotational Symmetry Field Design on Surfaces”, *ACM SIGGRAPH 2007*, 2007, pp. 55:1-55:10.
40. G. Esch, P. Wonka, P. Mueller, and **E. Zhang**, “Interactive Procedural Street Modeling”, *SIGGRAPH 2007 Sketech*, 2007.
41. P.J. Neill, R. Metoyer, and **E. Zhang**, “Fluid Flow on Interacting Deformable Surfaces”, *SIGGRAPH 2007 Poster*, 2007.
42. G. Chen, R.S. Laramée, and **E. Zhang**, “Advanced Visualization of Engine Simulation Data Using Texture Synthesis and Topological Analysis”, *NAFEMS World Congress Conference Proceedings 2007, The International Association for the Engineering Analysis Community*, June 2007, Vancouver, Canada.
43. **E. Zhang**, J. Hays, and G. Turk, “Interactive Design and Visualization of Tensor Fields on Surfaces”, *SIGGRAPH Sketech 2005*, 2005.
44. **E. Zhang** and G. Turk, “Visibility-Guided Simplification”, *Proceedings of IEEE Visualization 2002, Boston, MA*, October 2002, pp. 267-274.
45. J. Stasko and **E. Zhang**, “Focus+Context Display and Navigation Techniques for Enhancing Radial, Space-Filling Hierarchy Visualizations”, *Proceedings of IEEE Symposium on Information Visualization 2000, Salt Lake City, UT*, October 2000, pp. 57-65.

#### **C1.4. Other Peer-Reviewed Publications**

The following papers appeared in proceedings that were distributed primarily to attendees (as CDs, printed volumes, availability through a public website, etc.).

1. V. Nelson, R. Sharma, **E. Zhang**, A. Schmittener, and B. Jenny, “3D Visualization of Global Ocean Circulation”, a Poster at American Geography Union’s Fall Meeting, 2015.

2. L. Cooper, J. Elser, J. Preece, E. Arnaud, D. Stevenson, S. Tororovic, **E. Zhang**, C. Mungall, B. Smith, and P. Jaiswal, “Common Reference Ontologies for Plant Biology (cROP), A Platform for Integrative Plant Genomics”, a Poster at Plant and Animal Genome XXII, 2014.
3. A.P. Zdyrski, A.C. Naegele, R. Navarrete, J.A. Jones, **E. Zhang**, and J. Palacios, “Visualization of Eastern Pacific Atmospheric Dynamics During the Record Flood of 1996 in Oregon Using Global Reconstructed Datasets”, a Poster at American Geography Union’s Fall Meeting, 2012.

### **C1.5. Papers Currently under Peer Review**

1. B. Qu, P. Kumar, **E. Zhang**, P. Jaiswal, L. Cooper, J. Elser, Y. Zhang, “Visualization of N-ary Relationship”, *IEEE Transactions on Visualization and Computer Graphics*, (under review).

### **C1.6. Other Publications**

List other scholarly publications.

## **C2. Professional Meetings, Symposia, and Conferences**

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### **C2.1. Presentations to Professional Groups** (includes presentations of papers cited in C1.3)

- Contributed Talk, World Congress in Computational Mechanics (WCCM) 2018, Minisymposium on Geometry Processing and Field-Aligned Mesh Generation for Computational Science and Engineering Applications, “Tensor Field Design on Volumes”, July 25, 2018.
- Contributed Talk, NSF-Sponsored Seafloor Sensors/Instrumentation Workshop, “Tensor Field Visualization and Potential Applications in Seafloor Sensing”, July 12, 2018.
- Contributed Talk, SIGGRAPH ASIA 2017 Symposium on Visualization, “Interactive Design and Visualization of N-ary Relationship”, December 2, 2017.
- Contributed Talk, SIGGRAPH ASIA 2017 Technical Brief, “Interactive Multi-Style Pen-and-Ink Stylization of Images”, December 1, 2017.
- Contributed Talk, SIGGRAPH ASIA 2017, “Tensor Field Design in Volumes”, Nov. 31, 2017.
- Contributed Talk, IEEE Visualization Conference 2017, “Interactive Design and Visualization of Branched Covering Spaces”, October 4, 2017.
- Contributed Talk, SIAM Conference on Industrial and Applied Geometry, Minisymposium on Discrete Vector Field Analysis and Applications, “Vector Field Visualization with Gradient Tensor Analysis”, July 12, 2017.
- Invited Talk, Applied Mathematics and Computation Seminar, Department of Mathematics, Oregon State University, “Construction and Visualization of Branched Covering Spaces”, March 3, 2017.
- Contributed Talk, SIGGRAPH ASIA 2016 Technical Brief, “Tensor Field Design in Volumes”, December 6, 2016.
- Contributed Talk, SIGGRAPH ASIA 2016 Technical Brief, “Construction and Visualization of Branched Covering Spaces”, December 6, 2016.
- Contributed Talk, SIGGRAPH ASIA 2016, TVCG session, “Feature Surfaces in Symmetric Tensor Fields Based on Eigenvalue Manifold”, December 6, 2016.

- Course Lecture, SIGGRAPH ASIA 2016, “Rotational Symmetries on Surfaces: Theory, Algorithms, and Applications”, December 6, 2016.
- Contributed Talk, IEEE Visualization Conference 2016, TVCG session, “Feature Surfaces in Symmetric Tensor Fields Based on Eigenvalue Manifold”, October 27, 2016.
- Invited Talk, Applied Mathematics and Computation Seminar, Department of Mathematics, Oregon State University, “Horizon Measures: a Novel View-Independent Shape Descriptor”, April 10, 2015.
- Course Lecture, IEEE Visualization Conference 2014, “Introduction to Tensor Field Visualization: Concepts, Processing, and Visualization”, November 10, 2014.
- Invited Talk, Topology and Geometry Seminar, Department of Mathematics, Oregon State University, “The Topology of 3D Symmetric Tensor Fields”, April 5, 2014.
- Invited Talk, Applied Mathematics and Computation Seminar, Department of Mathematics, Oregon State University, “Hexagonal Global Parameterization of Arbitrary Surfaces,” April 5, 2013.
- Invited Talk, Visualization Seminar, University of Stuttgart, “Topological Analysis and Visualization of 2D Asymmetric Tensor Fields”, July 8, 2013.
- Invited Talk, Computer Graphics Seminar, Trinity College Dublin, “Video Painting with Space-Time-Varying Style Parameters”, April 10, 2012.
- Invited Talk, Computer Graphics Seminar, University of Leeds, “Orientation Field Design and Visualization on Surfaces”, April 5, 2012.
- Invited Talk, Computer Graphics Seminar, University College London, “Rotational Symmetries and Applications in Graphics”, March 30, 2012.
- Invited Talk, CGLunch Seminar, Max-Planck-Institute Informatics, “Vector and Tensor Field Design and Processing”, March 15, 2012.
- Invited Talk, Computer Graphics Seminar, TU Dresden, “Orientation Field Design and Visualization on Surfaces”, February 17, 2012.
- Invited Talk, Forschungsseminar Computergrafik, Bildverarbeitung und Visualisierung, Universität Leipzig, “Topological Analysis and Visualization of 2D Asymmetric Tensor Fields”, January 25, 2012.
- Invited Talk, Oberseminar Nonlinear Dynamics, WIAS Berlin, “Efficient Morse Decomposition of Vector Fields”, January 24, 2012.
- Invited Talk, Computer Graphics Seminar, National Chiao-Tung University, “Directional Field Generation on Surfaces”, December 26, 2011.
- Invited Talk, Seminar Numerische Mathematik, WIAS Berlin, “Topological Analysis and Visualization of 2D Asymmetric Tensor Fields”, December 6, 2011.
- Invited Talk, Visual Computing Research Seminar, University of Magdeburg, “Topological Analysis and Visualization of 2D Asymmetric Tensor Fields”, November 11, 2011.
- Invited Talk, Berliner Kolloquium für wissenschaftliche Visualisierung, Berlin Mathematical School and Konrad-Zeus-Zentrum Für Informationstechnik Berlin, “Topological Analysis and Visualization of 2D Asymmetric Tensor Fields”, November 7, 2011.
- Invited Talk, Microsoft Research Asia, “Rotational Symmetries on Surfaces: Design, Visualization, and Applications”, December 20, 2010.
- Contributed Talk, SIGGRAPH ASIA 2010, “Editing Operations for Irregular Vertices in Triangle Meshes”, December 17, 2010.

- Contributed Talk, SIGGRAPH ASIA Sketch 2010, “Hexagonal Global Parameterization of Arbitrary Surfaces”, December 16, 2010.
- Invited Talk, Tsinghua University, “Video Painting with Space-Time-Varying Style Parameters”, December 14, 2010.
- Course Lecture, IEEE VisWeek 2010, “Tensors in Visualization”, October 26, 2010.
- Invited Talk, Lawrence Livermore Visualization Group, “Asymmetric Tensor Analysis for Flow Visualization”, July 23, 2010.
- Invited Talk, NASA Ames, “Asymmetric Tensor Analysis for Flow Visualization”, July 22, 2010.
- Invited Talk, Applied Mathematics and Computation Seminar, Department of Mathematics, Oregon State University, “Asymmetric Tensor Analysis for Flow Visualization,” March 5, 2010.
- Invited Talk, Applied Mathematics and Computation Seminar, Department of Mathematics, Oregon State University, “Discrete Morse Decompositions of Vector Fields,” April 3, 2009.
- Invited Talk, Computer Graphics Group, University of British Columbia, “Vector and Tensor Field Design on Surfaces,” March 28, 2008.
- Invited Talk, Eco-Information IGERT Colloquium, Oregon State University, “Asymmetric Tensor Analysis for Flow Visualization,” February 13, 2008.
- Contributed Talk, SIGGRAPH 2007, “Rotational Symmetry Field Design on Surfaces”, August 8, 2007.
- Invited Talk, Dept. of Computer and Information Science, “Vector and Tensor Field Design on Surfaces,” University of Oregon, November 15, 2006.
- Invited Talk, Dept. Mathematics, “Vector Field Simplification and Periodic Orbit Extraction on Surfaces,” Rutgers University, October 31, 2006.
- Invited Talk, Computer Graphics Group, Princeton University, “Vector and Tensor Field Design on Surfaces,” October 30, 2006.
- Invited Talk, Graphics and Visualization Group, Arizona State University, “Vector Field Simplification and Periodic Orbit Extraction on Surfaces,” October 19, 2006.
- Invited Talk, Applied Mathematics and Computation Seminar, Department of Mathematics, Oregon State University, “Vector Field Simplification and Periodic Orbit Extraction on Surfaces,” October 6, 2006.
- Contributed Talk, SIGGRAPH Sketch 2005, “Interactive Design and Visualization of Tensor Fields on Surfaces”, August 2, 2005.
- Invited Talk, Department of Mathematics, Oregon State University, “Vector Field Design on Surfaces,” February 8, 2005.
- Invited Talk, School of Electrical Engineering and Computer Science, Oregon State University, “Vector Field Design on Surfaces”, April 14, 2004.
- Invited Talk, Computer Science, Stony Brook University, “Vector Field Design on Surfaces,” February 6, 2004.
- Invited Talk, School of Mathematics, Georgia Institute of Technology, “Feature-Based Surface Parameterization and Texture Mapping,” January 30, 2003.
- Contributed Talk, IEEE Visualization, “Visibility-Guided Simplification,” October 31, 2002.

## **C2.2. Participation at Invitational Workshops**

- Topology, Computation, and Data Analysis, May, 2019 (Talk to be given)

- Visualization and Processing of Anisotropy in Imaging, Geometry, and Astronomy, Schloss Dagstuhl Seminar, Saarbrücken, Germany, October-November, 2018 (Talk to be given)
- Visualization and Processing of Higher Order Descriptors of Multi-Valued Data, Schloss Keynote Speaker, Computer Graphics Taiwan 2016, “Tensor Field Topology: Past, Present, and Future”, July 11, 2016.
- Keynote Speaker, Workshop on Structured Meshing: Theory, Applications, and Evaluation, “The Topology of 3D Frame Fields: What It Might Look Like and What We Might Be Able to Do with IT ”, May 26, 2014.
- Visualization and Processing of Higher Order Descriptors of Multi-Valued Data, Schloss Dagstuhl Seminar, Saarbrücken, Germany, February 2014 (Talk: “Tensor Field Analysis: Some Open Problems”, February 19, 2014).
- Workshop on Algebraic Topology in Dynamics, Differential Equations, and Experimental Data, the Institute of Mathematics and its Applications (IMA), Minneapolis, Minnesota, February 2014.
- 2011 International Workshop on Computational Conformal Geometry and Its Applications, Hsinchu, Taiwan, December, 2011 (Talk: “Conformal Geometry and Tensor Fields”, December 24, 2011).
- Visualization and Processing of Tensors and Higher Order Descriptors of Multi-Valued Data, Schloss Dagstuhl Seminar, Saarbrücken, Germany, December 2011 (Talk: “Tensor Field Analysis for Geometry Processing”, December 13, 2011).
- Scientific Visualization, Schloss Dagstuhl Seminar, Saarbrücken, Germany, June 2011 (Talk: “Asymmetric Tensor Field Visualization from a Multi-Field Viewpoint”, June 9, 2011).
- New Development in the Visualization and Processing of Tensor Fields, Schloss Dagstuhl Seminar, Saarbrücken, Germany, July 2009 (Talk: “2D Asymmetric Tensor Field Analysis and Visualization”, July 22, 2009).
- Computational Mathematics of Discrete Surfaces, Banff International Research Station, Banff, Canada, February 2009 (Talk: “Efficient Morse Decomposition of Vector Fields,” February 17, 2009).
- Algebraic Topological Methods in Computer Science, II, London, Ontario, Canada, July 2004 (Talk: “Vector Field Design on Surfaces,” July 20, 2004)

### **C3. Grant and Contract Support**

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List covers grants/contracts on which candidate served as PI or coPI only, including those funded through other institutions. “My share” indicates the amount of funding, if any, over which the candidate had control.

<i>Agency &amp; Dates</i>	<i>PI (and coPIs)</i>	<i>Title</i>	<i>Total Budget</i>	<i>My Share</i>
NSF 4/1/18-3/31/19	C. Parrish, J. Selker, B. Mason, G. Hollinger, A. Trehu, and E. Zhang	Integrating Science Needs with Advanced Seafloor Sensor Engineering to Provide Early Warning of Geohazards: Visioning Workshop and Roadmap for the Future	\$50,000	\$5,000
OHSU/OSU Cancer	E. Zhang and Y. Zhang	Team Building: Visualization for MRI Improvement	\$10,000	\$5,000

Research 8/17-9/18				
NSF 6/17-6/18	E. Zhang	Research Experiences for Undergraduates Supplement to Three-Dimensional Visualization and Analysis of Complex Dynamic Physical Phenomena	\$16,000	\$16,000
NSF 9/16-8/19	E. Zhang	Three-Dimensional Visualization and Analysis of Complex Dynamic Physical Phenomena	\$325,798	\$325,798
NSF 12/14-11/18	P. Jaiswal, E. Arnaud, C. Mungall, S. Todorovic, and E. Zhang	Common Reference Ontologies and Applications for Plant Biology	\$4,044,134	\$350,000
NSF 8/14-4/17	B. Jenny, H. Jenny, and E. Zhang	Digital Generation and Cognitive Evaluation of Flow Maps for Movement Visualization	\$156,630	\$35,360
NSF 6/14-6/15	E. Zhang	Research Experiences for Undergraduates Supplement to Graph and Pattern Design on Surfaces	\$15,000	\$15,000
NIH 5/12-4/16	Y. Di, S. Emerson, E. Zhang, and J. Chang	Negative Binomial Regression and Higher-Order Asymptotic Inference for RNA-Seq Gene Expression Analysis	\$599,611	\$120,329
NSF 9/10-8/11	E. Zhang	Research Experiences for Undergraduates Supplement to Geometric and Topological Analysis of Higher-Order Tensor Fields on Surfaces	\$15,000	\$15,000
NSF 9/10-8/11	E. Zhang	Research Experiences for Undergraduates Supplement to CAREER: Vector and Tensor Field Design for Graphics and Visualization	\$12,000	\$12,000
NSF 8/09-7/15	E. Zhang	Graph and Pattern Design on Surfaces	\$249,976	\$249,976
NSF 6/09-6/10	E. Zhang	Research Experiences for Undergraduates Supplement to Geometric and Topological Analysis of Higher-Order Tensor Fields on Surfaces	\$15,000	\$15,000
NSF 9/08-8/12	E. Zhang	Geometric and Topological Analysis of Higher-Order Tensor Fields on Surfaces	\$374,996	\$374,996

NSF 6/08-6/09	E. Zhang	Research Experiences for Undergraduates Supplement to CAREER: Vector and Tensor Field Design for Graphics and Visualization	\$12,000	\$12,000
NSF 6/06-6/07	E. Zhang	Research Experiences for Undergraduates Supplement to CAREER: Vector and Tensor Field Design for Graphics and Visualization	\$6,000	\$6,000
NSF 2/06-1/12	E. Zhang	Vector and Tensor Field Design for Graphics and Visualization (CAREER award)	\$400,000	\$400,000
<i>Totals</i>			\$6,302,145	\$1,957,459

### **C3.1. Donations**

<i>Year</i>	<i>Source</i>	<i>Donation</i>	<i>Approx Value</i>

### **C3.2. Proposals Currently under Review**

<i>Agency</i>	<i>PI (and coPIs)</i>	<i>Title</i>	<i>Budget</i>	<i>Duration</i>
NSF 9/18-8/22	M. Babbar-Sebens, J. Tilt, E. Zhang, B. Zhao	SCC: Smart and Secure Data Visual Analytics and Communications for Community-Driven Design and Management of Decentralized Practices	\$2,576,833	48 months
NSF 1/19-12/22	E. Zhang and Y. Zhang	SCH: INT: Collaborative Research: Development of a Patient-Centric Modeling Framework for Robust Radiation Treatment Planning with Application to Prostate Cancers	\$600,000	48 months

### **C4. Patents Filed and In Process**

HexMesh US Patent Application No. 13/948016 - OWGM File: U008 0905/TAR - UBC File: UILO 13-039, "Methods and Systems for Generating Polycubes and All-Hexahedral Meshes of an Object".

### **C5. Other Scholarship and Creative Activities**

## D. Service

### D1. University Service

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- CS School Graduate Admission Committee, 2004-present
- EECS School Promotion and Tenure Committee, 2011-present
- EECS School Promotion and Tenure Dossier Committee, 2010-2011, 2013-2014
- CS School Graduate Curriculum Committee, 2012-present
- CS School Hiring Committee, 07/08, 08/09, 10/11, 15/16, 16/17, 17/18
- External member, Hiring Committee of Mathematics, 2010-2011
- External member, Hiring Committee of Geography, 2015-2016
- University Research Council, AY 07/08, 13/14, 14/15, 15/16
- University Committee on Committees, AY 08/09, 09/10, 10/11

### D2. Service to the Profession

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#### D2.1. Journal Editorships

- Associate editor for ACM Transactions on Graphics, 2018-present.
- Associate editor for *Computer Graphics Forum*, 2017-present.
- Associate editor for *Journal of Graphical Models*, 2014-2018.

#### D2.2. Conference and Workshop Organization

- Organizing Committee, NSF Workshop on Integrating Science Needs with Advanced Seafloor Sensor Engineering to Provide Early Warning of Geohazards: Visioning Workshop and Roadmap for the Future
- Organizing Committee, International Conference on Biological Ontology and BioCreative 2018.
- Workshop Co-Organizer, Workshop on Novel Approaches to Visualizing Big Data Sets, 2018, Corvallis, OR.
- Co-organizer of the Dagstuhl Seminar on Visualization and Processing of Anisotropy in Imaging, Geometry, and Astronomy.
- Core Committee, IEEE Visualization 2017.
- Community, Co-Chair, IEEE Visualization 2017.
- Organizing Committee, International Conference on Biological Ontology and BioCreative 2016.
- Workshop Co-Organizer, Workshop on Novel Approaches to Visualizing Big Data Sets, 2016, Corvallis, OR.
- Technical Papers Co-Chair, CAD/Graphics 2013, Hong Kong
- Doctoral Colloquium, Co-Chair, IEEE Visualization 2011.
- Doctoral Colloquium, Co-Chair, IEEE Visualization 2010.

#### D2.3. Conference Program Committees

- ACM SIGGRAPH, 2011, 2012, 2018.
- ACM SIGGRAPH ASIA, 2009, 2016, 2017.



- IEEE Visualization Conference 2007, 2008, 2009, 2012, 2013, 2014, 2018.
- IEEE Shape Modeling International, 2007, 2008, 2010, 2011, 2012, 2013, 2014, 2015, 2017.
- EuroGraphics, 2011, 2012, 2013, 2014, 2015, 2016, 2017.
- EuroVis 2011, 2012, 2013, 2016, 2017.
- Pacific Graphics, 2008, 2009, 2010, 2011, 2014, 2015, 2016, 2017.
- Pacific Visualization, 2010, 2011, 2015, 2016, 2017.
- Symposium on Geometry Processing, 2008, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018.
- International Symposium on Non-Photorealistic Animation and Rendering, 2008, 2010, 2013.
- International Symposium on Visual Computing, 2008, 2009, 2010.
- International Conference on Geometry Modeling and Processing, 2015, 2016, 2017.
- International Conference on Computer Animation and Social Agents, 2008.
- International Conference on Biological Ontologies and BioCreative, 2017.
  
- ACM SIGGRAPH ASIA Briefs and Posters, 2013, 2014, 2015.
- ACM SIGGRAPH ASIA Sketches and Posters, 2008.
- ACM SIGGRAPH Sketches and Posters, 2007.
- EuroGraphics Short Papers, 2014.
  
- Workshop on Topological Methods in Data Analysis and Visualization, 2009, 2011, 2013, 2015, 2017.
- Workshop on Knowledge-assisted Visualization, 2008.
- International Workshop on Super Visualization, 2008.
  
- Session Chair, ACM SIGGRAPH, 2018 (Fields and Remeshing)
- Session Chair, ACM SIGGRAPH, 2012 (Maps, Surfaces, and Shapes).
- Session Chair, ACM SIGGRAPH, 2011 (Surfaces).
- Session Chair, ACM SIGGRAPH ASIA, 2017 (Learning Geometry).
- Session Chair, ACM SIGGRAPH ASIA, 2016 (Parameterization and Remeshing).
- Session Chair, ACM SIGGRAPH ASIA 2016 Symposium on Visualization (Vectors and Tensors).
- Session Chair, ACM SIGGRAPH ASIA, 2009 (3D is fun).
- Session Chair, EuroGraphics, 2013 (Shape Correspondence).
- Session Chair, EuroGraphics, 2012 (Computational Geometry and Geometry Processing).
- Session Chair, IEEE Visualization Conference, 2013 (Vector and Flow Visualization).
- Session Chair, IEEE Visualization Conference, 2012 (Flow and Turbulence).
- Session Chair, IEEE Visualization Conference, 2009 (Particle Systems and Flow Visualization).
- Session Chair, IEEE Visualization Conference, 2008 (Flow Visualization).
- Session Chair, EuroVis, 2013 (Graphs).

#### **D2.4. Reviewing**

- NSF Grant Review Panels
- *ACM Transaction on Graphics*
- *ACM SIGGRAPH*

- *ACM SIGGRAPH ASIA*
- *Eurographics*
- *IEEE Visualization Conference*
- *IEEE Transactions on Visualization and Computer Graphics*
- *EuroVis*
- *Computer Graphics Forum*
- *Computers and Graphics*
- *International Journal of Human and Computer Studies*
- *IEEE Transactions on Circuits and Systems for Video Technology*
- *Visual Computer*
- *Computer Graphics and Applications*
- *Graphics Interfaces*
- *Journal of Zhejiang University Science A*
- *International Symposium on Computer and Information Sciences*
- *International Symposium on Visual Computing*
- *Pacific Graphics*
- *Pacific Visualization*
- *Symposium on Computer Animation*
- *IEEE Transactions on Multimedia*
- *European Journal of Applied Mathematics*
- *SIGCHI/UIST*
- *Journal of Water Resources Planning and Management*
- *Journal of Applied Mathematics and Mechanics*

### **D2.5. Other**

## **D3. Service to the Public**

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### **D3.1. Professionally Related**

- Career Day Demonstration at Waldport High School in April 2008

### **D3.2. Other Public Service**

- Camp Consular, Visualization Summer Camp for Junior Faculty Members, 2016

## **E. Awards**

National Science Foundation Faculty Early Career Development (CAREER) Award, 2006.

Senior Member of the ACM, 2011.

Senior Member of the IEEE, 2011.

Keynote Speaker, Computer Graphics Taiwan, 2016.