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Xifeng Gao

Research Interests

Geometry Computing and Optimization for applications in Computer Graphics, Digital Fabrication, and Image Processing.

Current Occupation

Aug./18–current **Assistant Professor**

- Department of Computer Science, Florida State University

Education

Aug./16–Jul./18 **Postdoctoral Associate, Courant Institute of Mathematical Sciences, New York University**

⋆ Host: Prof. Daniele Panozzo,
⋆ Research topic: Mesh Generation and Simulation.

Sep./11–May/16 **Ph.D., Department of Computer Science, University of Houston**

⋆ Computer Graphics & Interactive MediaLab (Prof. Zhigang Deng),
⋆ Data Visualization & Modeling Lab (Prof. Guoning Chen),
⋆ Thesis topic: Towards High Quality Hexahedral Meshes: Generation, Optimization, and Evaluation,
⋆ GPA: 3.916/4.0.

Sep./08–Jun./11 **M.Sc., Department of Computer Science and Technology, Shandong University**

⋆ Geometric Design and Information Visualization Lab (Prof. Caiming Zhang),
⋆ Thesis topic: 3D Model Watermarking Techniques Based on Geometry Invariants,
⋆ GPA: 85.36/100, top 10 (139 in total).

Sep./04–Jun./08 **B.Sc., Department of Computer Science and Technology, Shandong University**

⋆ Thesis topic: Implementations of Blind Robust Watermarking Schemes for Copyright Protection of 3D Mesh Objects (Advised by Prof. Xingqiang Yang),
⋆ GPA: 88.38/100, top 5 (182 in total).

Honors And Awards

2016 Best PhD Thesis Award (University of Houston)
2016 PhD Showcase Award, First Place (University of Houston)
2015 Best PhD Student Award (University of Houston)
2013,2014 NSMAA scholarship (University of Houston)
2013 Best Junior PhD Student Award (University of Houston)
2008 National Graduate Contest in Mathematical Modeling, First Place (China)
2005-2007, 2010 Outstanding Student Scholarship (Shandong University)
2008 Research Innovation Scholarship (Shandong University)
2007 Postgraduate Recommendation (Government-supported and Examination Waived)
2007 NEC-JAVA Program Design Contest, Third Place (Shandong University)
Sep./06–Apr./08 Project Funded Innovative Training Program for The State College Students (China)
Mar./06–Mar./07 Science and Technology Innovation Fund (Shandong University)

Academic Experiences

Aug./16–Jul./18 **Postdoc, New York University**

⋆ Host: Prof. Daniele Panozzo

Jun./16–Jul./16 **Visiting Scholar, Zhejiang University**

⋆ Host: Prof. Jin Huang

May/16–Jun./16 **Research Assistant, University of Houston**

⋆ Host: Prof. Zhigang Deng

Jun./15–May/16 **Research Assistant, University of Houston**

⋆ Supervisor: Prof. Guoning Chen and Prof. Zhigang Deng

Aug./15–Dec./15 **Visiting Student, Computer Graphics Lab, Hong Kong University**

⋆ Host: Prof. Wenping Wang

Teaching Experiences

May/03/2017 **Guest Lecture, New York University**

⋆ Course: Geometry Processing

⋆ Title: Robust Field-Aligned Quad-Dominant Meshing

Sep./11–Jun./15 **Teaching Assistant, University of Houston**

⋆ Courses: 1) *Topics in Computer Science-Medical Imaging*, 2) *Topics in Computer Science-Cyber Physical Systems*, 3) *Computer Architecture*, 4) *Introduction to Automata and Computability*, 5) *Computer Graphics*, and 6) *Intro Computer Science II (C++, JAVA)*

Sep./09–Jun./11 **Teaching Assistant, Shandong University**

⋆ Course: Computer Graphics

Publications

Under Review

[1] Teseo Schneider, Jeremie Dumas, **Xifeng Gao**, Mario Botsch, Denis Zorin, Daniele Panozzo. "Poly-Spline Finite Element Method", *ACM Transactions on Graphics*, 10 pages.

Journals and Conferences

[1] Yixin Hu, Qingnan Zhou, **Xifeng Gao**, Alec Jacobson, Denis Zorin, Daniele Panozzo. "Tetrahedral Meshing in the Wild", *ACM Transactions on Graphics* (SIGGRAPH 2018), 14 pages.

[2] Kui Wu, **Xifeng Gao**, Zachary Ferguson, Daniele Panozzo, Cem Yuksel. "Stitch Meshing", *ACM Transactions on Graphics* (SIGGRAPH 2018), 12 pages.

[3] **Xifeng Gao**, Daniele Panozzo, Wenping Wang, Zhigang Deng, Guoning Chen. "Robust Structure Simplification for Hex Re-meshing", *ACM Transactions on Graphics* (SIGGRAPH ASIA 2017), 36, 6, pages 185:1–185:13, Article 185 (Nov. 2017), 13 pages.

[4] **Xifeng Gao**, Jin Huang, Kaoji Xu, Zherong Pan, Zhigang Deng, Guoning Chen. "Evaluating Hex-mesh Quality Metrics via Correlation Analysis", *Computer Graphics Forum* 36, 5, (SGP 2017), 12 pages.

[5] Kaoji Xu, **Xifeng Gao**, Guoning Chen. "Hexahedral Mesh Quality Improvement via Edge-angle Optimization", *Computer & Graphics (CAD/Graphics 2017)*, 12 pages.

[6] **Xifeng Gao**, Marco Tarini, Wenzel Jacob, Daniele Panozzo. "Robust Hex-Dominant Mesh Generation using Field-Guided Polyhedral Agglomeration", *ACM Transactions on Graphics* (SIGGRAPH 2017), 36, 4, Article 114 (July 2017), 13 pages.

[7] Kaoji Xu, **Xifeng Gao**, Zhigang Deng, and Guoning Chen. "Hexahedral Meshing with Varying Element Sizes", *Computer Graphics Forum*, (April 2017), 13 pages.

[8] Yongxia Zhang, Xuemei Li, **Xifeng Gao**, and Caiming Zhang. "A Simple Algorithm of Superpixel Segmentation with Boundary Constraint", *IEEE Transactions on Circuits and Systems for Video Technology*, 27, 7, pages 1502–1514 (July 2017), 13 pages.

[9] Wenqian Deng, Xuemei Li, **Xifeng Gao**, and Caiming Zhang. "A Modified Fuzzy C-means Algorithm for Brain MR Image Segmentation and Bias Field Correction", *Journal of Computer Science and Technology*,31, 3, pages 501–511, (May 2016), 11 pages.

[10] **Xifeng Gao**, Tobias Martin, Sai Deng, Elaine Cohen, Zhigang Deng and Guoning Chen. "Structured Volume Decomposition via Generalized Sweeping", *IEEE Transactions on Visualization and Computer Graphics (TVCG)*, 22, 7, pages 1899–1911, (July 2016), 13 pages.

[11] **Xifeng Gao**, and Guoning Chen. "A Local Frame based Hexahedral Mesh Optimization", *25th International Meshing Roundtable, research note*, September, 2016, 5 pages.

[12] **Xifeng Gao**, Zhigang Deng and Guoning Chen. "Hexahedral Mesh Re-parameterization from Aligned Base Domains", *ACM Transactions on Graphics* (*ACM SIGGRAPH 2015*), 34, 4, pages 142:1–142:10, (August 2015), 10 pages.

[13] **Xifeng Gao**, Jin Huang, Siwang Li, Zhigang Deng, Guoning Chen. "An Evaluation of The Quality of Hexahedral Meshes via Modal Analysis", *The First International Workshop on Hex-Meshing: Theory, Applications, and Evaluation*, July, 2014, 6 pages.

[14] **Xifeng Gao**, Caiming Zhang, Yan Huang, and Zhigang Deng. "A Robust High Capacity Affine-Transformation-Invariant Scheme for Watermarking 3D Geometric Models", *ACM Transactions on Multimedia Computing, Communications and Applications (TOMCCAP)*, 8, 34:1–43:21, (September 2012), 21 pages.

[15] **Xifeng Gao**, Nikhil V. Navkar, Nikolaos V. Tsekos and Zhigang Deng. "Intraoperative Registration of Preoperative 4D Cardiac Anatomy with Real-time MR Images", *IEEE 12th International Conference on BioInformatics and BioEngineering (BIBE'12)*, pp. 583-588, September, 2012, 5 pages.

[16] **Xifeng Gao**, Caiming Zhang, Yan Huang, Xia Hu, and Anping Zhu. "Similarity-Transformation Invariant Reversible Watermarking Method for 3D Models", *the Springer Lecture Notes on Electrical Engineering*, 62, pages 277-282, (August 2010), 6 pages.

[17] **Xifeng Gao**, Caiming Zhang, Yu Wei, and Weitao Li. "A Highly Adaptable Capacity and Invisibility 3D Watermarking Based on Four-Points Sets", *The 12th ACM Multimedia and Security Workshop (MM&Sec'10)*, pp. 137-146, 2010, 10 pages.

[18] Anping Zhu, Caiming Zhang, Xingqiang Yang, and **Xifeng Gao**. "Reversible Watermarking of 3D Mesh Models Using Prediction-error Expansion", *The 3rd International Congress on Image and Signal Processing (CISP'10)*, vol. 3, pp. 1171-1175, 2010, 5 pages.

[19] Huamin Ji, Caiming Zhang, Xingqiang Yang, and **Xifeng Gao**. "Watermarking Three-Dimensional Polygonal Models", *The 3rd International Congress on Image and Signal Processing (CISP'10)*, vol. 8, pp. 3899-3903, 2010, 5 pages.

[20] Xia Hu, Caiming Zhang, Wei Wang, and **Xifeng Gao**, "Disparity Adjustment for Local Stereo Matching", *International Symposium on Frontier of Computer Science, Engineering and Applications (CSEA'10)*, pp. 1388-1392, 2010, 5 pages.

Patent

- "A Similarity-Transformation Invariant Reversible Watermarking Method and Equipment for 3D Models", June 11, 2014, No. CN102339456 B (in Chinese).

Invited Talks

Jul./12/2018 Peiking University of Technology, Beijing, China,
Tetrahedralization in the Wild.

Jul./11/2018 Shandong University, Qingdao, China,
Tetrahedralization in the Wild.

Jul./06/2018 Geometric Design Colloquim, Hefei, China,
Stitch Meshing.

Jul./05/2018 University of Science and Technology of China, Hefei, China,

Robust Mesh Generation and Applications to Geometry Processing.
Apri./03/2018 Peking University, Beijing, China,

Robust Meshing.
Feb./20/2018 Florida state University, Tallahassee, US,

Robust Volumetric Meshing.
Feb./15/2018 University of Montreal, Montreal, Canada,

Robust Volumetric Meshing.
Nov./28/2017 SIGGRAPH ASIA, Bangkok, Thailand,

Robust Structure Simplification for Hex Re-meshing.
Nov./25/2017 Shandong University, Jinan, China,

Robust Structure Simplification for Hex Re-meshing.
Nov./24/2017 Peking University, Beijing, China,

Robust Hexahedral and Hex-dominant Meshing.
Nov./23/2017 Microsoft Asia Research, Beijing, China,

Robust Structure Simplification for Hex Re-meshing.
Aug./24/2017 Brigham Young University, Provo, US,

Robust Hexahedral and Hex-dominant Meshing.
Aug./22/2017 University of Utah, Salt Lake City, US,

Robust Hexahedral and Hex-dominant Meshing.
Aug./02/2017 SIGGRAPH, Los Angeles, US,

Robust Hex-Dominant Mesh Generation using Field-Guided Polyhedral Agglomeration.
July/11/2017 SIAM/GD, Pittsburgh, US,

Robust Hex-Dominant Mesh Generation using Field-Guided Polyhedral Agglomeration.
Mar./08/2016 New York University, New York, US,

Towards High Quality Hex-meshing: Generation, Optimization, and Evaluation.
Aug./13/2015 SIGGRAPH, Los Angeles, US,

Hexahedral Mesh Re-parameterization from Aligned Base-Complex.
July/09/2015 Shandong University, China,

Generation and Optimization of Hexahedral Meshes.
Apr./15/2014 Computer Animation and Social Agents (CASA), Houston, US,

An Evaluation of The Quality of Hexahedral Meshes via Modal Analysis.

Academic Services

Volunteer SIGGRAPH, 2013

Associate Editor TVCJ, 2018 -

PC Member CVM, 2019
GMP, 2019
PG, 2018
SGP, 2018
SMI, 2018
Reproducibility Stamp, 2017-2019
SIBGRAPI, 2017
ICVRV, 2017

Reviewer SIGGRAPH, 2016, 2018
Eurographics, 2018
EuroVis, 2017
Pacific Graphics, 2015–2017
CAGD, 2015–2017

Computer Animation and Social Agents (CASA), 2014–2016

IEEE PAMI, 2016
IEEE TIP, 2013
IEEE Transactions on Human-Machine Systems, 2015–2017
CGF, 2017
Computer Animation and Virtual Worlds, 2017
Graphical Models, 2018
The Visual Computer, 2017
Journal of Motor Behavior, 2015–2017
KSII Transactions on Internet and Information Systems, 2017