Kai Xu

PERSONAL INFORMATION	*Position:* Associate Professor	*Citizenship:* P. R. China
	Date of Birth: Oct. 26, 1982	*Place of Birth:* Hohhot, P. R. China

CONTACT INFORMATION	School of Computer Science	*Cellphone:* +86-186-7335-8686
	National University of Defense Technology	*Fax:* +86-731-8457-5802
	47 Yanwachi Street, Kaifu District	*E-mail:* kevin.kai.xu@gmail.com
	Changsha, Hunan 410073 P. R. CHINA	*WWW:* www.kevinkaixu.net

RESEARCH INTERESTS

Computer graphics, geometry processing, geometric modeling and computer vision.

EDUCATION

National University of Defense Technology, Changsha, Hunan, China

Ph.D., School of Computer Science, June, 2011.

- Dissertation: "Semantics Driven 3D Shape Analysis and Modeling".
- Advisor: Yueshan Xiong.

Master, School of Computer Science, December, 2005.

Bachelor, School of Computer Science, July, 2004.

Simon Fraser University, Vancouver, BC, Canada

Visiting Student, School of Computer Science, November, 2009 - October, 2010

- Advisor: Hao (Richard) Zhang.

EMPLOYMENT

Princeton University, Princeton, NJ, USA

Research Scientist, Department of Computer Science   **2017 - present**

National University of Defense Technology, Changsha, Hunan, CHINA

Associate Professor, School of Computer Science   **2011 - present**

Shenzhen Institutes of Advanced Technology, Shenzhen, Guangdong, CHINA

Postdoctoral Researcher, working with Prof. Baoquan Chen   **2012 - 2014**

PROFESSIONAL MEMBERSHIP

ACM Senior Member

CCF (China Computer Federation) Senior Member

HONORS AND GRANDS

- National Science Fund for Excellent Young Scholars, National Science Foundation of China (NSFC), 2016.
- Natural Science Award of Hunan Province (1st place, 3rd contributor), Hunan Province, China, 2014.

- Young Researcher Award of Geometric Design and Computing (GDC), GDC Technical Committee of CSIAM, 2016.

- LU Zengyong High-tech Award on CAD&CG (2nd place), China, 2013

- Excellent Ph.D Dissertation Award, PLA of China, 2013.

REFEREED
JOURNAL
PUBLICATIONS

1. S. Dong, **K. Xu***, Q. Zhou, A. Tagliasacchi, S. Xin, M. Niener, and B. Chen, "Multi-Robot Collaborative Dense Scene Reconstruction," *ACM Trans. on Graphics (SIGGRAPH 2019)*, Vol. 38, No. 4, 2019. (*** corresponding author**)

2. M. Li, A. G. Patil, **K. Xu***, S. Chaudhuri, O. Khan, A. Shamir, C. Tu, B. Chen, D. Cohen-Or, and H. Zhang, "GRAINS: Generative Recursive Autoencoders for INdoor Scenes," *ACM Transactions on Graphics (Presented at SIGGRAPH 2019)*, Vol. 38, No. 2, 2019. (*** corresponding author**)

3. C. Zhu, **K. Xu***, S. Chaudhuri, R. Yi, and H. Zhang, "SCORES: Shape Composition with Recursive Substructure Priors," *ACM Trans. on Graphics (SIGGRAPH Asia 2018)*, Vol. 37, No. 6, 2018. (*** corresponding author**)

4. X. Wang, B. Zhou, H. Fang, X. Chen, Q. Zhao, and **K. Xu***, "Learning to Group and Label Fine-Grained Shape Components," *ACM Trans. on Graphics (SIGGRAPH Asia 2018)*, Vol. 37, No. 6, 2018. (*** corresponding author**)

5. **K. Xu***, L. Zheng*, Z. Yan, G. Yan, E. Zhang, M. Niessner, O. Deussen, D. Cohen-Or, H. Huang, "Autonomous Reconstruction of Unknown Indoor Scenes Guided by Time-varying Tensor Fields," *ACM Trans. on Graphics (SIGGRAPH Asia 2017)*, Vol. 36, No. 6, 2017. (*** joint first author**)

6. J. Li, **K. Xu***, S. Chaudhuri, M. E. Yumer, H. Zhang, L. Guibas, "GRASS: Generative Recursive Autoencoders for Shape Structures," *ACM Trans. on Graphics (SIGGRAPH 2017)*, Vol. 36, No. 4, 2017. (*** corresponding author**, **Featured ACM SIGGRAPH Press Release**)

7. F. Yu, Y. Zhang, **K. Xu***, Z. Sun, H. Zhang, "Semi-Supervised Co-Analysis of 3D Shape Styles from Projected Lines," *ACM Trans. on Graphics (presented at SIGGRAPH 2018)*, Vol. 37, No. 2, 2018. (*** corresponding author**)

8. X. Xia, H. Sun, **K. Xu**, H. Huang, L. Liu, "Object-Aware Guidance for Autonomous Scene Reconstruction," *ACM Trans. on Graphics (SIGGRAPH 2018)*, Vol. 37, No. 4, 2018.

9. K. Xie, H. Huang, D. Lischinski, **K. Xu**, M. Gong, M. Christie, D. Cohen-Or, "Creating and Chaining Camera Moves for Quadrotor Videography," *ACM Trans. on Graphics (SIGGRAPH 2018)*, Vol. 37, No. 4, 2018.

10. C. Zhu, R. Yi, W. Lira, I. Alhashim, **K. Xu**, H. Zhang, "Shape Correspondence via Visual Shape Comparison," *ACM Trans. on Graphics (SIGGRAPH 2017)*, Vol. 36, No. 4, 2017.

11. **K. Xu**, Y. Shi, L. Zheng, J. Zhang, M. Liu, H. Huang, H. Su, D. Cohen-Or and B. Chen, "3D Attention-Driven Depth Acquisition for Object Identification," *ACM Trans. on Graphics (SIGGRAPH Asia 2016)*, Vol. 35, No. 6, 2016.

12. **K. Xu**, H. Huang, Y. Shi, H. Li, P. Long, J. Caichen, W. Sun and B. Chen, "Autoscanning for Coupled Scene Reconstruction and Proactive Object Analysis," *ACM Trans. on Graphics (SIGGRAPH Asia 2015)*, Vol. 34, No. 6, 2015.

13. I. Alhashim, **K. Xu**, Y. Zhuang, J. Cao, P. Simari and H. Zhang, "Deformation-Driven Topology-Varying 3D Shape Correspondence," *ACM Trans. on Graphics (SIGGRAPH Asia 2015)*, Vol. 34, No. 6, 2015.

14. **K. Xu**, R. Ma, H. Zhang, C. Zhu, A. Shamir, D. Cohen-Or and H. Huang, "Organizing Hetero-

geneous Scene Collections through Contextual Focal Points," *ACM Trans. on Graphics (SIG-GRAPH 2014)*, Vol. 33, No. 4, 2014.

15. I. Alhashim, H. Li, **K. Xu**, J. Cao, R. Ma and H. Zhang, "Topology-Varying 3D Shape Creation via Structural Blending," *ACM Trans. on Graphics (SIGGRAPH 2014)*, Vol. 33, No. 4, 2014.

16. H. Zhang, **K. Xu***, W. Jiang, J. Lin, D. Cohen-Or, and B. Chen, "Layered Analysis of Irregular Facades via Symmetry Maximization," *ACM Trans. on Graphics (SIGGRAPH 2013)*, Vol. 32, No. 4, 2013. (*** corresponding author**)

17. O. van Kaick, **K. Xu**, H. Zhang, Y. Wang, S. Sun, A. Shamir, and D. Cohen-Or, "Co-Hierarchical Analysis of Shape Structures," *ACM Trans. on Graphics (SIGGRAPH 2013)*, Vol. 32, No. 4, 2013.

18. **K. Xu**, H. Zhang, W. Jiang, R. Dyer, Z. Cheng, L. Liu and B. Chen, "Multi-Scale Partial Intrinsic Symmetry Detection," *ACM Trans. on Graphics (SIGGRAPH Asia 2012)*, Vol. 31, No. 6, 2012.

19. **K. Xu**, H. Zhang, D. Cohen-Or, and B. Chen, "Fit and Diverse: Set Evolution for Inspiring 3D Shape Galleries," *ACM Trans. on Graphics (SIGGRAPH 2012)*, Vol. 31, No. 4, 2012.

20. **K. Xu**, H. Zheng, H. Zhang, D. Cohen-Or, L. Liu, and Y. Xiong, "Photo-Inspired Model-Driven 3D Object Modeling," *ACM Trans. on Graphics (SIGGRAPH 2011)*, Vol. 30, No. 4, 2011.

21. **K. Xu**, H. Li, H. Zhang, D. Cohen-Or, Y. Xiong, and Z.-Q. Cheng, "Style-Content Separation by Anisotropic Part Scales," *ACM Trans. on Graphics (SIGGRAPH Asia 2010)*, Vol. 29, No. 5, 2010.

22. **K. Xu**, H. Zhang, A. Tagliasacchi, L. Liu, G. Li, M. Meng, and Y. Xiong, "Partial Intrinsic Reflectional Symmetry of 3D Shapes," *ACM Trans. on Graphics (SIGGRAPH Asia 2009)*, Vol. 28, No. 5, 2009.

23. **K. Xu**, D. Cohen-Or, T. Ju, L. Liu, H. Zhang, and S. Zhou, "Feature-Aligned Shape Texturing," *ACM Trans. on Graphics (SIGGRAPH Asia 2009)*, Vol. 28, No. 5, 2009.

24. S. Chen, L. Zheng, Y. Zhang, Z. Sun, and **K. Xu**, "VERAM: View-Enhanced Recurrent Attention Model for 3D Shape Classification," *IEEE Transactions on Visualization and Computer Graphics*, to appear, 2018.

25. J. Wang and **K. Xu**, "Shape Detection from Raw LiDAR Data with Subspace Modeling," *IEEE Transactions on Visualization and Computer Graphics (TVCG)*, to appear, 2016.

26. B. Leng, C. Zhang, X. Zhou, C. Xu, and **K. Xu**, "Learning Discriminative 3D Shape Representations by View Discerning Networks," *IEEE Transactions on Visualization and Computer Graphics*, to appear, 2018.

27. Y. Zhao, **K. Xu**, X. Liu, E. Zhu, X. Zhu and J. Yin, "Triangle Lasso for Simultaneous Clustering and Optimization in Graph Datasets," *IEEE Transactions on Knowledge and Data Engineering*, to appear, 2018.

28. **K. Xu**, V. G. Kim, Q. Huang, and E. Kalogeraki, "Data-Driven Shape Analysis and Processing," *Computer Graphics Forum (Eurographics 2016 STAR Report)*, 2016.

29. L. Zheng, C. Zhu, J. Zhang, H. Zhao, H. Huang, M. Niessner, and **K. Xu***, "Active Scene Understanding via Online Semantic Reconstruction," *Computer Graphics Forum (Pacific Graphics 2019)*, Vol. 38, No. 7, 2019.

30. O. Remil, Q. Xie, X. Xie, **K. Xu**, and J. Wang, "Data-Driven Sparse Priors of 3D Shapes," *Computer Graphics Forum (Pacific Graphics 2017)*, Vol. 36, No. 7, 2017.

31. Q. Wu, **K. Xu**, and J. Wang, "Reconstructing 3D CSG Models from 3D Raw Point Clouds," *Computer Graphics Forum (SGP 2018)*, Vol. 37, No. 5, 2018.

32. O. Remil, Q. Xie, X. Xie, **K. Xu**, and J. Wang, "Surface Reconstruction with Data-driven Exemplar Priors," *Computer-Aided Design*, Vol. 88, No. C, 2017.

33. Q. Yuan, G. Li, **K. Xu**, and H. Huang, "Space-Time Co-Segmentation of Point Cloud Sequences," *Computer Graphics Forum (Eurographics 2016)*, Vol. 35, No. 2, 2016.

34. X. Guo, J. Lin, **K. Xu**, S. Chaudhuri and X. Jin, "CustomCut: On-demand Extraction of Customized 3D Parts with 2D Sketches," *Computer Graphics Forum (SGP 2016)*, Vol. 35, No. 5, 2016.

35. H. Li, G. Wan, H. Li, A. Sharf, **K. Xu** and B. Chen , "Mobility Fitting using 4D RANSAC," *Computer Graphics Forum (SGP 2016)*, Vol. 35, No. 5, 2016.

36. Z. Xie, **K. Xu***, W. Shan, L. Liu, Y. Xiong and H. Huang, "Projective Feature Learning for 3D Shapes with Multi-View Depth Images," *Computer Graphics Forum (Pacific Graphics 2015)*, Vol. 34, No. 6, 2015.

37. Q. Zheng, Z. Hao, H. Huang, **K. Xu**, H. Zhang, D. Cohen-Or and B. Chen, "Skeleton-Intrinsic Symmetrization of Shapes," *Computer Graphics Forum (Eurographics 2015)*, Vol. 34, No. 2, 2015.

38. Z. Xie, **K. Xu***, L. Liu and Y. Xiong, "3D Shape Segmentation and Labeling via Extreme Learning Machine," *Computer Graphics Forum (SGP 2014)*, Vol. 33, No. 5, 2014.

39. J. Wang, **K. Xu**, L. Liu, J. Cao, S. Liu and X. Gu, "Consolidation of Low-quality Point Clouds from Outdoor Scenes," *Computer Graphics Forum (SGP 2013)*, Vol. 32, No. 5, 2013.

40. Y. Shi, P. Long, **K. Xu***, H. Huang and Y. Xiong, "Data-Driven Contextual Modeling for 3D Scene Understanding," *Computers and Graphics*, Vol. 55, 2016.

41. B. Wu, **K. Xu***, Y. Zhou, Y. Xiong and H. Huang, "Skeleton-Guided 3D Shape Distance Field Metamorphosis," *Graphical Models*, Vol. 85, 2016.

42. Y. Wang, Z. Xie, **K. Xu**, Y. Dou and Y. Lei, "An Efficient and Effective Convolutional Auto-Encoder Extreme Learning Machine Network for 3D Feature Learning," *Neurocomputing*, Vol. 174, 2016.

43. Z. Xie, Y. Xiong and **K. Xu***, "AB3D: Action-Based 3D Descriptor for Shape Analysis," *The Visual Computer (CGI 2014)*, Vol. 30, No. 6-8, 2014.

44. X. Guo, J. Lin, **K. Xu** and X. Jin, "Creature Grammar for Creative Modeling of 3D Monsters," *Graphical Models (GMP 2014)*, Vol. 76, No. 5, 2014.

45. J. Li, W. Xu, Z. Cheng, **K. Xu*** and R. Klein, "Lightweight Wrinkle Synthesis for 3D Facial Modeling and Animation," *Computer-Aided Design (SPM 2014)*, Vol. 58, 2014.

46. Y. Chen, G. Dang, Z. Cheng and **K. Xu***, "Fast capture of personalized avatar using two Kinects," *Journal of Manufacturing Systems*, Vol. 33, No. 1, 2014.

47. X. Xie, **K. Xu**, N. Mitra, D. Cohen-Or and B. Chen, "Sketch-to-Design: Context-based Part Assembly," *Computer Graphics Forum*, Vol. 32, No. 8, 2013.

48. W. Jiang, **K. Xu***, Z. Cheng, and H. Zhang, "Skeleton-Based Intrinsic Symmetry Detection on Point Clouds," *Graphical Models*, Vol. 75, No. 4, 2013.

49. W. Jiang, **K. Xu***, Z. Cheng, R. Martin, and G. Dang, "Curve Skeleton Extraction by Coupled Graph Contraction and Surface Clustering," *Graphical Models*, Vol. 75, No. 3, 2013.

50. Y. Wang, Y. Xiong, **K. Xu**, and D. Liu, "vKASS: A Surgical Procedure Simulation System for Arthroscopic Anterior Cruciate Ligament Reconstruction", *Computer Animation and Virtual Worlds*, vol. 24, No. 1, 2013.

51. Y. Wang, **K. Xu**, J. Li, H. Zhang, A. Shamir, L. Liu, Z. Cheng and Y. Xiong, "Symmetry Hierarchy of Man-Made Objects", *Computer Graphics Forum (Eurographics 2011)*, Vol. 30, No. 2, 2011.

52. **K. Xu**, H. Zhang, D. Cohen-Or and Y. Xiong, "Dynamic Harmonic Fields for Surface Processing," *Computers and Graphics (SMI 2009)*, Vol. 33, No. 3, 2009.

53. **K. Xu**, Z. Cheng, Y. Z. Wang, Y. Xiong and H. Zhang, "Quality Encoding for Tetrahedral Mesh Optimization," *Computers and Graphics (SMI 2009)*, Vol. 33, No. 3, 2009.

54. Y. Wang, **K. Xu**, Y. Xiong and Z. Cheng, "2D Shape Deformation Based on As-Rigid-As-Possible Squares Matching", *Computer Animation and Virtual Worlds (CASA 2008)*, Vol. 19, No. 3-4, 2009.

55. Y. Zhang, K. Lu, Y. Gao, **K. Xu**, "A Novel Quantum Representation for Log-Polar Images," *Quantum Information Processing*, Vol. 12, No. 9, 2013.

56. Y. Zhang, K. Lu, **K. Xu**, Y. Gao, R. Wilson, "Local Feature Point Extraction for Quantum Images," *Quantum Information Processing*, Vol. 14, No. 5, 2015.

REFEREED CONFERENCE PUBLICATIONS

1. M. Halber, Y. Shi, **K. Xu***, and T. Funkhouser, "RESCAN: Inductive Instance Segmentation for Indoor RGBD Scans," in *Proc. of ICCV 2019*.

2. Y. Shi, A. Chang, M. Savva, Z. Wu, and **K. Xu***, "Hierarchy Denoising Recursive Autoencoders for 3D Scene Layout Prediction," in *Proc. of CVPR 2019*.

3. X. Wang, Y. Shi, B. Zhou, X. Chen, Q. Zhao, and **K. Xu***, "Shape2Motion: Joint Analysis of Motion Parts and Attributes from 3D Shapes," in *Proc. of CVPR 2019*, Oral presentation.

4. F. Yu, K. Liu, Y. Zhang, C. Zhu, and **K. Xu***, "PartNet: A Recursive Part Decomposition Network for Fine-grained and Hierarchical Shape Segmentation," in *Proc. of CVPR 2019*.

5. M. Liu, Z. Pan, **K. Xu***, K. Ganguly, and D. Manocha, "Generating Grasp Poses for a High-DOF Gripper Using Neural Networks," in *Proc. of IROS 2019*.

6. Y. Shi, **K. Xu***, M. Niessner, S. Rusinkiewicz and T. Funkhouser, "PlaneMatch: Patch Coplanarity Prediction for Robust RGB-D Reconstruction," in *Proc. of ECCV 2018*, Oral presentation (Acceptance rate: 1.9%).

7. C. Niu, J. Li, **K. Xu***, "Im2Struct: Recovering 3D Shape Structure from a Single RGB Image," in *Proc. of CVPR 2018*.

8. Q. She, Y. Gao, **K. Xu**, R. Chan, "Reduced-Rank Linear Dynamical System," in *Proc. of AAAI Conference on Artificial Intelligence (AAAI)*, 2018.

9. J. Liu, S. Xin, Z. Gao, **K. Xu**, C. Tu, B. Chen, "Caging Loops in Shape Embedding Space: Theory and Computation," in *Proc. of International Conference on Robotics and Automation (ICRA)*, 2018.

10. K. Lu, Y. Zhang, **K. Xu**, Y. Gao and R. Wilson, "Approximate Maximum Common Sub-graph Isomorphism Based on Discrete-Time Quantum Walk," in *Proc. of ICPR*, 2014.

11. W. Jiang, **K. Xu**, Z. Cheng, R. Martin and G. Dang, "Curve Skeleton Extraction by Coupled Graph Contraction and Surface Clustering," in *Computational Visual Media Conference*, 2012

12. **K. Xu**, Y. Xiong, Y. Wang, K. Tan, G. Guo, "A Simple and Stable Feature-Preserving Smoothing Method for Contours-Based Reconstructed Meshes," in *Proc. of ACM GRAPHITE*, 2006.

13. **K. Xu**, Y. Wang, Y. Xiong, Z.-Q. Cheng, "Interactive Shape Manipulation Based on Space Deformation with Harmonic-Guided Clustering," in *Proc. of International Conference on Computer Animation and Social Agent (CASA)*, short paper, 2008.

14. Z.-Q. Cheng, **K. Xu**, B. Li, Y. Wang, S.-Y. Jin, G. Dang, "A Mesh Meaningful Segmentation Algorithm Using Skeleton and Minima-Rule," in *Proc. of International Symposium on Visual Computing (ISVC)*, 2007.

15. Y. Wang, Y. Xiong, **K. Xu**, K. Tan, G. Guo, "A Mass-Spring Model for Surface Mesh Deformation Based on Shape Matching," in *Proc. of ACM GRAPHITE*, 2006.

16. Z.-Q. Cheng, B. Li, **K. Xu**, Y. Wang, G. Dang, S.-Y. Jin, "Error-Resilient Arithmetic Coding Algorithm for Compressed Meshes," in *Proc. of CyberWorld (CW)*, 2008.

17. Z.-Q. Cheng, Y. Wang, B. Li, **K. Xu**, G. Dang, S.-Y. Jin, "A Survey of Methods for Moving Least Squares Surfaces," in *IEEE/Eurographics Symposium on Point Based Graphics (PBG)*, 2008.

18. Z.-Q. Cheng, W. Jiang, G. Dang, R. Martin, J. Li, H. Li, Y. Chen, Y. Wang, B. Li, **K. Xu**, S. Jin, "Non-rigid Registration in 3D Implicit Vector Space," in *Proc. of IEEE Int. Conf. on Shape Modeling and Applications (SMI)*, 2010.

COURSES, TUTORIALS, AND INVITED TALKS	• SIGGRAPH Asia Course, "Data-Driven Shape Analysis and Processing", Instructor, with Vladimir Kim, Qixing Huang, Evangelos Kalogerakis and Niloy Mitra, SIGGRAPH Asia 2016, Macao, China, Dec 5, 2016.

- Eurographics STAR Report, "Data-Driven Shape Analysis and Processing", Organizer, with Vladimir Kim, Qixing Huang, and Evangelos Kalogerakis, Eurographics 2016, Lisbon, Portugal, May 13, 2016.

- SIGGRAPH Asia Course, "Data-Driven Visual Computing", Organizer, with Leonidas Guibas, Alexei Efros, Shi-Min Hu, Ariel Shamir, Siddhartha Chaudhuri and Jun-Yan Zhu, SIGGRAPH Asia 2014, Shenzhen, China, Dec 4, 2014.

- Panel Speech, "High-level Shape Understanding", CAD/Graphics 2015, Xi'an, China, June 13, 2013.

- Invited Talk, "2D-3D Fusion for Data-Driven Visual Computing", International Forum on 2D-3D Fusion and HCI, CCF YOCSEL Hangzhou & Hangzhou Normal University, Hangzhou, China, July 5-6, 2014.

PROFESSIONAL SERVICES	**Journal Editorial Board**

- Computer Graphics Forum (IF=1.542), Associate Editor (2016–present).

- Computers and Graphics (IF=1.120), Associate Editor (2014–present).

- The Visual Computer (IF=1.060), Associate Editor (2015–present).

- Frontiers of Computer Science (IF=0.660), Young Associate Editor (2014–present).

Program Co-chair

- CAD/Graphics 2017.

- ICVRV 2017.

- CSIAM GDC 2016.

International Program Committee

- SIGGRAPH Asia: 2017, 2018.

- Eurographics Short Papers: 2013–2016.

- Eurographics Symposium on Geometry Processing (SGP): 2013–2015, 2017.

- Pacific Graphics: 2013–2018.

- Geometric Modeling and Processing (GMP): 2014.

- Shape Modeling International (SMI): 2018

- Computer Graphics International (CGI): 2018

- Eurographics 3DOR workshop: 2017.

- IEEE CAD/Graphics: 2013, 2015.

- Chinagraph: 2014, 2016.

Paper Review for International Conferences

- SIGGRAPH, SIGGRAPH Asia, Eurographics, Pacific Graphics, SGP, etc.

Paper Reviewer of International Journals

- ACM Transactions on Graphics (TOG), IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), IEEE Transactions on Visualization and Computer Graphics (TVCG), ACM Transactions on Applied Perception (TAP), etc.