QIANYI ZHOU

Staff Research Scientist
Intel Labs
3600 Juliette Lane
Santa Clara, CA 95054

Tel: 323-893-9083
http://qianyi.info/
Qianyi.Zhou@gmail.com
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Research Interest

- I have dedicated myself to research in the field of **computer vision** and **computer graphics**. In particular, I tackle the challenges in **3D content creation**. The ultimate goal of my research is to make computers perceive the 3D reality of the physical world, which is the foundation of many important applications such as virtual reality, medical imaging, and autonomous driving.

Current Position

- **Staff Research Scientist** June 2015 to present
  - Intel Visual Computing Lab
  - Manager: Vladlen Koltun

Experience and Education

- Postdoctoral Researcher - Stanford University, CA January 2015
  - Advisor: Vladlen Koltun
- Ph.D. in Computer Science - University of Southern California, CA August 2012
  - Thesis: 3D Urban Modeling from City-scale Aerial LiDAR Data
  - Advisor: Ulrich Neumann
- M.S. in Computer Science - Tsinghua University, Beijing June 2007
  - Thesis: OcTree Based Topology Repair and Editing
  - Advisor: Shi-Min Hu
- B.E. in Computer Science - Tsinghua University, Beijing June 2005

Publications

- **Qian-Yi Zhou**, Jaesik Park, and Vladlen Koltun, "Fast Global Registration", *ECCV 2016 (**oral presentation, acceptance rate 1.8%**)*
- Sungjoon Choi, **Qian-Yi Zhou**, Stephen Miller, and Vladlen Koltun, "A Large Dataset of Object Scans", *Technical Report, arXiv:1602.02481, 2016*
- Sungjoon Choi, **Qian-Yi Zhou**, and Vladlen Koltun, "Robust Reconstruction of Indoor Scenes", *CVPR 2015 (joint first authors)*
- **Qian-Yi Zhou** and Vladlen Koltun, "Depth Camera Tracking With Contour Cues", *CVPR 2015*
- **Qian-Yi Zhou** and Vladlen Koltun, "Color Map Optimization for 3D Reconstruction with Consumer Depth Cameras", *ACM SIGGRAPH 2014*

- **Qian-Yi Zhou** and Vladlen Koltun, "Simultaneous Localization and Calibration: Self-Calibration of Consumer Depth Cameras", *IEEE CVPR 2014*
- Rongqi Qiu, **Qian-Yi Zhou**, and Ulrich Neumann, "Pipe-Run Extraction and Reconstruction from Point Clouds", *ECCV 2014*
- **Qian-Yi Zhou**, Stephen Miller, and Vladlen Koltun, "Elastic Fragments for Dense Scene Reconstruction", *ICCV 2013 (**oral presentation, acceptance rate: 2.5%**)*
- **Qian-Yi Zhou** and Vladlen Koltun, "Dense Scene Reconstruction with Points of Interest", *ACM SIGGRAPH 2013*
- **Qian-Yi Zhou** and Ulrich Neumann, "2.5D Building Modeling by Discovering Global Regularities", *IEEE CVPR 2012*
- **Qian-Yi Zhou** and Ulrich Neumann, "Complete Residential Urban Area Reconstruction from Dense Aerial LiDAR Point Clouds", *Graphical Models 2012*
- **Qian-Yi Zhou** and Ulrich Neumann, "Modeling Residential Urban Areas from Dense Aerial LiDAR Point Clouds", *Computational Visual Media Conference 2012*
- Na Chen, **Qian-Yi Zhou**, and Viktor Prasanna, "Understanding Web Images by Object Relation Network", *WWW 2012*
- **Qian-Yi Zhou** and Ulrich Neumann, "2.5D Building Modeling with Topology Control", *IEEE CVPR 2011*
- **Qian-Yi Zhou** and Ulrich Neumann, "2.5D Dual Contouring: A Robust Approach to Creating Building Models from Aerial LiDAR Point Clouds", *ECCV 2010 (**oral presentation, acceptance rate: 3.3%**)*
- **Qian-Yi Zhou** and Ulrich Neumann, "A Streaming Framework for Seamless Building Reconstruction from Large-Scale Aerial LiDAR Data", *IEEE CVPR 2009*
- **Qian-Yi Zhou** and Ulrich Neumann, "Fast and Extensible Building Modeling from Airborne LiDAR Data", *ACM GIS 2008*
- Tao Ju, **Qian-Yi Zhou**, Michiel van de Panne, Daniel Cohen-Or, and Ulrich Neumann, "Reusable Skinning Templates Using Cage-based Deformations", *ACM SIGGRAPH ASIA 2008*
- Junho Kim, Miao Jin, **Qian-Yi Zhou**, Feng Luo, and Xianfeng Gu, "Computing Fundamental Group of General 3-Manifold", *International Symposium on Visual Computing 2008*
- Tao Ju, **Qian-Yi Zhou**, and Shi-Min Hu, "Editing The Topology of 3D Models by Sketching", *ACM SIGGRAPH 2007*
- **Qian-Yi Zhou**, Tao Ju, and Shi-Min Hu, "Topology Repair of Solid Models Using Skeletons", *IEEE Trans. Vis. Comput. Graph. 2007*
- Yu-Kun Lai, **Qian-Yi Zhou**, Shi-Min Hu, Johannes Wallner, and Helmut Pottmann, "Robust Feature Classification and Editing", *IEEE Trans. Vis. Comput. Graph. 2007*
- Yong-Jin Liu, **Qian-Yi Zhou**, and Shi-Min Hu, "Handling Degenerate Cases in Exact Geodesic Computation on Triangle Meshes", *The Visual Computer 2007*
- Yu-Kun Lai, **Qian-Yi Zhou**, Shi-Min Hu, and Ralph R. Martin, "Feature Sensitive Mesh Segmentation", *ACM Symp. Solid and Physical Modeling 2006*

Systems and Software

- **Fast Global Registration** - 2016
  - A fast global registration algorithm that matches or exceeds the accuracy of state-of-the-art global registration pipelines, while being at least an order of magnitude faster.
  - Code and dataset available at: https://github.com/IntelVCL/FastGlobalRegistration
- **Dense Scene Reconstruction** - 2014 to present
  - The state-of-the-art offline 3D reconstruction system that uses depth cameras to create 3D models of scenes.
  - Many core techniques have been implemented in the impactful industrial software Intel Realsense SDK.
  - Research prototype available at: http://redwood-data.org/indoor/tutorial.html
  - Code available at: https://github.com/qianyizh/ElasticReconstruction
  - Dataset available at: http://qianyi.info/scenedata.html
- **Automatic Urban Modeling System** - 2007 to 2012
  - A fully automatic urban modeling system which creates 3D polygonal models from aerial point cloud.
  - Companies and organizations which have used or tested this system include: Airborne 1 Corp, Sanborn, and many research groups.
- **TopoMender and MendIt** - 2006 to 2007
  - A set of topology noise removal and topology editing tools for 3D models. Freely available (Search "TopoMender" via Google).
  - Companies and organizations which have used or tested this system include: Pacific Northwest National Laboratory, UCLA Laboratory of Neuro-Imaging, and many research groups.

Advising and Mentoring

- **Research Scientist**
  - Arno Knapitsch, Ph.D., Intel Labs, 2016
  - Jaesik Park, Ph.D., Intel Labs, 2016
  - Sridhar Uyyala, M.S., Intel Labs, 2016
- **Student**
  - Marc Khoury, Ph.D. student from Berkeley, Intel Labs, 2016
  - Sungjoon Choi, Ph.D. student, Stanford, 2013 to 2015
  - Tao Du, M.S. student, Stanford, 2013 to 2014
  - Jing Liu, exchange Ph.D. student, Stanford, 2012
  - Rongqi Qiu, Ph.D. student, USC, 2010 to 2014

Professional Service

- **Grant Reviewer**
  - Infocomm Development Authority of Singapore
- **Journal Reviewer**
  - ACM Transactions of Graphics

  - Algorithms
  - Computer Aided Design
  - Computer Aided Geometric Design
  - Computers & Graphics
  - Graphical Models
  - IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing
  - IEEE Transactions on Automation Science and Engineering
  - IEEE Transactions on Circuits and Systems for Video Technology
  - IEEE Transactions on Visualization and Computer Graphics
  - IEEE Transactions on Pattern Analysis and Machine Intelligence
  - ISPRS International Journal of Geo-Information
  - Journal of Computer Science and Technology
  - Remote Sensing
  - Sensors
  - The Visual Computer
- **Conference Reviewer**
  - ACM Solid and Physical Modeling Symposium (ACM SPM)
  - Asian Conference on Computer Vision (ACCV)
  - Computational Visual Media Conference
  - Computer Graphics International
  - ECCV Workshop
  - Eurographics
  - International Conference on 3D Vision (3DV)
  - International Conference on Intelligent Robots and Systems (IROS)
  - International Conference on Pattern Recognition (ICPR)
  - Pacific Graphics
  - SIGGRAPH
  - SIGGRAPH Asia

Selected Awards

- 2007 to 2011 - Provost's Ph.D. Fellowship from University of Southern California
- March 2010 - Winner of "best poster for technical strength" in 2010 annual research review of Computer Science, University of Southern California
- 2007 - Outstanding M.S. thesis, Computer Science, Tsinghua University, Beijing
- 2005 - Outstanding B.E. thesis, Computer Science, Tsinghua University, Beijing
- 2005 - Outstanding Graduate of the Beijing city