

Liangliang Nan

Assistant Professor

Delft University of Technology

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Research Interests

3D Geoinformation, Computer graphics, computer vision, and human-computer interaction, with a practical commitment to developing algorithms and tools for effectively and efficiently acquiring, analyzing, understanding, and modeling real world scenes (outdoor and indoor).

Academic Positions

- 2018.1 – present **Assistant Professor**
3D Geoinformation Group, Faculty of Architecture and the Built Environment, Delft University of Technology. Netherlands
- 2013.5 – 2018.1 **Research scientist**
Visual Computing Center, King Abdullah University of Science and Technology, Kingdom of Saudi Arabia
- 2011.8 – 2013.5 **Associate professor**
Visual Computing Research Center, Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, P.R.China
- 2009.2 – 2011.7 **Assistant professor**
Visual Computing Research Center, Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences, P.R.China

Education

- 2003.8 – 2009.1 **Ph.D. in mechatronics engineering** (Master-Doctor combined program)
Graduate University of the Chinese Academy of Sciences, P.R.China
- 2003.8 – 2004.7 **Postgraduate courses**
Department of Automation,
University of Science and Technology of China, P.R.China
- 1999.9 – 2003.7 **B.Sc. in material science**
Department of Material Science and Technology,
Nanjing University of Aeronautics and Astronautics, P.R.China

Honors and Awards

- 2018 Best Paper Award. International Congress of Chinese Mathematicians (ICCM)
- 2017 Outstanding reviewer. Computers & Graphics
- 2015 Best Paper Award of CAD/Graphics 2015
- 2012 Lu Zengyong CAD&CG High Tech Award (2nd place)

- 2011 K.C.Wong Post-doctoral Fellowship, the Chinese Academy of Sciences
- 2010 Outstanding Research Award, the China National Computer Congress

Funding (as PI)

- 2020 – 2025 AIDU programme (TU Delft's AI, Data and Digitalisation research and education programme). AI lab on 3D Urban Understanding. 530,000 EUR
- 2013 – 2016 National Natural Science Foundation of China (General Program, No. 61272327). Recognition and Understanding of 3D Indoor Scenes. 820,000 RMB
- 2011 – 2013 National Natural Science Foundation of China (Youth Foundation, No. 61003190). Architecture Reconstruction based on Structural Analysis of Point Cloud. 190,000 RMB
- 2011 – 2012 China Postdoctoral Science Foundation (Special Fund, No. 201104146). Urban Recognition and Understanding based on Fusion of Geometry and Image Data. 100,000 RMB
- 2011 – 2012 Shenzhen Science and Technology Foundation (No. JC201005270340A). Theories and Techniques for High Precision and Efficient Urban Architecture Reconstruction from Point Cloud. 100,000 RMB

Professional Activities

Program committee member

- o AI3D (2019, 2020)
- o CVPR (2018)
- o CAD/Graphics (2017, 2019)
- o ACCV (2014, 2016)
- o ACM SIGGRAPH Asia Technical Briefs & Posters (2013, 2014, 2015, 2016)

Editorial board member (associate editor)

- 2013.7 – 2016.12 Frontiers of Computer Science (Youth AE)

Reviewer

Conferences SIGGRAPH, SIGGRAPH Asia, CVPR, ACCV, Eurographics, Pacific Graphics, Graphics Interface, Computational Visual Media Conference

Journals ACM Transactions on Graphics, IEEE Transactions on Visualization and Computer Graphics, Computer Graphics Forum, The Visual Computer, Computers & Graphics, ACM Journal on Computing and Cultural Heritage, IEEE Transactions on Geoscience and Remote Sensing, ISPRS Journal of Photogrammetry and Remote Sensing, Computer Animation and Virtual Worlds, Pattern Recognition Letters, Frontiers of Computer Science, Integrated Computer Aided Engineering, International Journal of Recent Patents on Mechanical Engineering

Grants National Natural Science Foundation of China (2013, 2014, 2015), Swiss National Science Foundation (2012), Guangdong Natural Science Foundation (2012)

Research visits

- 2019.8 – 2019.8 Vexcel Imaging, Graz, Austria. Dr. Michael Gruber
- 2012.12 – 2013.1 Dept. Computer Science, Ben-Gurion University, Israel. Prof. Andrei Sharf

2011.12 – 2012.1 Dept. Computer Science, Ben-Gurion University, Israel. Prof. Andrei Sharf

Associations

- 2011 – 2018 Geometric Design & Computing Committee of the China Society for Industrial and Applied Mathematics
- 2010 – 2018 Member of the ACM, IEEE

Teaching and Supervision

Teaching

- GEO1001 Sensing Technologies and Mathematics for Geomatics, Faculty of Architecture and the Built Environment, TU Delft (Fall 2020)
- GEO1016 Photogrammetry and 3D computer vision, Faculty of Architecture and the Built Environment, TU Delft (Spring 2020)
- GEO1101 Synthesis project, Faculty of Architecture and the Built Environment, TU Delft (Spring 2019)
- GEO1004 3D modelling of the built environment. Computer, Faculty of Architecture and the Built Environment, TU Delft (Spring 2018, Spring 2019)
- Fall 2015 Computer Graphics, Teaching assistant. Computer, Electrical and Mathematical Sciences & Engineering, KAUST

Supervision

- Shenglan Du PhD (with Prof. Jantien Stoter). Faculty of Architecture and the Built Environment, TU Delft
- Jin Huang PhD (with Prof. Jantien Stoter). Faculty of Architecture and the Built Environment, TU Delft
- Zexin Yang Visiting PhD of Prof. Xiaojun Cheng. College of Surveying and Geo-Informatics, Tongji University
- Weixiao Gao PhD (with Prof. Hugo Ledoux). Faculty of Architecture and the Built Environment, TU Delft
- Pantelis Kaniouras 2020. MSc. Faculty of Architecture and the Built Environment, TU Delft
- Chirag Garg 2020. MSc. Faculty of Architecture and the Built Environment, TU Delft
- Yifang Zhao 2020. MSc. Faculty of Architecture and the Built Environment, TU Delft
- Yabin Xu 2019. Visiting PhD of Prof. Jun Wang. College of Mechanical and Electrical Engineering, NUAU
- Vasileios Bouzas 2019. MSc. Faculty of Architecture and the Built Environment, TU Delft
- Nikolaos Tzounakos 2019. MSc. Faculty of Architecture and the Built Environment, TU Delft
- Shenglan Du 2019. MSc. Faculty of Architecture and the Built Environment, TU Delft
- Songlin Chen 2016. PhD student of Prof. Jibin Zhao. Shenyang Institute of Automation, Chinese Academy of Sciences
- Feilong Yan 2016. Postdoc of Prof. Peter Wonka. King Abdullah University of Science and Technology

- Yuanhao Cao 2015. Postdoc of Prof. Peter Wonka. King Abdullah University of Science and Technology
- Minglei Li 2015. PhD student of Prof. Shaochuang Liu. Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences
- Haiyong Jiang 2015. PhD student of Prof. Xiaopeng Zhang. Institute of Automation, Chinese Academy of Sciences
- Ke Xie 2013. PhD student of Prof. Baoquan Chen. Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences

Patents

- [11] PCT Patent: Method for Reconstruction of Urban Scenes.
Baoquan Chen, **Liangliang Nan**, Qian Zheng. Publication No.: WO2012/012943 A1, Publication date: Feb. 2, 2012. Application No.: PCT/CN2010/007552, Filing date: Jul. 28, 2010
- [10] PCT Patent: Point Cloud Skeleton Extraction Method and Apparatus.
Hui Huang, Shihao Wu, Baoquan Chen, **Liangliang Nan**. Publication No.: WO2014187046 A1, Publication date: Nov. 27, 2014. Application No.: PCT/CN2013/083441. Filing date: Sept. 13, 2013
- [9] U.S. Patent: Method for Reconstruction of Urban Scenes.
Baoquan Chen, **Liangliang Nan**, Qian Zheng. Patent No.: US 08718393 B2, Date of Patent: May 6, 2014. Application No.: US12/935685, Application date: Jul. 28, 2010
- [8] U.S. Patent: Method and Device for Extracting Skeleton from Point Cloud.
Hui Huang, Shihao Wu, Baoquan Chen, **Liangliang Nan**. Publication No.: US20160203636 A1, Publication date: Jul. 14, 2016. Application No.: US 14/378976. Filing date: Sept. 13, 2013
- [7] Chinese Patent: Method for Symmetrization of Facade Layouts.
Haiyong Jiang, Dong-Ming Yan, Weiming Dong, **Liangliang Nan**, Fuzhang Wu, Jianwei Guo, Xiaopeng Zhang. Publication No.: CN105678031A, Publication date: Jun. 15, 2016. Application No.: 2016101224206, Filing date: Mar. 4, 2016
- [6] Chinese Patent: Method and System for Plant Growth Modeling.
Zhanglin Cheng, Hui Huang, Daniel Cohen-Or, **Liangliang Nan**. Publication No.: CN103745497A, Publication date: Apr. 23, 2014. Application No.: 2013106758314. Filing date: Dec. 11, 2013
- [5] Chinese Patent: Method and Apparatus for Point Cloud Skeleton Extraction.
Hui Huang, Shihao Wu, Baoquan Chen, **Liangliang Nan**. Publication No.: CN103268631A, Publication date: Aug. 28, 2013. Application No.: 2013101962432, Filing date: May. 23, 2013
- [4] Chinese Patent: Method and System for 3D Audio-Visual Display for Elevators.
Wenqun Xiu, Shengzhong Feng, **Liangliang Nan**, Baoyun Zhang. Publication No.: CN103903585A, Publication date: Jul. 2, 2014. Application number: 201210568045X. Filing Date: Dec. 24, 2012
- [3] Chinese Patent: Method and Apparatus for Point Cloud Optimization.
Hui Huang, Shihao Wu, **Liangliang Nan**, Baoquan Chen. Publication No.: CN103065354A, Publication date: Apr. 24, 2013. Application No.: 2012105670585, Filing Date: Dec. 14, 2012
- [2] Chinese Patent: Method and System for Classification and Reconstruction of Indoor Scenes.
Liangliang Nan, Ke Xie, Hui Huang, Baoquan Chen. Publication No.: CN102945567B, Publication Date: Jun. 15, 2016 Application No.: 201210401274.2, Filing Date: Oct. 22, 2012

- [1] Chinese Patent: Method and System for Reconstruction of 3D Architecture Models.
Liangliang Nan, Baoquan Chen, Zhanglin Cheng. Patent No.: ZL201010220298.9, Date Issued: Jul. 4, 2012

Publications

- [25] Guangpeng Fan, **Liangliang Nan**, Feixiang Chen, Yanqi Dong, Zhiming Wang, Hao Li, and Danyu Chen. A New Quantitative Approach to Tree Attributes Estimation Based on LiDAR Point Clouds. *Remote Sensing*. 12(11), 1779, 2020
- [24] Songlin Chen, **Liangliang Nan**, Renbo Xia, Jibin Zhao, and Peter Wonka. PLADE: A Plane-based Descriptor for Point Cloud Registration with Small Overlap. *IEEE Transactions on Geoscience and Remote Sensing*. 58(4), 2530-2540, 2020
- [23] Shenglan Du, Roderik Lindenbergh, Hugo Ledoux, Jantien Stoter, **Liangliang Nan**. AdTree: Accurate, Detailed, and Automatic Modelling of Laser-Scanned Trees. *Remote Sensing*. 11(18), 2074, 2019
- [22] Yisong Gao, Lifang Wu, Dong-Ming Yan, **Liangliang Nan**. Near Support-free Multi-directional 3D Printing via Global-optimal Decomposition. *Graphical Models*. Volume 104, 101034, July 2019
- [21] **Liangliang Nan** and Peter Wonka. PolyFit: Polygonal Surface Reconstruction from Point Clouds. *ICCV 2017*
- [20] Feilong Yan, **Liangliang Nan**, Peter Wonka. Block Assembly for Global Registration of Building Scans. *ACM Transactions on Graphics*, Vol.35, No.6, Nov. 2016 (*ACM SIGGRAPH Asia 2016*)
- [19] Minglei Li, Peter Wonka, **Liangliang Nan**. Manhattan-world Urban Reconstruction from Point Clouds. *Lecture Notes in Computer Science*, Vol. 9908, pp. 54-69, Sept. 2016 (*ECCV 2016*)
- [18] Lama Affara, **Liangliang Nan**, Bernard Ghanem, Peter Wonka. Large Scale Asset Extraction for Urban Images. *Lecture Notes in Computer Science*, Vol. 9907, pp. 437-452, Sept. 2016 (*ECCV 2016*)
- [17] Yuanhao Cao, **Liangliang Nan**, Peter Wonka. Curve Networks for Surface Reconstruction. *arXiv: 1603.08753 [cs.GR]*, Mar. 2016
- [16] Minglei Li, **Liangliang Nan**, Shaochuang Liu. Fitting Boxes to Manhattan Scenes Using Linear Integer Programming. *International Journal of Digital Earth*, Vol. 9, No. 8, pp. 806-817, Feb. 2016
- [15] Haiyong Jiang, Dong-Ming Yan, Weiming Dong, Fuzhang Wu, **Liangliang Nan**, Xiaopeng Zhang. Symmetrization of Facade Layouts. *Graphical Models*, Vol. 85, pp. 11-21, Feb. 2016 (*Computational Visual Media 2016*)
- [14] Haiyong Jiang, **Liangliang Nan**, Dong-Ming Yan, Weiming Dong, Xiaopeng Zhang, Peter Wonka. Automatic Constraint Detection for 2D Layout Regularization. *IEEE Transactions on Visualization and Computer Graphics*, Vol. 22, No. 8, pp. 1933-1944, Aug. 2016
- [13] Minglei Li, **Liangliang Nan**, Neil Smith, Peter Wonka. Reconstructing Building Mass Models from UAV Images. *Computers & Graphics*, Vol. 54, pp. 84-93, Aug. 2016 (*CAD/Graphics 2015*) ([Best Paper Award](#))
- [12] **Liangliang Nan**, Caigui Jiang, Bernard Ghanem, Peter Wonka. Template Assembly for Detailed Urban Reconstruction. *Computer Graphics Forum*, Vol. 34, No. 2, May. 2015 (*EUROGRAPHICS 2015*)
- [11] **Liangliang Nan**, Andrei Sharf, Baoquan Chen. 2D-3D Lifting for Shape Reconstruction. *Computer Graphics Forum*, Vol. 33, No. 7, Oct. 2014 (*Pacific Graphics 2014*)

- [10] **Liangliang Nan**, Ke Xie, Andrei Sharf. A Search-Classify Approach for Cluttered Indoor Scene Understanding. *ACM Transactions on Graphics*, Vol. 31, No. 6, Dec. 2012 (*ACM SIGGRAPH Asia 2012*)
- [9] **Liangliang Nan**, Andrei Sharf, Ke Xie, Tien-Tsin Wong, Oliver Deussen, Daniel Cohen-Or, Baoquan Chen. Conjoining Gestalt Rules for Abstraction of Architectural Drawings. *ACM Transactions on Graphics*, Vol. 30, No. 6, Dec. 2011 (*ACM SIGGRAPH Asia 2011*)
- [8] **Liangliang Nan**, Andrei Sharf, Hao Zhang, Daniel Cohen-Or, Baoquan Chen. SmartBoxes for Interactive Urban Reconstruction. *ACM Transactions on Graphics*, Vol. 29, No. 4, Jul. 2010 (*ACM SIGGRAPH 2010*)
- [7] **Liangliang Nan** and Weijun Liu. Silhouette-based Interactive Editing for Mesh Models. *CAD/CG 2010 (in Chinese)*, pp. 755-764, Jul. 2010
- [6] **Liangliang Nan**, Weijun Liu and Kai Zhang. Laser Remanufacturing Based on the Integration of Reverse Engineering and Laser Cladding. *International Journal of Computer Applications in Technology*. Vol. 37, No. 2, pp. 116-124, 2010
- [5] **Liangliang Nan** and Baoquan Chen. Recent Advances in Point Cloud Reconstruction. *Bulletin of Advanced Technology Research (in Chinese)*. Vol. 3, No. 6, pp. 45-49, 2009
- [4] Shujuan Jiang, Weijun Liu and **Liangliang Nan**. Laser Cladding Height Prediction Based on Neural Network. *Journal of Mechanical Engineering (in Chinese)*. Vol. 45, No. 3, pp. 269-274. 2009
- [3] **Liangliang Nan** and Weijun Liu. Three Dimensional Measuring and Data Processing in Reverse Engineering. *Chinese Journal of Scientific Instrument (in Chinese)*. Vol. 28, No. 4, pp. 53-55, 2007
- [2] **Liangliang Nan** and Weijun Liu. Sensing and Control for Geometry Stability of the Melt Pool and the Cross Sectional Area in Laser Cladding. *Proceedings of the International Conference on Innovative Computing, Information and Control*, Vol. 1, pp. 521-524, Aug. 2006
- [1] **Liangliang Nan**, Weijun Liu and Kai Zhang. Modeling for Laser-Material Interaction to Predict and Control the Cross Sectional Area of Coaxial Laser Cladding with Powder. *Proceedings of the International conference on Advanced Design and Manufacture*, pp. 386-390, Jan. 2006