

# Ningna Wang

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## Research Interests

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My research interests broadly lie in **computer graphics, geometry processing, and 3D shape analysis**. My current research direction focuses on **3D medial axis** computation and its applications. I aim to explore new representations and algorithms to process geometric data more efficiently and effectively. Additionally, I am also interested in exploring **aerial path planning** for 3D urban scene reconstruction.

## Education

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Ph.D. in Computer Science	<b>University of Texas at Dallas</b>   <i>Dallas, Texas, USA</i>	2019 - 2025 (Expected)
M.S. in Computer Science	<b>Carnegie Mellon University</b>   <i>Pittsburgh, PA, USA</i>	2014 - 2016
B.S. in Computational Mathematics	<b>Jilin University</b>   <i>Changchun, Jilin, China</i>	2010 - 2014

## Publications

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- [1] MATTopo: Topology-preserving Medial Axis Transform with Restricted Power Diagram [**Journal Track**]  
**Ningna Wang**, Hui Huang, Shibo Song, Bin Wang, Wenping Wang, Xiaohu Guo  
*to appear in ACM Transactions on Graphics (Proc. of SIGGRAPH Asia)* (2024). ACM New York, NY, USA, 2024
- [2] NASM: Neural Anisotropic Surface Meshing [**Conference Track**]  
Hongbo Li, Haikuan Zhu, Sikai Zhong, **Ningna Wang**, Cheng Lin, Xiaohu Guo, Shiqing Xin, Wenping Wang, Jing Hua, Zichun Zhong  
*to appear in ACM Transactions on Graphics (TOG/SIGGRAPH Asia)* (2024). ACM New York, NY, USA, 2024
- [3] CWF: Consolidating Weak Features in High-quality Mesh Simplification [**Journal Track**]  
Rui Xu, Longdu Liu, **Ningna Wang**, SM Chen, Shiqing Xin, Xiaohu Guo, Zichun Zhong, Taku Komura, Wenping Wang, Changhe Tu  
*ACM Transactions on Graphics (Proc. of SIGGRAPH)* 43.4 (2024). ACM New York, NY, USA, 2024
- [4] Globally Consistent Normal Orientation for Point Clouds by Regularizing the Winding-Number Field [**Best Paper Award**]  
Rui Xu, Zhiyang Dou, **Ningna Wang**, Shiqing Xin, Shuangmin Chen, Mingyan Jiang, Xiaohu Guo, Wenping Wang, Changhe Tu  
*ACM Transactions on Graphics (Proc. of SIGGRAPH)* (2023). ACM New York, NY, USA, 2023
- [5] S3DS: Self-supervised Learning of 3D Skeletons from Single View Images  
Jianwei Hu, **Ningna Wang**, Baorong Yang, Gang Chen, Xiaohu Guo, Bin Wang  
*ACM International Conference on Multimedia (ACM MM)* (2023). 2023
- [6] Point2MM: Learning medial mesh from point clouds  
Mengyuan Ge, Junfeng Yao, Zhonggui Chen, Baorong Yang, **Ningna Wang**, Xiaohu Guo  
*Computers & Graphics (Proceedings of CAD/Graphics)* (2023). 2023
- [7] Computing Medial Axis Transform with Feature Preservation via Restricted Power Diagram [**Journal Track**]  
**Ningna Wang**, Bin Wang, Wenping Wang, Xiaohu Guo  
*ACM Transactions on Graphics (Proc. of SIGGRAPH Asia)* 41.6 (2022) pp. 1–18. ACM New York, NY, USA, 2022
- [8] IMMAT: Mesh reconstruction from single view images by medial axis transform prediction  
Jianwei Hu, Gang Chen, Baorong Yang, **Ningna Wang**, Xiaohu Guo, Bin Wang  
*Computer-Aided Design (CAD)* 150 (2022) p. 103304. Elsevier, 2022
- [9] A method of realistic leaves modeling based on point cloud  
Yinghui Wang, Wen Hao, Gang Wang, Xiaojuan Ning, Jing Tang, Zhenghao Shi, **Ningna Wang**, Minghua Zhao  
*Proceedings of the 12th ACM SIGGRAPH International Conference on Virtual-Reality Continuum and Its Applications in Industry*, 2013

## Invited Talks

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### Computing Medial Axis Transform with Feature Preservation via Restricted Power Diagram

ACM SIGGRAPH ASIA 2022

Center for Digital Media Computing, Xiamen University

*Daegu, South Korea, Dec 2022*

*Online, Nov 2022*

### MATTopo: Topology-preserving Medial Axis Transform with Restricted Power Diagram

Visual Computing Research Center, Shenzhen University

Center for Digital Media Computing, Xiamen University

*Shenzhen, China, Nov 2023*

*Online, Jan 2024*

## Work Experience

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### Department of Computer Science, University of Texas at Dallas

Dallas, Texas, USA

Research Assistant | Advisor: Dr. Xiaohu Guo

Aug 2019 - Present

- Developed a complete framework for computing the medial axis of 3D CAD meshes with **sharp-features preservation**.
- Developed a novel **topology-preserving** 3D medial axis computation framework based on volumetric restricted power diagram (RPD).
- Researched on new **learning-based methods** for mesh reconstruction via 3D skeleton prediction from **single view images** or **point clouds**.
- Developed a new method for estimating **globally consistent normal orientations** for a raw point cloud.
- Studied a smooth **mesh simplification** functional that simultaneously consolidates weak features in a high-quality mesh.

Teaching Assistant

2021, 2022, 2024

- Built starter code for all course projects in **UTD CS6323 Computer Animation and Gaming** and **CS6366 Computer Graphics**.
- Held office hours and graded homework for graphics-related courses.

### Shenzhen University

Shenzhen, Guangdong, China

Research Intern | Advisor: Dr. Hui Huang

Oct 2023 - Dec 2023

- Conducted research on **aerial path planning** for drone trajectory and image capturing, efficiently yielding high-quality 3D scene reconstructions with maximum scene information and minimum flying cost.

### Booking.com B.V.

Amsterdam, Netherlands

Senior Software Engineer

Nov. 2018 - July 2019

Core Software Engineer

Aug. 2017 - Nov. 2018

- [System Design and Development] Responsible for the design, development, and continued operation of the **hotel availability search system**, which handles thousands of incoming hotel search requests per second.
- [Production Infrastructure Optimization] Significantly enhanced system stability and scalability by distributing hotel availabilities using **jump consistent hashing**, a fast consistent hash algorithm with no storage and minimal memory requirements.
- [Cross-Functional Collaboration] Collaborated seamlessly with product-side engineers and partner-side engineers to ensure the successful development and delivery of the search system.

### The Priceline Group Inc.

Amsterdam, Netherlands | Seattle, WA, USA

Graduate Software Engineer

Aug. 2016 - Aug. 2017

- [System Design] Developed a **hotel inventory management system** with a wealth of features, including property listing, yield management, and revenue analytics.
- [Feature Optimization] Implemented and experimented new features for the **Genius loyalty program** for various discounts and travel rewards.

## Awards

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2024	<b>First Place CAST STAR Award (1/16 teams)</b> , CAST-STEM Bridge Summer Camp	USA
2023	<b>Best Paper Award</b> , SIGGRAPH 2023	USA
2013	<b>Honorable Mention</b> , Mathematical Contest in Modeling (MCM)	USA
2011	<b>First Prize Scholarship &amp; Outstanding Student</b> , Jilin University (2011-2013)	China
2010	<b>Second Prize Scholarship &amp; Outstanding Student</b> , Jilin University	China

## Review Service

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Conference	ACM SIGGRAPH   ACM SIGGRAPH Asia	2024
Conference	International Conference on Geometric Modeling and Processing (GMP)	2024
Conference	Pacific Graphics IPC	2023
Journal	Graphical Models	2024
Journal	IEEE Transactions on Visualization and Computer Graphics (TVCG)	2022

## Teaching

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Teaching Assistant	UTD CS4361/CS6366 Computer Graphics	2024 Fall, 2021 Spring
Teaching Assistant	UTD Clark Summer Research Program	2024 Summer
Teaching Assistant	CAST-STEM Bridge Summer Camp	2024 Summer
Teaching Assistant	UTD CS6323 Computer Animation and Gaming	2022 Fall
Teaching Assistant	UTD CS4347 Database Systems	2022 Fall, 2021 Spring
Teaching Assistant	UTD CS6334 Virtual Reality	2020 Spring
Teaching Assistant	UTD CS4332 Introduction to Programming Video Games	2019 Fall