

# Ningna /nin-na/ Wang /wɒŋ/

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## Summary

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

Ph.D. in Computer Science	University of Texas at Dallas   Dallas, Texas, USA	2019 - Present
M.S. in Computer Science	Carnegie Mellon University   Pittsburgh, PA, USA	2014 - 2016
B.S. in Computational Mathematics	Jilin University   Changchun, Jilin, China	2010 - 2014

## Publications

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

**Ningna Wang**, Hui Huang, Shibo Song, Bin Wang, Wenping Wang, Xiaohu Guo  
In Submission (2024). 2024

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

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

S3DS: Self-supervised Learning of 3D Skeletons from Single View Images

Jianwei Hu, **Ningna Wang**, Baorong Yang, Gang Chen, Xiaohu Guo, Bin Wang  
to appear in ACM International Conference on Multimedia (ACM MM) (2023). 2023

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

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

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

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

## Work Experience

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

2020, 2021, 2022

- 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

Research Intern | Advisor: Dr. Hui Huang

- 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.

Shenzhen, Guangdong, China

Oct-Dec 2023

Booking.com B.V.

Senior Software Engineer

Core Software Engineer

- [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.

Amsterdam, Netherlands

Nov. 2018 - July 2019

Aug. 2017 - Nov. 2018

The Priceline Group Inc.

Graduate Software Engineer

- [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.

Amsterdam, Netherlands | Seattle, WA, USA

Aug. 2016 - Aug. 2017

Review Service

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

Teaching Assistant	UTD Clark Summer Research Program	2024 Summer
Teaching Assistant	CAST-STEM Bridge Summer Camp	2024 Summer
	<ul style="list-style-type: none"><li>Supervised a team of nine high school students on a 3D talking face project.</li><li>Lectured on basic concepts of deep learning and artificial intelligence, including CNNs, Autoencoders, VAEs, and Diffusion models.</li></ul>	
Teaching Assistant	UTD CS6323 Computer Animation and Gaming	2022 Fall
Teaching Assistant	UTD CS6366 Computer Graphics	2021 Spring
Teaching Assistant	UTD CS6334 Virtual Reality	2020 Spring
Teaching Assistant	UTD CS4347 Database Systems	2021 Spring, 2022 Fall
Teaching Assistant	UTD CS4332 Introduction to Programming Video Games	2019 Fall

Invited Talks

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

Skills

Programming

Technologies

Tools

C++, Java, Python,  $\LaTeX$ , Markdown

OpenGL, Git, CMake, Eigen, CGAL, Geogram, libigl

Linux/Unix, Shell (Bash/Zsh), VIM, Blender, Adobe Illustrator, Final Cut Pro