Ningna Wang

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Research Interests

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, **3D reconstruction** and **3D meshing**. Additionally, I am also interested in exploring **aerial path planning** for 3D urban scene reconstruction and **generative 3D shape synthesis**. I am honored to have received the **SIGGRAPH Best Paper Award** in 2023.

Education

Ph.D. in Computer Science	**University of Texas at Dallas** | *Dallas, Texas, USA*	*2019 - 2025 (Expected)*
M.S. in Computer Science	**Carnegie Mellon University** | *Pittsburgh, PA, USA*	*2014 - 2016*
B.S. in Computationl Mathematics	**Jilin University** | *Changchun, Jilin, China*	*2010 - 2014*

Publications

[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

Awards

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

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 — *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.

Invited Talks

Computing Medial Axis Transform with Feature Preservation via Restricted Power Diagram

ACM SIGGRAPH ASIA 2022 — *Daegu, South Korea, Dec 2022*

Center for Digital Media Computing, Xiamen University — *Online, Nov 2022*

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

Visual Computing Research Center, Shenzhen University — *Shenzhen, China, Nov 2023*

Center for Digital Media Computing, Xiamen University — *Online, Jan 2024*

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 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*