Siqi Wang

Contact info

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Google Scholar: https://scholar.google.com/citations?user=mC4US5IAAAAJ&hl=en&oi=ao

Education

New York University   New York, USA
Ph.D. in Computer Science (GPA: 3.91/4.0)   2019–2025

- Research Interests: Computer Graphics, Geometry Processing, Physical Simulations.
- Advisors: Prof. Daniele Panozzo, Denis Zorin.

Shanghai Jiao Tong University   Shanghai, CN
Bachelor of Engineering in Electrical Engineering (GPA: 3.7/4.0)   2015–2019

- Graduate with Outstanding Honor in Shanghai (Top 5%)

National University of Singapore   Singapore, SG
Exchange Program of 2017/18 SEM1 (GPA: 4.7/5.0)   2017–2017

- Inbound Scholar of TFI LEaRN Programme (50 Asiawide)

Publications

[1] Chenxi Liu, **Siqi Wang**, Matthew Fisher, Deepali Aneja, and Alec Jacobson, "2D Neural Fields with Learned Discontinuities", *Eurographics*, 2025.

[2] **Siqi Wang**, Chenxi Liu, Daniele Panozzo, Denis Zorin, and Alec Jacobson, "Bézier Spline Simplification Using Locally Integrated Error Metrics", in *SIGGRAPH Asia 2023 Conference Papers*, 2023, pp. 1–11.

[3] Ruibo Liu, Qijia Shao, **Siqi Wang**, Christina Ru, Devin Balkcom, and Xia Zhou, "Computational fabrics for monitoring human joint motion", *US Patent App. 16/911,877*, Dec. 2020.

[4] Chelsea Tymms, **Siqi Wang**, and Denis Zorin, "Appearance-preserving Tactile Optimization", *ACM Transactions on Graphics (TOG)*, vol. 39, no. 6, pp. 1–16, 2020.

[5] Yuwei Xiao, Szeyu Chan, **Siqi Wang**, Bo Zhu, and Xubo Yang, "An Adaptive Staggered-tilted Grid for Incompressible Flow Simulation", *ACM Transactions on Graphics (TOG)*, vol. 39, no. 6, pp. 1–15, 2020.

[6] Ruibo Liu, Qijia Shao, **Siqi Wang**, Christina Ru, Devin Balkcom, and Xia Zhou, "Reconstructing Human Joint Motion with Computational Fabrics", *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT)*, vol. 3, no. 1, pp. 1–26, 2019.

WORK EXPERIENCE

Roblox Corporation   San Mateo, CA, USA
Research Intern, Engine Group (Geometry)   May–Aug 2024

- Designed a novel algorithm to automatically segment solids and shells from triangle soups.
- Experimented and implemented methods for robust hole filling with mesh/texture preservation.
- Developed the entire pipeline to automatically repair nonmanifold, nonwatertight meshes in Roblox Studio in a physically meaningful way.

Adobe Research   San Jose, CA, USA
Research Scientist Intern, Graphics (2D&3D), BIG Lab   May–Dec 2022

- Developed a novel technique for simplifying Bézier splines while preserving high visual fidelity. This approach demonstrates significant quantitative improvements over existing methods and can be effectively used to produce temporally-coherent vector graphics animations, resulting in a top-tier conference paper publication and a filed patent.
- Won the Code Quality Champion (Best Project in C++) in Adobe Code Quality Jam 2022.

RESEARCH EXPERIENCE

New York University   NY, USA
Research Assistant, Geometric Computing Lab   2019–2025

- **Functional curve design and optimization Toolkit on 3D surfaces (Submitting)**
- Design, parameterize and optimize the shape and placement of magnetic resonance imaging (MRI) coils or soft sensors/actuators on human body in order to acquire higher signal-to-noise ratio (SNR) for medical imaging, or better reconstruction accuracy for gestures, or other physical simulation objective.
- **A posteriori hp adaptive FEM solver for physical simulations**
- We propose a general pipeline to increase the accuracy of physical simulations in the most efficient way, which means to minimize running time to achieve given error, or minimize error for given time. We demonstrate experimentally which hp a posteriori method is the best in terms of the overall performance and how much benefit we derive from it vs simpler options. Moreover, we also take into consideration the factor in the geometric contribution to the error estimates explicitly.
- **Bézier spline simplification using locally integrated error metrics**
- Inspired by surface mesh simplification methods, we present a technique for reducing the number of Bézier curves in a vector graphics while maintaining high fidelity. The generality of our method allows us to show results for curves with varying thickness and for vector graphics animations.
- **Appearance-preserving tactile optimization**
- We propose an optimization method to independently control the tactile properties and visual appearance of a texture. Optimization is enabled by neural network-based models (conditional GANs) and allows the creation of textures with a desired tactile feeling while preserving a desired visual appearance at a relatively low computational cost.

Shanghai Jiao Tong University   Shanghai, CN
Research Assistant, Digital Augmented Reality Tech Laboratory   Oct 2018–May 2019

- **An adaptive staggered-tilted grid for incompressible flow simulation**
- The key mechanics underpinning our new grid structure is to allow the emergence of a new set of tilted grid cells from the nodal positions on a background uniform grid. Our grid structure preserves the computational merits of a uniform Cartesian grid, including the cache-coherent data layout, the easiness for parallelization, and the existence of high-performance numerical solvers. It can also be integrated into other adaptive grid structures, such as an Octree or a sparsely populated grid, to accommodate the T-junction-free hierarchy.

Dartmouth College NH, USA
Research Intern, Dartmouth Networking and Ubiquitous Systems Lab Jul–Oct 2018

– **Reconstructing human-joint motion with computational fabrics**
– The work featured in NSF "4 Awesome Discoveries You Probably Didn't Hear About This Week"
– This work focuses on the primary use of conductive stretchable fabrics to sense the skin deformation during joint motion and infer the joint rotational angle. Experiments with ten participants show 9.69° mean angular error in tracking joint angle and its sensing robustness across users and activities.

OTHER PROJECTS

Cross-view Semantic Segmentation and Road Map Prediction
Course: CSCI-GA.2572 *Deep Learning* by Prof. Yann LeCun Spring 2020

– Our encoder module is a simplified version of ResNet-18. The transformer is an architecture of multi-layer perceptron, which converts 6 first-sight view features to a top-down view feature. The decoder uses pyramid pooling module to generate the road layout with different pixels tagged with different categories.
– Pseudo-label in a fine-tuning phase to utilize the unlabeled data and attained 0.7081 score on the test set.

Program Repair Methods for Router Code Generation
Course: CSCI-GA.2620 *Networks and Mobile Systems* by Prof. Anirudh Sivaraman Spring 2020

– The all-or-nothing feature of compiling fast packet processing program highly restricts the total number of algorithms implemented in the real router. Thus, we relax the restriction and present three main "repair" methods: program modification based on a modified counterexample-guided inductive synthesis algorithm (MAX-CEGIS), splitting across stages and packet re-circulation.
– The preliminary experiments show that we could let many new programs that both rule-based compiler (Domino) and synthesis-based compiler (Chipmunk) will reject, successfully run in programmable routers.

TEACHING

- **Geometric Modeling** (CSCI-GA.3033-018) Spring 2021
  Teaching Assistant at New York University (https://github.com/danielepanozzo/gp)
  Topics include *surface reconstruction, mesh smoothing and optimization, mesh parametrization, mesh deformation and editing, skeletal animation and skinning, fabrication-aware modeling, etc.*
- **Machine Learning** (CSCI-GA.2565-001) Spring 2022
  Grader at New York University (https://rajeshhr.github.io/ml-2022/)
  Topics include *generalized linear models, graphical models, causal inference, reinforcement learning, etc.*

SKILLS

- **Programming languages:** C/C++, Python, MATLAB, JavaScript, SQL
- **Graphics Library:** Libigl, PolyFEM, OpenGL, CGAL, ParaView
- **Rendering Software:** Blender, Houdini
- **Machine Learning Library:** PyTorch

ACADEMIC EXPERIENCE

- **SIGGRAPH Asia Reviewer** 2024
- **IMWUT Reviewer** 2024

Scholarships and Awards

- WiGRAPH (Women in Computer Graphics Research) Rising Star 2022   2022
- DeepMind Scholarship   2021
- MacCracken Fellowship (New York University)   2019
- Graduate with Outstanding Honor in Shanghai   2019
- Hongyi Scholarship (Undergraduate Research Excellence Scholarship)   2018
- Scholarship of the Temasek Foundation International Leadership Enrichment and Regional Networking Programme (TFI LEaRN)   2017
- First-class Scholarship of Lee Fushou Fund   2017
- Academic Excellence Scholarship, SJTU   2016–2018
- First Prize in the Undergraduate Mathematical Contest in Modeling of China   2016
- Mathematical Contest in Modeling, Honorable Mention   2018
- Award for Outstanding Student Cadres, SJTU   2016
- First Place in High School Students Mathematics Contest in China   2014

Invited Talks

- **Bézier Spline Simplification Using Locally Integrated Error Metrics**   2023
  SIGGRAPH Asia 2023 Sydney
- **Lightning Talk at WiGRAPH Rising Stars Workshop 2023**   2023
  SIGGRAPH 2023 Los Angeles
- **A posteriori hp adaptive FEM solver for physical simulation**   2023
  Capital Graphics 2023
- **Lightning Talk at WiGRAPH Rising Stars Workshop 2022**   2022
  SIGGRAPH 2022 Vancouver
- **Vector Graphics Liquify**   2022
  The University of Toronto's Dynamic Graphics Project (DGP)

Leadership and Activity

- Deputy President of the Associations' Union, SJTU   2017–2018
  Organized a variety of activities for all the associations including SJTU Alumni Day
- Vice President of Microsoft Student Club, SJTU   2017–2018
  Held seminars, lectures and events e.g. Microsoft Penta Hackathon 2016
- Inbound Scholar of TFI LEaRN Programme, NUS   2017
  Presented at the TFI LEaRN Young Asian Leaders Forum