DANYONG ZHAO

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EDUCATION

University of Southern California *August 2014 - December 2021*
Doctor of Philosophy (Master of Science conferred together) Defense date: October 12, 2021
Department of Computer Science
Major in Computer Graphics, advised by Prof. Jernej Barbič

Tsinghua University, China *August 2010 - July 2014*
Bachelor of Engineering Overall GPA: 92/100, Rank 2/100
Department of Computer Science and Technology

WORKING EXPERIENCE

Allegro Labs Inc. (also known as Quilter) Remote in Los Angeles County, CA
Software Engineer, full time *October 2022 - Present*

· Research and develop on intelligent circuit board design.
· Implement innovative algorithms that are scalable to numerous circuit components.

Snap Inc. Santa Monica, CA
Software Engineer, full time *November 2021 - November 2022*

· Computer graphics & vision engineer, improve the image quality and efficiency of avatars and clothes in virtual try on images
· Use constaint-based deformation method to deform a 2D triangular mesh associated with outfits and improved 40% of the image quality for try-on results.
· Use Tensorflow and Keras to train the exraction and segementaion of an avatar from a user's photo.
· Refactor the try-on implementation through parellel optimizations to speed up the users' try-on by 30%.

Forma Technologies Inc. San Francisco, CA
Software Developer Intern, advised by Qianyi Zhou *May 2019 - August 2019*

· The sole owner of the web products for users' virtual try-on and apparel merchant onboard support.

Oculus Research Menlo Park, CA
Software Developer Intern, advised by Tianyang Ma *May 2018 - August 2018*

· Designed an algorithm to render blobs on hand joints, tips and palm of some real-captured hand images, which improved hand tracking accuracy.

Method Studios Santa Monica, CA
Rigging Developer, advised by Jun Satio and Simon Yuen *May 2017 - August 2017*

· Designed a parallelized algorithm to optimize the collision detection computation cost by 20%.
· Designed a Maya plugins to resolve collisions using sliding constraints and projection dynamics.

RESEARCH EXPERIENCE

University of Southern California Los Angeles, CA
Research Assistant, advised by Prof. Jernej Barbič *August 2014 - August 2021*

- **Ergonomic optimization:** Optimize shape of furniture so that human can feel more comfortable to use it.
- **Material optimization:** Optimize parameters of elastic isotropic material so that the simulation results match the experiment of deformation-force curve.
- **Real-time hand tracking:** Use Leap Motion to capture transformations of hand bones and then use skinning method as well as pose-space deformer to render skin of hands. Use static virtual coupling method to filter hand skeleton transformations to avoid self collisions.
- **Path planning:** Designed an algorithm to do path planning for complex geometry, use Oculus Rift 2 to render assembly process and use a haptic device to render guiding force for trainning purposes
- **Fast static friction computation:** Researched fast friction computation to resolve contacts on a 6-DOF haptic device.
- **Space-time integration:** Designed an algorithm to do space-time asynchronous implicit backwards euler integration for solid objects.
- **3D Remesh:** Implemented algorithms to remesh a polygon soup using Delaunay triagulation.

Tsinghua University Beijing, China
Undergraduate Research Assistant, advised by Prof. Kun Xu *February 2013 - July 2014*

- Fit captured lighting data using an anisotropic spherical gaussian function.
- Managed to label sketch graphs and designed an algorithm to match sketch graphs to 3D meshes using machine learning algorithms

The University of Hong Kong Hong Kong
Undergraduate Research Assistant, advised by Prof. Wenping Wang *July 2013 - September 2013*

- Research on centroid Voronoi tessellations and investigate on the minimum triangle interior angle

ACADEMIC AWARDS

USC Annenberg Fellowship Award	2014 - 2018
Tsinghua Excellent Academic Performance Award	2011 - 2013
National Science Foundation Grant	#1422869, #1055035

PUBLICATIONS

ERGOBOSS: Ergonomic Optimization of Body-Supporting Surfaces
Danyong Zhao, Yijing Li, Siddhartha Chaudhuri, Timothy Langlois, Jernej Barbič
IEEE Transactions on Visualization and Computer Graphics 01 (2021): 1-1

Evaluating the Efficiency of Six-DoF Haptic Rendering-Based Virtual Assembly Training
Mianlun Zheng, Danyong Zhao, Jernej Barbič
IEEE Transactions on Haptics, 14(1), 2021

6-DoF Haptic Rendering of Static Coulomb Friction Using Linear Programming
Danyong Zhao,Yijing Li, Jernej Barbič
IEEE Transactions on Haptics 2018, 11(3), 2018.

Asynchronous Implicit Backward Euler Integration
Danyong Zhao,Yijing Li, Jernej Barbič
Symposium on Computer Animation (SCA) 2016, Zurich, Switzerland.

Anisotropic Spherical Gaussians
Kun Xu, Weilun Sun, Zhao Dong, Danyong Zhao, Rundong Wu, Shimin Hu
ACM Transactions on Graphics 32(6), 209:1 - 209:11, 2013. (Proceedings of SIGGRAPH Asia 2013).

PROFESSIONAL ACTIVITIES

Academic Journal & Conference Reviewer

IEEE Transactions on Visualization and Computer Graphics	2018-2020
World Haptics Conference	2021
The Visual Computer	2022, 2023
Visual Informatics	2022

TEACHING EXPERIENCES

Teaching Assistant at University of Southern California

Analysis of Algorithms — Spring 2016, Fall 2020, Summer 2021

- Developing an understanding for the major algorithm design techniques.

Database Systems — Spring 2018, Fall 2018, Spring 2019, Fall 2019, Spring 2020, Spring 2021

- Covers the essential concepts, principles, techniques, and mechanisms for the design, analysis, use, and implementation of computerized database systems.

Computer Animation and Simulation — Spring 2017

- Introduces students to computer animation and related simulation techniques, as applicable to computer games, virtual reality systems, and film special effects.

Computer Graphics — Spring 2015

- An introduction to three-dimensional computer graphics. Students will learn both the theory of 3D computer graphics, and how to program it efficiently using OpenGL.

SELECTED ENGINEERING PROJECTS

Reconstruct triangular & tetrahedral mesh from signed distance field

· Implement marchingcubes to convert a distance field to a high-resolution triangular mesh.
· Implement isosurface method (improved from CGAL) to resample the high-resoulution mesh and get a smooth triangular mesh.
· Implement TetGen algorithm to tetrahedralize a triangular mesh.

Reconstructing 3D meshes from multi-view images in real time

· Construct a 3D geometry from a series of 2D images and silhouettes from different views.
· Use GPU computing to make reconstruction real-time.

Sketch to Mesh

· Extracted 2d geometry information from an SVG format graph and 3D mesh features from Google Sketch.

Weather Forecast App

· Designed an ios app and an ajax-based website to gather weather information.

University Network Search Engine

· Grabbed webpages from Tsinghua University from a small set of "seed" pages.
· Developed a scoring system to search web pages in university based on keywords using Lucene library.

SKILLS

Computer Languages	C/C++, Java, MATLAB, Python, PHP, HTML, Javascript, C#, Swift
Tools & Libraries	OpenGL, Cuda, Oculus SDK, Maya & Plugins, Intel MKL, Intel TBB, OpenMP, OpenMPI, Qt, Git, MySQL, Tensor flow, Keras, PyTorch