Jinta Zheng

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RESEARCH SUMMARY

I am a researcher focused on general rendering with over 8 years of experience, using physically based and real-time techniques to render mathematical spaces, soundscapes, and volumetric datasets. The research has broad applications in XR(VR/AR/MR), gaming, medical imaging, and education.

SKILLS

Research, 3D math, C/C++, OpenXR, Vulkan/OpenGL/OpenGL ES/GLSL, GPU/CUDA, Qt, Mitsuba, Git, Matlab, Python, Abaqus, Irrlicht

EDUCATION

Ph.D. in Computer Science Sep 2017 - Jan 2024

Advisor: Eugene Zhang, Oregon State University, USA

B.E. in Computer Science Sep 2012 - Jul 2016

First Class Graduate, Sichuan University, China

EMPLOYMENTS

Qualcomm, USA | *XR Engineer* 2024 - ~

- XR (Virtual-Reality, Augmented-Reality) Advanced Technologies Team.

Oregon State University | *GRA/GTA* 2017 - 2023

- Led and completed 8+ projects; published research papers in SIGGRAPH ASIA, VIS, TOG, and TVCG.
- Engaged in real-time/physically-based rendering of Euclidean and non-Euclidean geometries. Used techniques such as ray tracing, curved ray tracing, photon mapping, geodesics-based KDTree, and BVH for rendering.
- Developed a quad-tree-based Head-Related Transfer Function for fast spatial audio in VR. Conducted semi-supervised separation of sound sources and designed a generative model for decorative sound textures. Also, involved in the creation of an audio engine utilized in the Unreal Engine.
- Finished and advised high school and graduate students on ray tracing/path tracing, spherical harmonics lighting, shadow mapping, non-shrinkage mesh smoothing, marching squares, and vector field visualization.
- Collaborated with the Oregon Department of Transportation to design, model, and validate the noise creation of tire-rumble stripes.
- Instructed and assisted in the following classes: scientific visualization, computer graphics shaders, assembly language and computer architecture, and analysis of algorithms.

Hong Kong Polytechnic University/Chinese Academy of Sciences | *Research Assistant* 2015 - 2017

- Developed a real-time 3D volumetric data visualization system with interactive transfer function using C++, OpenGL/GLSL, Qt, and CUDA.
- Designed a CUDA-based light scattering/photon mapping inside volumetric data for 3D textures, and OpenGL/GLSL for ray casting with the 3D texture.
- Designed gradient-based/ambient occlusion detail enhancements and multi-resolution volume rendering.

Hwadee, China | *Software Engineer Intern* 5.2015 - 6.2015

- Worked as a full stack developer in Customer Relationship Management software using C++ and QT.

PUBLICATIONS

Journal/Conference/RPT | *Peer-Reviewed*

- **Zheng, J.**, Zhang, E., Zhang, Y. Interactive Design and Optics-Based Visualization of Arbitrary Non-Euclidean Kaleidoscopic Orbifolds. IEEE Transactions on Visualization and Computer Graphics (IEEE Visualization 2023).
- **Zheng, J.**, Zhang, Y. Rumble Strip Design Analysis To Contribute to Low Exterior Noise Using Finite Element Modeling. United States. Department of Transportation. Federal Highway Administration (Oregon. Dept. of Transportation. Research Section, No. FHWA-OR-RD-22-14, 1-110, 2022).

- **Zheng, J.**, Hung, S. H., Hiebel, K., Zhang, Y. Real-time rendering of decorative sound textures for soundscapes. ACM Transactions on Graphics, 39(6), 1-12 (Siggraph Asia 2020).
- **Zheng, J.**, Qin, J., Choi, K. S. Towards Interactive and Realistic Rendering of 3D Fetal Ultrasound via Photon Mapping. In 2017 IEEE International Symposium on Multimedia.
- **Zheng, J.**, Zhang, T., Qin, J. Local detail enhancement for volume rendering under global illumination. In Proceedings of the 24th Pacific Conference on Computer Graphics and Applications: Short Papers, pp. 45-50 (Pacific Graphics 2016).
- Zhang, T., **Zheng, J.**, Yi, Z., Liu, D., Qin, J. Realistic rendering of 3D fetal ultrasound via local ambient occlusion. Journal of Medical Imaging and Health Informatics, 6(7), 1776-1781 (2016).
- Zhang, T., Yi, Z., **Zheng, J.**, Liu, D. C., Pang, W. M., Wang, Q., Qin, J. A clustering-based automatic transfer function design for volume visualization. Mathematical Problems in Engineering (2016).

Manuscripts | *Peer-Reviewed*

- **Zheng, J.**, Stauber, A., Nikitin, A., Zhang, Y. Descriptor Aware Synthesis for Decorative Sound Textures (Siggraph Asia 2021).
- **Zheng, J.**, Qu, B., Zhang, E., Zhang, Y. Interactive Visualization of Planar Euclidean Kaleidoscopic Orbifolds (IEEE VIS 2019, 2020, 2021).

SERVICE & HONORS

Service | *Reviewer & Mentor*

- Graphical Models (GMOD)
- Saturday Academy

Honors | *Awards & Competitions*

- The 1st Prize in the Microsoft Imagine Cup App for Office Challenge, Microsoft (2014)
- The 1st Prize China International Software Design and Application, Sichuan (2014)
- Outstanding Graduates of Sichuan Province(1%); Outstanding Graduates; The 1st, 2nd, 3rd Scholarship; Outstanding Student; Innovative Awards; Outstanding Graduation Project; Outstanding Engineer, Sichuan University (2013-2016)