Qi, Wu

Looking for **Graphics/Machine-Learning** Internship (Summer 2023)

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COMPUTER SCIENCE SKILLS

Programming Languages: C/C++, Python, JavaScript/CSS/HTML, Fortran
Parallel Programming: CUDA, Intel-TBB/ISPC, MPI, OpenMP
Graphics Libraries: OSPRay, OptiX, DriectX-DXR, OpenGL, WebGL
Machine Learning: PyTorch

EDUCATION

University of California - Davis, GPA 4.000
09/2018 – 06/2024 (Expected)
Davis, CA, United States
PhD Candidate in Computer Science

SCI Institute, University of Utah, GPA 3.976
08/2016 – 05/2018
Salt Lake City, UT, United States
Master's in Computing, Graphics & Visualization Track

Hong Kong University of Science and Technology (HKUST), First Class Honor
09/2012 - 06/2016
Hong Kong, China
Bachelor of Science in Physics, Physics & Mathematics Option

Ecole Polytechnique Fédérale de Lausanne (EPFL)
02/2015 - 08/2015
Lausanne, Switzerland
Academic Exchange in Physics

EXPERIENCE

Graduate Research Assistant, University of California - Davis, Kwan-Liu Ma
09/2018 – Present
Davis, California
- Research in the field of expressive visualization, high-fidelity rendering, and machine learning.

Graduate Research Internship, Argonne National Laboratory, Joseph A. Insley & Silvio Rizzi
07/2022 – 12/2022
Chicago, Illinois
- Develop declarative and reactive programming interface in Ascent for in situ visualization.
- Research on distributed neural representation for large-scale interactive volume rendering.

Summer Internship, Intel Corporation, Advanced Rendering Technology Team
07/2021 – 09/2021
Santa Clara, California
- Research on deep-learning-assisted direct storage streaming for real-time rendering.

Summer Internship, Intel Corporation, Advanced Rendering Technology Team
07/2020 – 09/2020
Santa Clara, California
- Research on efficient direct storage streaming for volumetric data.

Summer Internship, Intel Corporation, Software Engineering for Computer Graphics
07/2019 – 09/2019
Hillsboro, Oregon
- SIMD optimizations of the traversal and the scheduling algorithm for hardware ray tracing.

Graduate Research Internship, Argonne National Laboratory, Joseph A. Insley & Silvio Rizzi
07/2018 – 09/2018
Chicago, Illinois
- Develop a CPU rendering system inside the scalable and interactive parallel volume rendering – VL3.
- Develop two remote visualization clients for parallel volume rendering on supercomputer – Theta.

Graduate Research Assistant, University of Utah, Chuck Hansen
12/2016 – 05/2018
Salt Lake City, Utah
- Code modernization for many-core Intel architectures using the OSPRay ray-tracing library.
- Integrate the OSPRay ray-tracing library into the visualization software – Visit.

Capstone Research, Hong Kong University of Science and Technology, Michael Wong
09/2015 – 06/2016
Hong Kong, China
- Statistical analysis of neuron activities during monkey saccades using machine learning techniques.

Summer Student, European Organization for Nuclear Research (CERN), Mathieu Benoit
06/2015 - 08/2015
Geneva, Switzerland
- Develop an auto-optimization program inside ALLPIX, a simulation software for silicon pixel detector.

Undergraduate Research Program, Hong Kong University of Science and Technology, Nian Lin
06/2013 - 12/2014
Hong Kong, China
- Analyze images obtained from low-temperature scanning tunneling microscopy (STM).
- Use STM to measure and manipulate molecular properties and states on single molecular level.
- Implement a Monte Carlo simulation program for supra-molecular self-assembly.

PUBLICATION

- **Wu, Qi**, David Bauer, Michael J. Doyle, and Kwan-Liu Ma "Instant Neural Representation for Interactive Volume Rendering." ArXiv Preprint (2022)
- David Bauer, **Qi Wu**, and Kwan-Liu Ma "FoVolNet: Fast Volume Rendering using Foveated Deep Neural Networks." IEEE Visualization Conference (2022) **Best Paper Honorable Mentions**
- **Qi Wu**, Michael J. Doyle, Kwan-Liu Ma "A Flexible Data Streaming Design for Interactive Visualization of Large-Scale Volume Data."

The Eurographics Symposium on Parallel Graphics and Visualization (2022)

- **Qi Wu**, Tyson Neuroth, Oleg Igouchkine, Konduri Aditya, Jacqueline H. Chen, Kwan-Liu Ma "DIVA: A Declarative and Reactive Language for in situ Visualization." IEEE Large Scale Data Analysis and Visualization Symposium (2020)
- Mengjiao Han, Ingo Wald, Will Usher, **Qi Wu**, Feng Wang, Valerio Pascucci, Charles D. Hansen, Chris R. Johnson. "Ray Tracing Generalized Tube Primitives: Method and Applications." Computer Graphics Forum (2019).
- **Qi Wu**, Will Usher, Steve Petruzza, Sidharth Kumar, Feng Wang, Ingo Wald, Valerio Pascucci, Charles D. Hansen. "VisIt-OSPRay: Toward an Exascale Volume Visualization System." The Eurographics Symposium on Parallel Graphics and Visualization (2018).
- Wang, Feng, Ingo Wald, **Qi Wu**, Will Usher, Chris R. Johnson. "CPU Isosurface Ray Tracing of Adaptive Mesh Refinement Data." IEEE Visualization Conference (2018).
- Guillaume Favelier, Charles Gueunet, Attila Gyulassy, Julien Kitware, Joshua Levine, Jonas Lukasczyk, Daisuke Sakurai, Maxime Soler, Julien Tierny, Will Usher, **Qi Wu**, "Topological data analysis made easy with the Topology ToolKit." IEEE Visualization Conference Tutorial (2018).
- Lin, Tao, **Qi Wu**, Jun Liu, Ziliang Shi, Pei Nian Liu, Nian Lin. "Thermodynamic versus Kinetic Control in Self-Assembly of Zero, One, Quasi-two and Two Dimensional Metal-Organic Coordination Structures." The Journal of Chemical Physics (2015).

PRESENTATIONS
- **IEEE Visualization Conference Tutorial,** "Topological Data Analysis Made Easy with the Topology ToolKit" (2018)
- **University of Utah CCMSC Annual Meeting,** "VisIt-OSPRay: Toward an Exascale Volume Visualization System" (2018)
- **University of Utah CCMSC Annual Meeting,** "Visit-OSPRay: Scalable Volume Rendering on Intel KNL CPUs" (2017)
- **Super Computing Conference University of Utah Booth,** "Volume Rendering with VisIt-OSPRay" (2016)
- **Physical Society of Hong Kong (PSHK) Conference,** "Monte Carlo Simulation for 2D Supramolecular Self-Assembly" (2014)
- **HKUST UROP,** "The effect of metal atoms in the MOFs self-assembly" (2014)

AWARDS
University of Utah Best Data Visualization Project Prize Winner (2016)
First Honor Classification on Graduation (CGA A- and above), HKUST (2016)
Dean's List of HKUST for Academic Excellence (2013 & 2016)
HKUST Ho & Ho Foundation Undergraduate Full Scholarship for 4 Years (2012~2016)
Finalist of Mr. Armin & Mrs. Lillian Kitchell Undergraduate Research Award (2014)

PROJECTS
"NBAstatsVIS": An information visualization tool for basketball player statistics.
"TopoVol": A computational topology guided volume rendering tool.
"qaRay": A distributed CPU path-tracing engine with a Blender plugin.
"DXServer": A scalable multi-client remote volume visualization system.
"OSPRay-PIDX Viewer", A light-weighted client-server parallel volume renderer for large dataset using OSPRay.
"OSPRayTinyLoader", A mesh viewer program using OSPRay + TinyObjLoader as backends.
"TerrainViewer", A real-time interactive program to generate and render procedural terrain
"ImGui TransferFunctionModule", A light weighted ImGui widget for transfer function manipulation.